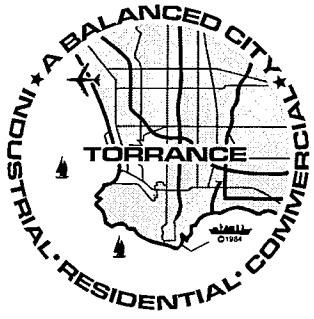
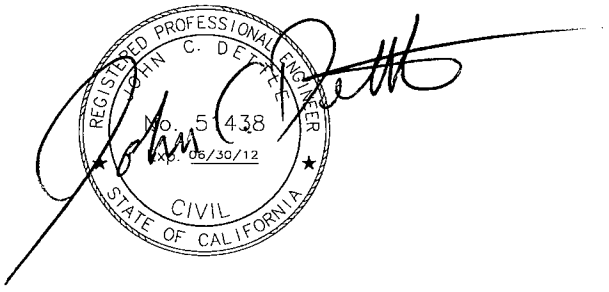
PROPOSAL, SPECIFICATIONS, BOND AND AFFIDAVIT FOR THE CONSTRUCTION OF

WESTERN AVENUE AND ROLLING HILLS ROAD WATER MAIN REPLACEMENT PROJECT, CIP No. I-107 AND RECYCLED WATER RETROFITS FOR ANZA AVENUE MEDIANS AND PARKS PROJECT, CIP No. I-78

B2012-01





John Dettle, P.E.

ENGINEERING MANAGER

JANUARY 2012

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SECTION A

NOTICE INVITING BIDS

CITY OF TORRANCE, CALIFORNIA

NOTICE INVITING BIDS

Notice is hereby given that sealed bids for performing the following described work will be received at the Office of the City Clerk of the City of Torrance, California, **until 2:00 p.m. on Thursday, February 23, 2012,** after which time they will be publicly opened and read at 2:15 p.m. in the Council Chambers of said City:

CONSTRUCTION OF
WESTERN AVENUE AND ROLLING HILLS ROAD
WATER MAIN REPLACEMENT PROJECT, CIP No. I-107 AND
RECYCLED WATER RETROFITS FOR ANZA AVENUE MEDIANS
AND PARKS PROJECT, CIP No. I-78
B2012-01

Plans, Bid Schedule and Specifications are available for viewing and printing by prospective bidders and subcontractors on the City's website at (www.ci.torrance.ca.us)

Those who only view and/or print the Plans, Bid Schedule and Specifications from the City's website will not be added to the City's Plan Holder list for this project.

The official and required form of Proposal must be obtained at the Office of the City Clerk (310) 618-2870, City Hall, 3031 Torrance Boulevard, Torrance, California. There is no cost if picked up at City Hall. A payment of $5 is required if requested by mail. The amount includes tax and is not refundable. A prospective bidder must provide to the City Clerk the firm's name, address, telephone and fax numbers, a contact person and a valid email address. This will ensure that your firm is listed as a "Plan Holder" and that you will be informed of any and all information issued subsequent to obtaining the official form of Proposal. Addenda will be issued only by email and only to those that provide the required information to the City Clerk. Receipt of any Addendum must be acknowledged by a bidder in its submitted form of Proposal.

Full-size 24" x 36" Plans and a bound Specifications booklet may also be obtained at the Office of the City Clerk (310) 618-2870, City Hall, 3031 Torrance Boulevard, Torrance, California upon payment of **$80** if picked up at City Hall, or payment of **$100** if requested by mail. Both amounts include tax. Neither amount is refundable. The payment includes a copy of the official form of Proposal.

If requesting any item(s) by mail, please send check to the following:

CITY OF TORRANCE
OFFICE OF THE CITY CLERK
3031 TORRANCE BLVD
TORRANCE, CA 90509
ATTN: B2012-01

The Engineer's estimate of the Western Avenue and Rolling Hills Road Water Main Replacement Project is between **$1,600,000 and $1,800,000**. The Recycled Water Retrofits for Anza Avenue Medians and Parks Project is between **$190,000 and $220,000.**

All work shall be completed within **130** working days from the date of the Notice to Proceed (NTP).

Per Division 2, Chapter 2 of the Torrance Municipal Code, the Torrance City Council may reject any and all bids, waive any informality or irregularity in such bids, and determine the lowest responsible bidder. No facsimile bids shall be accepted by the City.

Bidders are advised that, as required by federal law, the State has established a statewide overall Disadvantaged Business Enterprise (DBE) goal. To provide assistance in meeting the statewide goal, the Agency is including a DBE availability Advisory of 9% in this contract. Although bidders need not achieve this DBE Availability Advisory as a condition of award, they are encouraged to solicit bids from DBE subcontractors and suppliers.

Substitution of securities for withheld funds is permitted per Section 22300 of the Public Contract Code.

The City has determined that a Class **A** Contractor's license is necessary to bid this project, but reserves the right to accept another Class at the sole discretion of either the Public Works Director or Engineer.

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

The U.S. Department of Transportation (DOT) provides a toll-free "hotline" service to report bid rigging activities. Bid rigging activities can be reported Mondays through Fridays, between 8:00 a.m. and 5:00 p.m., eastern time, Telephone No. 1-800-424-9071. Anyone with knowledge of possible bid rigging, bidder collusion, or other fraudulent activities should use the "hotline" to report these activities. The "hotline" is part of the DOT's continuing effort to identify and investigate highway construction contract fraud and abuse and is operated under the direction of the DOT Inspector General. All information will be treated confidentially and caller anonymity will be respected.

By order of the City Council of the City of Torrance, California.

For further information, please contact Emmanuel Martin, Associate Engineer, in the Public Works Department at 310 618-3069, emartin@TorranceCA.Gov or John Dettle, Engineering Manager, at (310) 618-3059, jdettle@TorranceCA.Gov or via the main office at (310) 781-6900.

SECTION B

INSTRUCTIONS TO BIDDERS

CITY OF TORRANCE, CALIFORNIA

INSTRUCTIONS TO BIDDERS

A. QUALIFICATION OF BIDDERS

1. Competency of Bidders

The Bidder shall be thoroughly competent and capable of satisfactorily performing the Work covered by the Bid. As specified in the Bid Documents, the Bidder shall furnish statements of previous experience on similar work. When requested, the Bidder shall also furnish the plan of procedure proposed; the organization, machinery, plant and other equipment available for the Work; evidence of its financial condition and resources; and any other such documentation as may be required by the City to determine if the Bidder is responsible.

2. Contractor's License

At the time of submitting the Bid, the Bidder shall be licensed as a contractor in accordance with the provisions of Chapter 9, Division 3, of the California Business and Professions Code. The required prime contractor license class for the Work is shown in the project Notice Inviting Bids. However, the City reserves the right to award the Contract to a contractor with another class if the City determines that the license is proper for the work.

B. BIDDER RESPONSIBILITY

A responsible Bidder is a Bidder who has demonstrated the attribute of trustworthiness, as well as ability, fitness, capacity and experience to satisfactorily perform the work.

Bidders are notified that, in accordance with Division 2, Chapter 2 of the Torrance Municipal Code, the City Council may determine whether the Bidder is responsible based on a review of the Bidder's performance on other contracts.

If, based on the provision and criteria in Division 2, Chapter 2 of the Torrance Municipal Code, the Public Works Director proposes not to recommend the award of contract to the apparent low bidder, the Director shall notify the Bidder in writing of its intention to recommend to the City Council that the Council award the contract to the 2nd lowest responsible bidder. If the Bidder presents evidence in rebuttal to the recommendation, the Director shall evaluate the merits of such evidence, and based on that evaluation, make a recommendation to the City Council.

C. ADDENDA TO THE CONTRACT DOCUMENTS

The City may issue Addenda to the Contract Documents during the period of advertising for any reason. The Bidder shall acknowledge the receipt of the Addenda in their Bid. Failure of the Bidder to do so may result in the rejection of the Bid as non-responsive.

D. PREPARATION OF THE BID

1. Examination of Site, Plans and Specifications

Prior to submitting a Bid, the Bidder shall examine the Plans and the Work site, carefully read the Specifications, and satisfy itself that it has the abilities and resources to complete the Work. The Bidder agrees that if it is awarded the Contract, no claim will be made against the City based on ignorance or misunderstanding of the provisions of the Contract Documents, the nature and amount of the work, and the physical and climatic conditions of the work site.

2. Estimated Quantities

The quantities shown in the Bid are approximate only. The Contractor will be paid for the actual quantities of work based on field measurements as provided for in these Specifications. The City reserves the right to increase or decrease the amount of any item or portion of work to be performed or materials furnished, or to delete any item, in accordance with the Specifications.

3. Bid Instructions and Submissions

The Bid shall be submitted on the Bid Proposal forms included with the Specifications. All Bid Documents listed below must be completed, executed and submitted with the Bid by the Bidder.

Required fifteen 9 Bid Proposal Documents:

1) Bidder's Proposal
2) Addenda Acknowledgment Of Addenda Received
3) Contractor's Affidavit
4) Bid Bond (10%)
5) List of Subcontractors
6) References (2 pages)
7) Violations of Federal or State Law
8) Disqualification or Debarment

All prices submitted will be considered as including any and all sales or use taxes.

In the case of discrepancy between unit bid price and total bid, the unit price shall prevail.

4. Disadvantaged Business Enterprise (DBE) Requirements

This project has no DBE requirements.

E. BID BOND

The Bid must be accompanied by either cash, a certified or cashier's check or a surety bond (bid bond) payable to the City of Torrance. Bids must be submitted on the proposal forms furnished by the Public Works Department. The Bid Guaranty shall be in an amount equivalent to at least 10% of the Total Contract Bid Price.

F. NONRESPONSIVE BIDS AND BID REJECTION

1. A Bid in which any one (1) of the required sixteen (9) Bid proposal documents are not completed, executed and submitted may be considered non-responsive and be rejected.

2. A Bid in which the Contract Unit Prices are unbalanced, which is incomplete or which shows alteration of form or irregularities of any kind, or which contains any additions or conditional or alternate Bids that are not called for, may be considered non-responsive and be rejected.

G. AWARD OF CONTRACT

In accordance with Division 2, Chapter 2 of the Torrance Municipal Code, the City Council reserves the right to reject any and all bids received, to take all bids under advisement for a period not-to-exceed sixty (60) days after date of opening thereof, to waive any informality or irregularity in the Bid, and to be the sole judge of the merits of material included in the respective bids received.

H. EXECUTION OF CONTRACT

After the Contract is awarded, the awardee shall execute the following eight (8) documents:

1) Performance Bond (100% of Bid)
2) Labor and Material Bond (100% of Bid)
3) Contract - Public Works Agreement
4) Verification of Insurance Coverage (Certificates and Endorsements)
5) Construction or Service Contract Endorsement
6) Workers' Compensation Insurance Certificate
7) Construction Permit Application Form
8) Business License Application Form

I. APPRENTICESHIP EMPLOYMENT STANDARDS

The Contractor is directed to the provisions in Sections 1776, 1777.5 and 1777.6 of the California Labor Code concerning the employment of apprentices by the contractor or any subcontractor under them.

J. PERMITS, LICENSES AND PUBLIC WORKS AGREEMENT

The Contractor shall procure and execute all permits, licenses, pay all charges and fees, and give all notices necessary and incidental to the completion of the Work. The Contractor shall execute a Public Works Agreement. No fee is charged for a Construction-Excavation Permit issued by the City of Torrance for a public works project. The Contractor shall obtain a City of Torrance Business License.

The Contractor shall be required to obtain a rider to the City of Torrance's encroachment permit from the State.

K. INSURANCE

The Contractor shall maintain Automobile Liability, General Liability and Workers' Compensation Insurance as specified in the Public Works Agreement included in the Project Specifications.

L. PRE-BID INQUIRIES

A Bidder with a Pre-Bid Inquiry must submit their question(s) in writing to the Torrance Public Works Department. You may email it to Emmanuel Martin, Associate Engineer at emartin@TorranceCA.Gov. All questions must be received no later than 5:00 p.m. on the Monday prior to the date for opening the bids. Questions received after this date may not be considered. For questions of a general nature, a bidder may call Emmanuel Martin directly at (310) 618-3069.

SECTION C

BID DOCUMENTS

BIDDER'S PROPOSAL

Company: _____ Total Bid: _____

PROPOSAL, SPECIFICATIONS, BOND AND AFFIDAVIT FOR THE CONSTRUCTION OF WESTERN AVENUE AND ROLLING HILLS ROAD WATER MAIN REPLACEMENT PROJECT, CIP No. I-107 AND RECYCLED WATER RETROFITS FOR THE ANZA AVENUE MEDIANS AND PARKS PROJECT, CIP No. I-78 B2012-01

Honorable Mayor and Members
of the Torrance City Council
Torrance, California

Members of the Council:

In accordance with the Notice Inviting Bids pertaining to the receiving of sealed proposals by the City Clerk of the City of Torrance for the above titled improvement, the undersigned hereby proposes to furnish all Work to be performed in accordance with the Plans, Specifications, Standard Drawings, and the Contract Documents, for the unit price or lump sum set forth in the following schedule.

BID SCHEDULE A
WESTERN AVENUE AND ROLLING HILLS ROAD WATER MAIN REPLACEMENT PROJECT

Item	Quantity	Unit	Description	Unit Price	Amount
1	1	LS	Mobilization/Demobilization (5%).	$_____	$_____
2	1	LS	Furnish and install excavation safety measures, including adequate sheeting, shoring and bracing or equivalent methods for the protection of life and limb for construction of water mains and appurtenances per Section 6707 of California Labor Code.	$_____	$_____
3	4,231	LF	Furnish and install 12" inch diameter ductile iron pipe, CL-350, including fittings, thrust blocks, restrained joints, backfill per City Std. No. T701, potholing, replacing control detector loops, AC pavement replacement, restoration of surface features, pressure and disinfection testing, and all appurtenances required for a complete system, in accordance with the plans and specifications and standard drawings.	$_____	$_____

4	404	LF	Furnish and install 8" inch diameter ductile iron pipe, CL-350, including fittings, thrust blocks, restrained joints, backfill per City Std. No. T701, potholing, replacing control detector loops, AC pavement replacement, restoration of surface features, pressure and disinfection testing, and all appurtenances required for a complete system, in accordance with the plans and specifications and standard drawings.	$_____	$_____
5	282	LF	Furnish and install 6 inch diameter ductile iron pipe, CL-350, including fittings, thrust blocks, restrained joints, backfill per City Std. No. T701, potholing, replacing control detector loops, AC pavement replacement, restoration of surface features, pressure and disinfection testing, and all appurtenances required for a complete system, in accordance with the plans and specifications and standard drawings	$_____	$_____
6	117	LF	Furnish and install 20 inch Steel Casing Per City of Torrance Std. No. T715, and in accordance with plans, specifications and standard drawings	$_____	$_____
7	1	EA	Provide Jacking Pit for jacking operation duration including drilling, reaming and installing of steel casing, backfill of pit, AC pavement replacement, and restoration of surface features, in accordance with plans, specifications and standard drawings.	$_____	$_____
8	1	EA	Provide Receiving Pit for jacking operation duration including drilling, reaming and installing of steel casing, backfill of pit, AC pavement replacement, and restoration of surface features, in accordance with plans, specifications and standard drawings.	$_____	$_____
9	12	EA	Furnish and install 12 inch RW Gate Valve, including valve box assembly per City Std. No. T712, and in accordance with plans, specifications and standard drawings	$_____	$_____
10	1	EA	Furnish and install 10 inch RW Gate Valve, including valve box assembly per City Std. No. T712, and in accordance with plans, specifications and standard drawings	$_____	$_____
11	4	EA	Furnish and install 8 inch RW Gate Valve, including valve box assembly per City Std. No. T712, and in accordance with plans, specifications and standard drawings	$_____	$_____
12	2	EA	Furnish and install 6 inch RW Gate Valve, including valve box assembly per City Std. No. T712, and in accordance with plans, specifications and standard drawings	$_____	$_____
13	2	EA	Furnish and install 4 inch RW Gate Valve, including valve box assembly per City Std. No. T712, and in accordance with plans, specifications and standard drawings	$_____	$_____
14	8	EA	Remove And Replace Existing Service Meter and Meter Boxes Per City Of Torrance Std. No. T702, T703 And T704 (Size To Be Verified)	$_____	$_____

15	8	EA	Furnish and install Fire Hydrant Assemblies including valve and piping per City Std. No. T706 in accordance with plans, specifications, and standard drawings.	$_____	$_____
16	1	EA	Furnish and install Air and Vacuum Release Valve including piping per City Std. No. T708 in accordance with plans, specifications and standard drawings.	$_____	$_____
17	1,950	SY	Remove and dispose portion of existing Western Ave Structural Section and Unclassified Materials to a depth of 6-Inches in accordance with the plans, specification and standard drawings.	$_____	$_____
18	1,950	SY	Construct 2-inches Asphalt Concrete (C2-PG64-10) Over 4-inches Asphalt Concrete (B-PG64-10) Over Compacted Sub-grade over portion of Western Ave in accordance with the plans, specification and standard drawings.	$_____	$_____
19	1,725	SY	Grind portion of existing Western Ave Section to a depth of 3-inches in accordance with the plans, specification and standard drawings.	$_____	$_____
20	1,725	SY	Construct 3-inches Asphalt Concrete (C2-PG64-10) over portion of Western Ave in accordance with the plans, specification and standard drawings.	$_____	$_____
21	6,556	SY	Apply Type II Slurry in accordance with plans, specifications and standard drawings	$_____	$_____
22	1	LS	Install Traffic Striping, Pavement Marking and Curb Marking, and in accordance with plans, specifications and standard drawings	$_____	$_____
23	1	LS	Furnish and install Traffic Control measures including: obtaining approvals and permits of plans, install Temporary Pavement Markers and delineation, install delineators, cones, signs, flashing arrow board, flag man, install temporary and permanent pavement markings and signs, restoration of striping, steel plating, lights for night work, and modifications to traffic signals in accordance with the plans, specification and standard drawings.	$_____	$_____
24	1	LS	Caltrans and LACDPW Permit and Fees	$_____	$_____
25	2	EA	Provide and Install Project Construction Signs Per City Std. No. T503.	$_____	$_____
26	4	EA	Provide Portable Changeable Message Signs (PCMS), in accordance with plans, specifications and standard drawings	$_____	$_____

27	1	LS	Install damaged Curb, Gutter, and Sidewalk to match existing, and in accordance with plans, specifications and standard drawings	$_____	$_____
28	1	LS	Abandon Valves, Hydrants, Blow off Assemblies, other Appurtenances, and in accordance with plans, specifications and standard drawings	$_____	$_____
29	1	LS	Prepare SWPPP-WPC Manual 2011, Erosion and Sediment Control Plan, submit NOI and NOT to meet NPDES Compliance and BMPs	$_____	$_____
30	500	CY	Crushed rock to replace unsuitable trench bottom material, including import, haul, compaction, complete. This is an allowance	$25/cy	$12,500

TOTAL BID PRICE FOR SCHEDULE A : $_____
(Figures)*

TOTAL BID PRICE FOR SCHEDULE A : _____
(Words)*

_____

BID SCHEDULE B
RECYCLED WATER RETROFITS FOR
ANZA AVENUE MEDIANS AND PARKS PROJECT

Anza Avenue Medians					
Item No.	Quantity	Unit	Description	Unit Price	Total Bid
1	2	EA	Install 2 inch Recycled Water Meter and other Appurtenances, and in accordance with plans, specifications and standard drawings (meter provided by CWSC)	$_____	$_____
2	3	EA	Install 2 inch Recycled Water Meter and other Appurtenances, and in accordance with plans, specifications and standard drawings (meter provided by City of Torrance)	$_____	$_____
3	2	EA	Install 1 inch Recycled Water Meter and other Appurtenances, and in accordance with plans, specifications and standard drawings (meter provided by City of Torrance)	$_____	$_____
4	5	EA	Furnish and Install 2 inch PRV, 2 inch Wye-Strainer and other Appurtenances, and in accordance with plans, specifications and standard drawings	$_____	$_____
5	2	EA	Furnish and Install 1 inch PRV, 1 inch Wye-Strainer, and other Appurtenances, and in accordance with plans, specifications and standard drawings	$_____	$_____
7	1	LS	Construct Lateral to Connect East Medians Meter to Recycled Water Stub in accordance with plans, specifications and standard drawings	$_____	$_____
8	8	EA	Remove Existing Backflow Devices in accordance with plans, specifications and standard drawings	$_____	$_____
9	20	EA	Remove Hose Bib Connections and Cap Below Ground (Median North of Sepulveda) in accordance with plans, specifications and standard drawings	$_____	$_____
10	1	LS	Repair Damaged Landscape and Sidewalk in accordance with plans, specifications and standard drawings	$_____	$_____

11	34	EA	Furnish and Install Recycled Water Signs in accordance with plans, specifications and standard drawings	$_____	$_____
12	1	LS	Furnish and Install Identification RW Tagging and Marking in accordance with plans, specifications and standard drawings	$_____	$_____
13	3	EA	Abandon Existing 1 inch Potable Water Meter in accordance with plans, specifications and standard drawings	$_____	$_____
14	2	EA	Abandon Existing 2 inch Potable Water Meter in accordance with plans, specifications and standard drawings	$_____	$_____
15	1	LS	Furnish **Traffic Control Plans** and install Traffic Control measures including: obtaining approvals and permits of plans, delineators, cones, signs, flashing arrow board, flag man, install temporary and permanent pavement markings and signs, restoration of striping, in accordance with the plans, specification and standard drawings.	$_____	$_____

Sub-Total for Anza Avenue Medians **$ _____**

SEA SIDE HEROES PARK					
1	1	LS	Install 2 inch Recycled Water Meter and 2 inch Recycled Water Service Connection and other Appurtenances in accordance with plans, specifications and standard drawings (meter provided by City of Torrance)	$_____	$_____
2	1	LS	Furnish and Install 2 inch PRV, 2 inch Wye-Strainer and Protective Enclosures and other Appurtenances in accordance with plans, specifications and standard drawings	$_____	$_____
3	35	LF	Furnish and Install 2 inch Purple PVC Pipe in accordance with plans, specifications and standard drawings	$_____	$_____
4	1	LS	Remove Existing Backflow Devices in accordance with plans, specifications and standard drawings	$_____	$_____
5	6	EA	Remove Flush Valve and Replace with RW Quick Coupler in accordance with plans, specifications and standard drawings	$_____	$_____
6	1	LS	Remove and replace Sidewalk in accordance with plans, specifications and standard drawings	$_____	$_____
7	10	EA	Furnish and Install Identification RW Tagging and Marking in accordance with plans, specifications and standard drawings	$_____	$_____
8	1	LS	Repair Damaged Landscape and Irrigation in accordance with plans, specifications and standard drawings	$_____	$_____

9	1	EA	Abandon Existing 2 inch Potable Water Meter in accordance with plans, specifications and standard drawings	$_____	$_____
10	1	LS	Furnish **Traffic Control Plans** and install Traffic Control measures including: obtaining approvals and permits of plans, delineators, cones, signs, flashing arrow board, flag man, install temporary and permanent pavement markings and signs, restoration of striping, in accordance with the plans, specification and standard drawings.	$_____	$_____

Sub-Total for Sea Side Heroes Park **$ _____**

LA PALOMA PARK					
1	1	LS	Connect to RW stub-out and Install New 1 ½ inch RW Meter and Meter Box in accordance with the plans, specification and standard drawings (Meter to be provided by City of Torrance)	$_____	$_____
2	1	LS	Furnish and Install 3 inch Pressure Reducing Valve Assembly in accordance with the plans, specification and standard drawings.	$_____	$_____
3	50	LF	Furnish and Install 1 ½ inch Purple PVC Pipe (CL 315) from New 1 ½ inch RW Meter and Connect to Existing Irrigation Main in accordance with the plans, specification and standard drawings.	$_____	$_____
4	1	LS	Repair Damaged Landscape and Irrigation in accordance with plans, specifications and standard drawings	$_____	$_____
5	3	EA	Furnish and Install Recycled Water Signs and in accordance with plans, specifications and standard drawings	$_____	$_____
6	50	EA	Furnish and Install Identification RW Tagging and Marking in accordance with plans, specifications and standard drawings	$_____	$_____
7	1	LS	Concrete Repair in accordance with plans, specifications and standard drawings	$_____	$_____
8	18	EA	Remove Potable Water Quick Coupler and Replace with Recycled Water Quick Coupler in accordance with plans, specifications and standard drawings	$_____	$_____
9	1	EA	Abandon Existing 1 ½ inch Potable Water Meter in accordance with plans, specifications and standard drawings	$_____	$_____

Sub-Total for La Paloma Park **$ _____**

PARADISE PARK					
1	1	LS	Install 3 inch RW Meter and Meter Box in accordance with plans, specifications and standard drawings (Meter to be provided by California Water Service Company)	$_____	$_____
2	1	LS	Furnish and Install 3 inch Pressure Reducing Valve (PRV) Assembly in accordance with plans, specifications and standard drawings	$_____	$_____
3	1	LS	Furnish and Install 3 inch Purple PVC Pipe (CL 315) from 3 inch RW meter to PRV and from PRV to existing Irrigation backbone in accordance with plans, specifications and standard drawings	$_____	$_____
4	1	LS	Install 1 inch PW Meter in accordance with plans, specifications and standard drawings (Meter to be provided by California Water Service Company)	$_____	$_____
5	1	LS	Furnish and Install 1 inch Reduced Pressure Assembly (Sinks and Drinking Fountain) in accordance with plans, specifications and standard drawings	$_____	$_____
6	1	LS	Furnish and Install 1 inch Reduced Pressure Assembly (Restrooms) in accordance with plans, specifications and standard drawings	$_____	$_____
7	1	LS	Repair Damaged Landscape and Sidewalk in accordance with plans, specifications and standard drawings	$_____	$_____
8	1	LS	Remove Existing 3 inch backflow Assembly in accordance with plans, specifications and standard drawings	$_____	$_____
9	1	LS	Remove Existing Fire Hydrant and Abandon Valve in accordance with plans, specifications and standard drawings	$_____	$_____
10	60	LF	Construct Concrete Mow Strip in accordance with plans, specifications and standard drawings	$_____	$_____
11	5	EA	Furnish and Install Recycled Water Signs in accordance with plans, specifications and standard drawings	$_____	$_____
12	1	LS	Furnish and Install Identification Recycled Water Tagging and Marking in accordance with plans, specifications and standard drawings	$_____	$_____
13	1	LS	Furnish and Install Identification Potable Water Tagging and Marking in accordance with plans, specifications and standard drawings	$_____	$_____
14	4	EA	Furnish and Install Hose Bib Vacuum Breakers in accordance with plans, specifications and standard drawings	$_____	$_____
15	21	EA	Remove Existing PW Quick Couplers and Replace w/ RW Quick Couplers in accordance with plans, specifications and standard drawings		

Sub-Total for Paradise Park $ _____

VICTOR PARK					
1	1	LS	Furnish and Install 4 Inch Purple PVC Pipe from New 3 Inch RW Meter and Connect to Existing Irrigation Main in accordance with plans, specifications and standard drawings	$_____	$_____
2	1	LS	Remove Existing 3 Inch RP Assembly in accordance with plans, specifications and standard drawings	$_____	$_____
3	1	LS	Furnish and Install 2 Inch RP Assembly (Onyx Street) in accordance with plans, specifications and standard drawings	$_____	$_____
4	1	LS	Repair Damaged Landscape and Sidewalk in accordance with plans, specifications and standard drawings	$_____	$_____
5	1	LS	Connect to RW stub out and Install New 3 Inch RW Meter and Meter Box (Meter to be provided by California Water Service Company) in accordance with plans, specifications and standard drawings	$_____	$_____
6	3	EA	Furnish and Install Hood Over Drinking Fountain in accordance with plans, specifications and standard drawings	$_____	$_____
7	10	EA	Furnish and Install Recycled Water Signs in accordance with plans, specifications and standard drawings	$_____	$_____
8	29	EA	Furnish and Install Identification Recycled Water Tagging and Marking in accordance with plans, specifications and standard drawings	$_____	$_____
9	8	EA	Furnish and Install Identification Potable Water Tagging and Marking in accordance with plans, specifications and standard drawings	$_____	$_____
10	8	EA	Remove Existing PW Quick Couplers and Replace w/ RW Quick Couplers in accordance with plans, specifications and standard drawings	$_____	$_____
11	1	LS	Furnish and Install 3 Inch Pressure Reducing Valve Assembly (PRV) in accordance with plans, specifications and standard drawings	$_____	$_____

Sub-Total for Victor Park **$ _____**

Modifications at Library					
1	1	LS	Furnish and Install 2 inch RP after Existing 2 inch PW Meter in accordance with plans, specifications and standard drawings	$_____	$_____
2	1	LS	Remove Existing 2 Inch Vacuum Breaker Valve Assembly in accordance with plans, specifications and standard drawings	$_____	$_____
3	6	EA	Furnish and Install Identification Recycled Water Tagging and Marking in accordance with plans, specifications and standard drawings	$_____	$_____
4	1	LS	Furnish and Install Identification Potable Water Tagging and Marking in accordance with plans, specifications and standard drawings	$_____	$_____
5	1	LS	Modifications directed by DOHS	$40,000	$40,000

Sub-Total for Modifications at Library **$ _____**

TOTAL BID PRICE FOR SCHEDULE B : $_____
(Figures)*

TOTAL BID PRICE FOR SCHEDULE B : _____
(Words)*

_____

TOTAL BID PRICE FOR SCHEDULE A AND B : $_____
(Figures)*

TOTAL BID PRICE FOR SCHEDULE A AND B : _____
(Words)*

_____

***BID MAY BE REJECTED IF TOTAL IS NOT SHOWN IN FIGURES AND WORDS.**

B2012-01

The undersigned furthermore agrees to enter into and execute a contract, with necessary bonds, at the unit prices set forth herein and in case of default in executing such contract, with necessary bonds, the check or bond accompanying this bid and the money payable thereon shall be forfeited thereby to and remain the property of the City of Torrance.

The above unit prices include all work appurtenant to the various items as outlined in the Specifications and all work or expense required for the satisfactory completion of said items. In case of discrepancies between unit prices and totals, the unit prices shall govern.

The undersigned declares that it has carefully examined the Plans, Specifications, and Contract Documents, and has investigated the site of the work and is familiar with the conditions thereon.

Contractor:_____

Date: _____ By:_____

Contractor's State License No. _____ Class_____

Address:_____

Phone: _____

Fax: _____

ACKNOWLEDGMENT OF ADDENDA RECEIVED – B2012-01

The Bidder shall acknowledge the receipt of addenda by placing an "X" by each addendum received.

Addendum No. 1 ____

Addendum No. 2 ____

Addendum No. 3 ____

Addendum No. 4 ____

Addendum No. 5 ____

Addendum No. 6 ____

Addendum No. 7 ____

Addendum No. 8 ____

If an addendum or addenda have been issued by the City and not noted above as being received by the Bidder, the Bid Proposal may be rejected.

_____ _____

Bidder's Signature Date

CONTRACTOR'S AFFIDAVIT

STATE OF CALIFORNIA }
}
COUNTY OF _____}

Western Avenue and Rolling Hills Road Water Main Replacement Project CIP No. I-107, and Recycled Water Retrofits for Anza Avenue Medians and Parks Project, CIP No. I-78.

_____, being first duly sworn, deposes and says:

1. That he is the

_____
Title

of _____
(Name of Partnership, Corporation, or Sole Proprietorship)

hereinafter called "Contractor," who has submitted to the City of Torrance a proposal for the **Construction of Western Avenue and Rolling Hills Road Water Main Replacement Project, CIP No. I-107, and Recycled Water Retrofits for Anza Avenue Medians and Parks Project, CIP No. I-78, B2012-01**;

2. That said proposal is genuine; that the same is not sham; that all statement of facts therein are true;

3. That such proposal was not made in the interest or behalf of any person, partnership, company, association, organization or corporation not named or disclosed;

4. That the Contractor did not, directly or indirectly, induce, solicit or agree with anyone else to submit a false or sham bid, to refrain from bidding, or to withdraw the bid, to raise or fix the bid price of the Contractor or anyone else, or to raise or fix any overhead, profit or cost element of the Contractor's price or the price of anyone else; and did not attempt to induce action prejudicial to the interest of the City of Torrance, or of any other bidder, or anyone else interested in the proposed contract;

5. That the Contractor has not in any manner sought by collusion to secure for itself an advantage over any other bidder or to induce action prejudicial to the interests of the City of Torrance, or of any other bidder or of anyone else interested in the proposed contract;

6. That the Contractor has not accepted any bid from any subcontractor or materialman through any bid depository, the bylaws, rules or regulations of which prohibit or prevent the Contractor from considering any bid from any subcontractor or materialman, which is not processed through said bid depository, or which

prevent any subcontractor or materialman from bidding to any contractor who does not use the facilities of or accept bids from or through such bid depository;

7. That the Contractor did not, directly or indirectly, submit the Contractor's bid price or any breakdown thereof, or the contents thereof, or divulge information or data relative thereto, to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof, or to any individual or group of Individuals, except to the City of Torrance, or to any person or persons who have a partnership or other financial interest with said Contractor in its business.

Dated this _____ day of _____, 2012.

Subscribed and Sworn to
before me this _____ day
of _____, 2012.

_____
(Contractor)

_____
(Title)

_____
Notary Public in and for said
County and State.
(Seal)

BID BOND (10%)

Western Avenue and Rolling Hills Road Water Main Replacement Project, CIP No. I-107, and Recycle Water Retrofits for Anza Avenue Medians and Parks Project, CIP No. I-78
B2012-01

KNOW ALL MEN BY THESE PRESENTS: That we, _____

_____

as principal, and _____

as sureties, are held and firmly bound unto the City of Torrance, State of California, in the penal sum of _____ dollars ($_____), for the payment whereof we hereby bind ourselves, our successors, heirs, executors or administrators jointly and severally, firmly by these presents.

The condition of this obligation is such that, whereas the above bounded principal is about to file with and submit to the City of Torrance a bid or proposal for the performance of certain work as required in the City of Torrance, Project No. B2012-01, said work being: **the Western Avenue and Rolling Hills Road Water Main Replacement Project CIP No. I-107, and Recycled Water Retrofits for Anza Avenue Medians and Parks Project, CIP No. I-78** and in compliance with the Specifications therefore under an invitation of said City contained in a notice or advertisement for bids or proposals; now if the bid or proposal of the said principal shall be accepted and if the said work be thereupon awarded to the principal by said City and if the said principal shall enter into a contract with the said City in accordance with said bid or proposal, or if the bid or proposal of the said principal is rejected, then this bond shall be void and of no effect and otherwise in full force and effect.

WITNESS our hands this _____ day of _____, 2012.

_____
Principal

_____
Surety/Attorney-in-Fact

_____
Signature

Name: _____
Local Address: _____
_____
Phone No.: _____
Fax No.: _____

LIST OF SUBCONTRACTORS
B2012-01

The Bidder is required to fill in the following blanks in accordance with the provisions of the Subletting and Subcontracting Fair Practices Act (Chapter 2 of Division 5, Title 1 of the Government Code of the State of California). The contractor, sub recipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of Title 49 CFR (Code of Federal Regulations) part 26 in the award and administration of US DOT assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy, as the recipient deems appropriate. Each subcontract signed by the bidder must include this assurance.
Failure of the bidder to fulfill the requirements of the Special Provisions for submittals required to be furnished after bid opening, including but not limited to escrowed bid documents, where applicable, may subject the bidder to a determination of the bidder's responsibility in the event it is the apparent low bidder on a future public works contracts.

Name Under Which Subcontractor is Licensed: _____

Subcontractor's Address: _____

Specific Description of Sub-Contract: _____

License Number: _____ CA License Classification/Type: _____

Name Under Which Subcontractor is Licensed: _____

Subcontractor's Address: _____

Specific Description of Sub-Contract: _____

License Number: _____ CA License Classification/Type: _____

Name Under Which Subcontractor is Licensed: _____

Subcontractor's Address: _____

Specific Description of Sub-Contract: _____

License Number: _____ CA License Classification/Type: _____

Subcontractors listed must be properly licensed under the laws of the State of California for the type of work which they are to perform. Do not list alternate subcontractors for the same work.

REFERENCES (Page 1 of 2)
B2012-01

List work similar in magnitude and degree of difficulty completed by the Contractor within the past three (3) years.

1. Name (Firm/Agency): _____
   Address: _____
   Contact Person: _____ Telephone No.: _____
   Title of Project: _____
   Project Location: _____
   Date of Completion: _____ Contract Amount: $ _____

2. Name (Firm/Agency): _____
   Address: _____
   Contact Person: _____ Telephone No.: _____
   Title of Project: _____
   Project Location: _____
   Date of Completion: _____ Contract Amount: $ _____

3. Name (Firm/Agency): _____
   Address: _____
   Contact Person: _____ Telephone No.: _____
   Title of Project: _____
   Project Location: _____
   Date of Completion: _____ Contract Amount: $ _____

4. Name (Firm/Agency): _____
   Address: _____
   Contact Person: _____ Telephone No.: _____
   Title of Project: _____
   Project Location: _____
   Date of Completion: _____ Contract Amount: $ _____

REFERENCES (PAGE 2 OF 2)
B2012-01

If Contractor has not performed work for the City of Torrance within the last five (5) years, list all work done within said five years (attach additional sheets if necessary). Note if work was done as subcontractor [include only subcontract amount]:

Work Description & Contract Amount	Agency	Date Completed

Contractor's License No.: _____ Class: _____

a. Date first obtained: _____ Expiration: _____

b. Has License ever been suspended or revoked? _____

If yes, describe when and why: _____

c. Any current claims against License or Bond? _____

If yes, describe claims: _____

Principals in Company (List all – attach additional sheets if necessary):

NAME	TITLE	LICENSE NO. (If Applicable)
_____	_____	_____
_____	_____	_____
_____	_____	_____

DBE

BIDDERS LIST
Western Avenue and Rolling Hills Road Water Main Replacement Project CIP No. I-107, and Recycled Water Retrofits for Anza Avenue Medians and Parks Project, CIP No. I-78
B2012-01

All bidders/proposers are required to provide the following information for all DBE and non-DBE contractors or consultants who provided a proposal, bid quote, or were contacted by the proposed prime. This information is also required from the proposed prime contractor/consultant and must be submitted with their bid/proposal. The City of Torrance will use this information to maintain and update a "Bidders" List to assist in the overall annual DBE goal-setting process.

Firm Name:_____ Phone:_____

Address:_____ Fax:_____

Contact Person:_____ No. of Years in Business:_____

Is the firm currently certified as a DBE under 49 CFR Part 26: YES:_____ NO:_____

Type of work/services/materials provided by firm?_____

What was your firm's Gross Annual receipt for last year?

Less than $1 Million
Less than $5 Million
Less than $10 Million
Less than $15 Million
More than $15 Million

*This form can be duplicated if necessary to report all bidders (DBEs and non-DBEs) information

VIOLATIONS OF FEDERAL, STATE OR LOCAL LAWS
B2012-01

1. Has your firm or its officers been assessed any penalties by an agency for noncompliance or violations of Federal, State or Local labor laws and/or business or licensing regulations within the past five (5) years relating to your construction projects?

   Yes/No: _____Federal/State:_____

   If "yes," identify and describe, (including agency and status): _____

   _____

   _____

   _____

   Have the penalties been paid? Yes/No: _____

2. Does your firm or its officers have any ongoing investigations by any public agency regarding violations of the State Labor Code, California Business and Professions Code or State Licensing Laws?

   Yes/No: _____ Code/Laws: _____ Section/Article: _____

   If "yes," identify and describe, (including agency and status): _____

   _____

   _____

   _____

DISQUALIFICATION OR DEBARMENT

Has your firm, any officer of your firm, or any employee who has a proprietary interest in your firm ever been disqualified, removed, or otherwise prevented from bidding on, performing work on, or completing a federal, state or local project because of a violation of law or a safety regulation? Yes/No: _____. If yes, provide the following information (if more than once, use separate sheets):

Date: _____ Entity: _____

Location: _____

Reason: _____

_____

_____

_____

_____

Provide Status and any Supplemental Statement: _____

_____

_____

_____

_____

Has your firm been reinstated by this entity? Yes/No: _____

SECTION D

DOCUMENTS TO BE COMPLETED AND DELIVERED TO CITY PRIOR TO AWARD OF CONTRACT

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS:

That we, _____as Principal(s) and _____a corporation, incorporated, organized, and existing under the laws of the State of _____, and authorized to execute bonds and undertakings and to do a general surety business in the State of California, as Surety, are jointly and severally held and firmly bound unto the City of Torrance, a municipal corporation, located in the County of Los Angeles, State of California, in the full and just sum of: _____ Dollars ($_____), lawful money of the United States of America, for the payment of which sum, well and truly to be made, we bind ourselves and our respective heirs, executors, administrators, representative, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that: **WHEREAS,** said Principal(s) have/has entered into, or are/is about to enter into, a certain written contract or agreement, dated as of the _____ day of _____, 20____, with the said City of Torrance for the Construction of **Western Avenue and Rolling Hills Road Water Main Replacement Project CIP No. I-107, and Recycled Water Retrofits for Anza Avenue Medians and Parks Project, CIP No. I-78, B2012-01** all as is more specifically set forth in said contract or agreement, a full, true and correct copy of which is hereunto attached, and hereby referred to and by this reference incorporated herein and made a part hereof;

NOW, THEREFORE, if the said Principal(s) shall faithfully and well and truly do, perform and complete, or cause to be done, performed and complete, each and all of the covenants, terms, conditions, requirements, obligations, acts and things, to be met, done or performed by said Principal(s), including any guarantee period as set forth in, or required by, said contract or agreement, all at and within the time or times, and in the manner as therein specified and contemplated, then this bond and obligation shall be null and void; otherwise it shall be and remain in full force, virtue and effect.

The said Surety, for value received, hereby stipulates and agrees that no amendment, change, extension of time, alteration or addition to said contract or agreement, or of any feature or item or items of performance required therein or thereunder, shall in any manner affect its obligations on or under this bond; and said Surety does hereby waive notice of any such amendment, change, extension of time, alteration, or addition to said contract or agreement, and of any feature or item or items of performance required therein or thereunder.

PERFORMANCE BOND (CONTINUED)

In the event any suit, action or proceedings is instituted to recover on this bond or obligation, said Surety will pay, and does hereby agree to pay, as attorney's fees for said City, such sum as the Court in any such suit, action or proceeding may adjudge reasonable.

EXECUTED, SEALED AND DATED this _____ day of _____, 2012.

CORPORATE SEAL

PRINCIPAL(S):

BY _____

BY _____

CORPORATE SEAL

SURETY:

BY _____

LABOR AND MATERIAL BOND

KNOW ALL MEN BY THESE PRESENTS:

That we,_____
As Principal(s) and _____ a corporation, incorporated, organized, and existing under the laws of the State of _____, and authorized to execute bonds and undertakings and to do a general surety business in the State of California, as Surety, are jointly and severally held and firmly bound unto:

(a) The State of California for the use and benefit of the State Treasurer, as ex-officio Treasurer and custodian of the Unemployment Fund of said State; and

(b) The City of Torrance, California; and

(c) Any and all persons who do or perform or who did or performed work or labor upon or in connection with the work or improvement referred to in the contract or agreement hereinafter mentioned; and

(d) Any and all materialmen, persons, companies, firms, association, or corporations, supplying or furnishing any materials, provisions, provender, transportation, appliances or power, or other supplies used in, upon, for or about or in connection with the performance of the work or improvement contracted to be executed, done, made or performed under said contract or agreement; and

(e) Any and all persons, companies, firms, associations, or corporations furnishing, renting, or hiring teams, equipment, implements or machinery for, in connection with, or contributing to, said work to be done or improvement to be made under said contract or agreement; and

(f) Any and all persons, companies, firms, associations, or corporations who supply both work and materials;

and whose claim has not been paid by said Principal(s), in full and just sum of _____ Dollars ($_____), lawful money of the United States of America, for the payment of which will and truly to be made, said Principal(s) and said Surety do hereby bind themselves and their respective heirs, executors, administrators, representatives, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THE FOREGOING OBLIGATION IS SUCH, THAT: WHEREAS, said Principal(s) have/has entered into or are/is about to enter into a certain written contract or agreement, dated as of the _____ day of _____20 ___, with the City of Torrance for the Construction of **Western Avenue and Rolling Hills Road Water Main Replacement Project CIP No. I-107, and Recycled Water Retrofits for Anza Avenue Medians and Parks Project, CIP No. I-78, B2012-01** all as is more specifically set forth in said contract or agreement, a full, true and correct copy of which is hereunto attached, and hereby referred to and by this reference incorporated herein and made a part hereof;

NOW, THEREFORE, if the said Principal(s) (or any of his/her, its, or their subcontractors) under said contract or agreement fails or fail to pay:

(1) For any materials, provisions, provender, transportation, appliances, or power, or other supplies; or

(2) For the hire of any teams, equipment, implements, or machinery; or

(3) For any work or labor; supplies, furnished, provided, used, done or performed in, upon, for or about or in connection with the said work or improvement; or

(4) For amounts due under the Unemployment Insurance Act of the State of California with respect to such work or improvement;

the Surety on this bond will pay the same in an amount not exceeding the sum hereinabove specified in this bond; and, also, in case suit is brought upon this bond, said Surety will (and does hereby agree to) pay a reasonable attorney's fee, to be fixed and taxed as costs, and included in the judgment therein rendered.

This bond shall (and it is hereby made to) insure to the benefit of any and all persons entitled to file claims under Section 1192.1 of the Code of Civil Procedure of the State of California, so as to give a right of action to them or their assigns in any suit brought upon this bond, all as contemplated under the provisions of Section 4205 of the Government Code, and of Chapter 1 of Title 4 of Part 3 of the Code of Civil Procedure, of the State of California.

This bond is executed and filed in connection with said contract or agreement hereunto attached to comply with each and all of the provisions of the laws of the State of California above mentioned or referred to, and of all amendments thereto, and the obligors so intend and do hereby bind themselves accordingly.

LABOR AND MATERIAL BOND (CONTINUED)

The said Surety, for value received, hereby stipulates and agrees that no amendment, change, extension of time, alteration, or addition to said contract or agreement, or of any feature or item or items of performance required therein or thereunder, shall in any manner affect its obligations on or under this bond; and said Surety does hereby waive notice of any such amendment, change, extension of time, alteration, or addition to said contract or agreement, and of any feature or item or items of performance required therein or thereunder.

EXECUTED, SEALED AND DATED this _____ day of _____, 20_____

CORPORATE SEAL

PRINCIPAL:

BY _____

CORPORATE SEAL

SURETY:

BY _____

PUBLIC WORKS AGREEMENT

This PUBLIC WORKS AGREEMENT ("Agreement") is made and entered into as of _____, 20___ (the "Effective Date"), by and between the CITY OF TORRANCE, a municipal corporation ("CITY"), and _____ ("CONTRACTOR").

RECITALS:

A. The CITY wishes to retain the services of an experienced and qualified CONTRACTOR to construct **Western Avenue and Rolling Hills Road Water Main Replacement Project CIP No. I-107, and Recycled Water Retrofits for Anza Avenue Medians and Parks Project, CIP No. I-78**

B. In order to obtain the desired services, The CITY has circulated a Notice Inviting Bids for the construction of **Western Avenue and Rolling Hills Road Water Main Replacement Project CIP No. I-107, and Recycled Water Retrofits for Anza Avenue Medians and Parks Project, CIP No. I-78** Notice Inviting Bids No. B2012-01 (the "NIB"); and

C. CONTRACTOR has submitted a Bid (the "Bid") in response to the NIB. CONTRACTOR represents that it is qualified to perform those services requested in the Plans and Specifications. Based upon its review of all Bids submitted in response to the NIB, The CITY is willing to award the contract to CONTRACTOR.

AGREEMENT:

1. SERVICES TO BE PERFORMED BY CONTRACTOR

CONTRACTOR will provide the services and install those materials listed in the Plans and Specifications, which are on file in the Public Works Department. The NIB and the Plans and Specifications are made a part of this Agreement. A copy of the Bid is attached as Exhibit A.

2. TERM

Unless earlier terminated in accordance with Paragraph 4 below, this Agreement will continue in full force and effect for one year from the Effective Date.

3. COMPENSATION

A. CONTRACTOR's Fee.

For services rendered pursuant to this Agreement, CONTRACTOR will be paid in accordance with CONTRACTOR's Bid; provided, however, that in no event will the total amount of money paid the CONTRACTOR, for services initially contemplated by this Agreement, exceed the sum of $_____ ("Agreement Sum"), unless otherwise first approved in writing by the CITY.

B. Schedule of Payment.

Provided that the CONTRACTOR is not in default under the terms of this Agreement, upon presentation of an invoice, CONTRACTOR will be paid monthly, within 30 days after the date of the monthly invoice.

4. TERMINATION OF AGREEMENT

A. Termination by CITY for Convenience.

1. CITY may, at any time, terminate the Agreement for CITY's convenience and without cause.

2. Upon receipt of written notice from CITY of such termination for CITY's convenience, CONTRACTOR will:

   a) cease operations as directed by CITY in the notice;
   b) take actions necessary, or that CITY may direct, for the protection preservation of the work; and
   c) except for work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

3. In case of such termination for CITY's convenience, CONTRACTOR will be entitled to receive payment for work executed; and costs incurred by reason of such termination, along with reasonable overhead and profit on the work not executed.

B. Termination for Cause.

1. If either party fails to perform any term, covenant or condition in this Agreement and that failure continues for 15 calendar days after the nondefaulting party gives the defaulting party notice of the failure to perform, this Agreement may be terminated for cause; provided, however, that if during the notice period the defaulting party has promptly commenced and continues diligent efforts to remedy the default, the defaulting party will have such additional time as is reasonably necessary to remedy the default.

2. In the event this Agreement is terminated for cause by the default of the CONTRACTOR, the CITY may, at the expense of the CONTRACTOR and its surety, complete this Agreement or cause it to be completed. Any check or bond delivered to the CITY in connection with this Agreement, and the money payable thereon, will be forfeited to and remain the property of the CITY. All moneys due the CONTRACTOR under the terms of this Agreement will be retained by the CITY, but the retention will not release the CONTRACTOR and its surety from liability for the default. Under these circumstances, however, the CONTRACTOR and its surety will be credited with the amount of money retained, toward any amount by which the cost of completion exceeds the Agreement Sum and any amount authorized for extra services.

3. Termination for cause will not affect or terminate any of the rights of the CITY as against the CONTRACTOR or its surety then existing, or which may thereafter accrue because of the default; this provision is in addition to all other rights and remedies available to the CITY under law.

C. Termination for Breach of Law.

In the event the CONTRACTOR or any of its officers, directors, shareholders, employees, agents, subsidiaries or affiliates is convicted (i) of a criminal offense as an incident to obtaining or attempting to obtain a public or private contract or subcontract, or in the performance of a contract or subcontract; (ii) under state or federal statutes of embezzlement, theft, forgery, bribery, falsification or destruction of records, receiving stolen property, or any other offense indicating a lack of business integrity or business honesty which currently, seriously, and directly affects responsibility as a public consultant or contractor; (iii) under state or federal antitrust statutes arising out of the submission of bids or proposals; or (iv) of violation of Paragraph 19 of this Agreement; or for any other cause the CITY determines to be so serious and compelling as to affect CONTRACTOR's responsibility as a public consultant or contractor, including but not limited to, debarment by another governmental agency, then the CITY reserves the unilateral right to terminate this Agreement or to impose such other sanctions (which may include financial sanctions, temporary suspensions or any other condition deemed appropriate short of termination) as it deems proper. The CITY will not take action until CONTRACTOR has been given notice and an opportunity to present evidence in mitigation.

5. FORCE MAJEURE

If any party fails to perform its obligations because of strikes, lockouts, labor disputes, embargoes, acts of God, inability to obtain labor or materials or reasonable substitutes for labor or materials, governmental restrictions, governmental regulations, governmental controls, judicial orders, enemy or hostile governmental action, civil commotion, fire or other casualty, or other causes beyond the reasonable control of the party obligated to perform, then that party's performance shall be excused for a period equal to the period of such cause for failure to perform.

6. RETENTION OF FUNDS

CONTRACTOR authorizes the CITY to deduct from any amount payable to CONTRACTOR (whether or not arising out of this Agreement) any amounts the payment of which may be in dispute or that are necessary to compensate the CITY for any losses, costs, liabilities, or damages suffered by the CITY, and all amounts for which the CITY may be liable to third parties, by reason of CONTRACTOR's negligent acts or omissions or willful misconduct in performing or failing to perform CONTRACTOR's obligations under this Agreement. In the event that any claim is made by a third party, the amount or validity of which is disputed by CONTRACTOR, or any indebtedness exists that appears to be the basis for a claim of lien, the CITY may withhold from any payment due, without liability for interest because of the withholding, an amount sufficient to cover the claim. The failure of the CITY to exercise the right to deduct or to withhold will not, however, affect the obligations of CONTRACTOR to insure, indemnify, and protect the CITY as elsewhere provided in this Agreement.

7. THE CITY'S REPRESENTATIVE

The Public Works Director is designated as the "City Representative," authorized to act in its behalf with respect to the work and services specified in this Agreement and to make all decisions in connection with this Agreement. Whenever approval, directions, or other actions are required by the CITY under this Agreement, those actions will be taken by the City Representative, unless otherwise stated. The City Manager has the right to designate another City Representative at any time, by providing notice to CONTRACTOR.

8. CONTRACTOR REPRESENTATIVE(S)

The following principal(s) of CONTRACTOR are designated as being the principal(s) and representative(s) of CONTRACTOR authorized to act in its behalf with respect to the work specified in this Agreement and make all decisions in connection with this Agreement:

_____

_____

_____

9. INDEPENDENT CONTRACTOR

The CONTRACTOR is, and at all times will remain as to the CITY, a wholly independent contractor. Neither the CITY nor any of its agents will have control over the conduct of the CONTRACTOR or any of the CONTRACTOR's employees, except as otherwise set forth in this Agreement. The CONTRACTOR may not, at any time or in any manner, represent that it or any of its agents or employees are in any manner agents or employees of the CITY.

10. BUSINESS LICENSE

The CONTRACTOR must obtain a City business license prior to the start of work under this Agreement, unless CONTRACTOR is qualified for an exemption.

11. OTHER LICENSES AND PERMITS

CONTRACTOR warrants that it has all professional, contracting and other permits and licenses required to undertake the work contemplated by this Agreement.

12. FAMILIARITY WITH WORK

By executing this Agreement, CONTRACTOR warrants that CONTRACTOR (a) has thoroughly investigated and considered the scope of services to be performed, (b) has carefully considered how the services should be performed, and (c) fully understands the facilities, difficulties and restrictions attending performance of the services under this Agreement. If the services involve work upon any site, CONTRACTOR warrants that CONTRACTOR has or will investigate the site and is or will be fully acquainted with the conditions there existing, prior to commencement of services set forth in this Agreement. Should CONTRACTOR discover any latent or unknown conditions that will materially affect the performance of the services set forth in this Agreement, CONTRACTOR must immediately inform the CITY of that fact and may not
proceed except at CONTRACTOR's risk until written instructions are received from the CITY.

13. CARE OF WORK

CONTRACTOR must adopt reasonable methods during the life of the Agreement to furnish continuous protection to the work, and the equipment, materials, papers, documents, plans, studies and other components to prevent losses or damages, and will be responsible for all damages, to persons or property, until acceptance of the work by the CITY, except those losses or damages as may be caused by the CITY's own negligence.

14. CONTRACTOR'S ACCOUNTING RECORDS; OTHER PROJECT RECORDS

Records of the CONTRACTOR's time pertaining to the project, and records of accounts between the CITY and the CONTRACTOR, will be kept on a generally recognized accounting basis. CONTRACTOR will also maintain all other records, including without limitation specifications, drawings, progress reports and the like, relating to the project. All records will be available to the CITY during normal working hours. CONTRACTOR will maintain these records for three years after final payment.

15. INDEMNIFICATION

CONTRACTOR will indemnify, defend, and hold harmless CITY, the Redevelopment Agency of the City of Torrance, the City Council, each member thereof, present and future, members of boards and commissions, its officers, agents, employees and volunteers from and against any and all liability, expenses, including defense costs and legal fees, and claims for damages whatsoever, including, but not limited to, those arising from breach of contract, bodily injury, death, personal injury, property damage, loss of use, or property loss however the same may be caused and regardless of the responsibility for negligence. The obligation to indemnify, defend and hold harmless includes, but is not limited to, any liability or expense, including defense costs and legal fees, arising from the negligent acts or omissions, or willful misconduct of CONTRACTOR, its officers, employees, agents, subcontractors or vendors. It is further agreed, CONTRACTOR's obligations to indemnify, defend and hold harmless will apply even in the event of concurrent negligence on the part of CITY, the City Council, each member thereof, present and future, or its officers, agents and employees, except for liability resulting solely from the negligence or willful misconduct of CITY, its officers, employees or agents. Payment by CITY is not a condition precedent to enforcement of this indemnity. In the event of any dispute between CONTRACTOR and CITY, as to whether liability arises from the sole negligence of the CITY or its officers, employees, agents, subcontractors or vendors, CONTRACTOR will be obligated to pay for CITY's defense until such time as a final judgment has been entered adjudicating the CITY as solely negligent. CONTRACTOR will not be entitled in the event of such a determination to any reimbursement of defense costs including but not limited to attorney's fees, expert fees and costs of litigation.

16. NON-LIABILITY OF THE CITY'S OFFICERS AND EMPLOYEES

No officer or employee of the CITY will be personally liable to CONTRACTOR, in the event of any default or breach by the CITY or for any amount that may become due to CONTRACTOR.

17. INSURANCE

A. CONTRACTOR must maintain at its sole expense the following insurance, which will be full coverage not subject to self insurance provisions:

1. Automobile Liability, including owned, non-owned and hired vehicles, with at least the following limits of liability:

   a. Combined single limits of $2,000,000 per occurrence.

2. General Liability including coverage for premises, products and completed operations, independent contractors, personal injury and contractual obligations with combined single limits of coverage of at least $3,000,000 per occurrence, with an annual aggregate of no less than $5,000,000.

3. Workers' Compensation with limits as required by the State of California and Employers Liability with limits of at least $3,000,000.

B. The insurance provided by CONTRACTOR will be primary and non-contributory.

C. The CITY ("City of Torrance"), the Redevelopment Agency of the City of Torrance, the City Council and each member thereof, members of boards and commissions, every officer, agent, official, employee and volunteer must be named as additional insureds under the automobile and general liability policies.

D. CONTRACTOR must provide certificates of insurance and/or endorsements to the City Clerk of the City of Torrance before the commencement of work.

E. Each insurance policy required by this Paragraph must contain a provision that no termination, cancellation or change of coverage can be made without thirty days notice to the CITY.

F. CONTRACTOR must include all subcontractors as insureds under its policies or must furnish separate certificates and endorsements for each subcontractor. All coverage for subcontractors will be subject to all of the requirements of this Paragraph 17.

18. SUFFICIENCY OF INSURERS

Insurance required by this Agreement will be satisfactory only if issued by companies admitted to do business in California, rated "B+" or better in the most recent edition of Best's Key Rating Guide, and only if they are of a financial category Class VII or better, unless these requirements are waived by the Risk Manager of the CITY ("Risk Manager") due to unique circumstances. In the event the Risk Manager determines that the work or services to be performed under this Agreement creates an increased or decreased risk of loss to the CITY, the CONTRACTOR agrees that the minimum limits of any insurance policies and/or the performance bond required by this Agreement may be changed accordingly upon receipt of written notice from the Risk Manager; provided that CONTRACTOR will have the right to appeal a determination of increased coverage by the Risk Manager to the City Council of the CITY within 10 days of receipt of notice from the Risk Manager.

19. CONFLICT OF INTEREST

A. No officer or employee of the CITY may have any financial interest, direct or indirect, in this Agreement, nor may any officer or employee participate in any decision relating to the Agreement that effects the officer or employee's financial interest or the financial interest of any corporation, partnership or association in which the officer or employee is, directly or indirectly interested, in violation of any law, rule or regulation.

B. No person may offer, give, or agree to give any officer or employee or former officer or employee, nor may any officer or employee solicit, demand, accept, or agree to accept from another person, a gratuity or an offer of employment in connection with any decision, approval, disapproval, recommendation, preparation or any part of a program requirement or a purchase request, influencing the content of any specification or procurement standard, rendering of advice, investigation, auditing,

or in any other advisory capacity in any way pertaining to any program requirement, contract or subcontract, or to any solicitation or proposal.

20. NOTICE

A. All notices, requests, demands, or other communications under this Agreement will be in writing. Notice will be sufficiently given for all purposes as follows:

1. Personal delivery. When personally delivered to the recipient: notice is effective on delivery.

2. First Class mail. When mailed first class to the last address of the recipient known to the party giving notice: notice is effective three mail delivery days after deposit in an United States Postal Service office or mailbox.

3. Certified mail. When mailed certified mail, return receipt requested: notice is effective on receipt, if delivery is confirmed by a return receipt.

4. Overnight delivery. When delivered by an overnight delivery service, charges prepaid or charged to the sender's account: notice is effective on delivery, if delivery is confirmed by the delivery service.

5. Facsimile transmission. When sent by fax to the last fax number of the recipient known to the party giving notice: notice is effective on receipt. Any notice given by fax will be deemed received on the next business day if it is received after 5:00 p.m. (recipient's time) or on a non-business day.

6. Addresses for purpose of giving notice are as follows:

CONTRACTOR: _____
_____
_____
_____
Fax: _____

CITY: City Clerk
City of Torrance
3031 Torrance Boulevard
Torrance, CA 90509-2970
Fax: (310) 618-2931

B. Any correctly addressed notice that is refused, unclaimed, or undeliverable because of an act or omission of the party to be notified, will be deemed effective as of the first date the notice was refused, unclaimed or deemed undeliverable by the postal authorities, messenger or overnight delivery service.

C. Either party may change its address or fax number by giving the other party notice of the change in any manner permitted by this Agreement.

21. PROHIBITION AGAINST ASSIGNMENT AND SUBCONTRACTING

This Agreement and all exhibits are binding on the heirs, successors, and assigns of the parties. The Agreement may not be assigned or subcontracted by either the CITY or CONTRACTOR without the prior written consent of the other.

22. INTEGRATION; AMENDMENT

This Agreement represents the entire understanding of the CITY and CONTRACTOR as to those matters contained in it. No prior oral or written understanding will be of any force or effect with respect to the terms of this Agreement. The Agreement may not be modified or altered except in writing signed by both parties.

23. INTERPRETATION

The terms of this Agreement should be construed in accordance with the meaning of the language used and should not be construed for or against either party by reason of the authorship of this Agreement or any other rule of construction that might otherwise apply.

24. SEVERABILITY

If any part of this Agreement is found to be in conflict with applicable laws, that part will be inoperative, null and void insofar as it is in conflict with any applicable laws, but the remainder of the Agreement will remain in full force and effect.

25. TIME OF ESSENCE

Time is of the essence in the performance of this Agreement.

26. GOVERNING LAW; JURISDICTION

This Agreement will be administered and interpreted under the laws of the State of California. Jurisdiction of any litigation arising from the Agreement will be in Los Angeles County, California.

27. COMPLIANCE WITH STATUTES AND REGULATIONS

CONTRACTOR will be knowledgeable of and will comply with all applicable federal, state, county and city statutes, rules, regulations, ordinances and orders.

28. WAIVER OF BREACH

No delay or omission in the exercise of any right or remedy by a nondefaulting party on any default will impair the right or remedy or be construed as a waiver. A party's consent or approval of any act by the other party requiring the party's consent or approval will not be deemed to waive or render unnecessary the other party's consent to or approval of any subsequent act. Any waiver by either party of any default must be in writing and will not be a waiver of any other default concerning the same or any other provision of this Agreement.

29. ATTORNEY'S FEES

Except as provided for in Paragraph 15, in any dispute, litigation, arbitration, or other proceeding by which one party either seeks to enforce its rights under this Agreement (whether in contract, tort or both) or seeks a declaration of any rights or obligations under this Agreement, the prevailing party will be awarded reasonable attorney's fees, together with any costs and expenses, to resolve the dispute and to enforce any judgment.

30. EXHIBITS

All exhibits identified in this Agreement are incorporated into the Agreement by this reference.

31. CONTRACTOR'S AUTHORITY TO EXECUTE

The persons executing this Agreement on behalf of the CONTRACTOR warrant that (i) the CONTRACTOR is duly organized and existing; (ii) they are duly authorized to execute this Agreement on behalf of the CONTRACTOR; (iii) by so executing this Agreement, the CONTRACTOR is formally bound to the provisions of this Agreement; and (iv) the entering into this Agreement does not
violate any provision of any other Agreement to which the CONTRACTOR is bound.

CITY OF TORRANCE,
a Municipal Corporation

_____

_____

_____
Frank Scotto, Mayor

By: _____

ATTEST:

_____
Sue Herbers, City Clerk

APPROVED AS TO FORM:

JOHN L. FELLOWS III
City Attorney

By: _____
(Name)
Deputy City Attorney

Attachments: Exhibit A: Bid

EXHIBIT A

Bid

[To be attached]

CITY OF TORRANCE
CONSTRUCTION OR SERVICE CONTRACT ENDORSEMENT

To be attached to and made a part of all policies insuring the liability of any person, form or corporation performing services under contract for the City of Torrance.

Not withstanding any inconsistent expression in the policy to which this endorsement is attached, or in any other endorsement now or hereafter attached thereto, or made a part thereof, the protection afforded by said policy shall:

1. Include the City of Torrance as an additional insured. (To include the elected officials, appointed officials, and employees.)

2. Indemnify and save harmless the City of Torrance against any and all claims resulting from the undertaking specified in the contract known as:

PROPOSAL, SPECIFICATIONS, BOND AND AFFIDAVIT
FOR THE CONSTRUCTION OF
Western Avenue and Rolling Hills Road Water Main Replacement Project CIP No. I-107, and Recycled Water Retrofits for Anza Avenue Medians and Parks Project, CIP No. I-78

B2012-01

This hold harmless assumption on the part of the underwriters shall include all costs of investigation and defense, including claims based on damage to substructures not shown, not located on the plans, or shown incorrectly.

3. Not be cancelled except by notice to the City Attorney of the City of Torrance at least thirty (30) days prior to the date of cancellation.

4. Provide single limit for Bodily Injury Liability and Property Damage Liability combined, $3,000,000 each Occurrence, and $5,000,000 Aggregate.

5. Limited classifications, restricting endorsements, exclusions or other special provisions contained in the policy shall not act to limit the benefits of coverage as they shall apply to the City of Torrance as enumerated in this endorsement. However, nothing herein contained shall affect any rights of the insurer against the insured.

6. It is further expressly agreed by and between the parties hereto that the following two provisions, (a) and (b), are a part of this contract:

   (a) That the Contractor specifically agrees to comply with applicable provisions of Section 1777.5 of the Labor Code relating to the employment by contractor or subcontractor under it, of journeyman or apprentices, or workmen, in any apprenticeable craft or trade.

   (b) By my signature hereunder, as Contractor, I certify that I am aware of the provisions of Section 3700 of the Labor Code which requires 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.

The limits of liability as stated in this endorsement apply to the insurance afforded by this endorsement notwithstanding that the policy may have lower limits of liability applying elsewhere in the policy.

_____
Duly Authorized Agent

Attached to and forming part of
Policy No. _____
of the _____

Date: _____
Expiration Date:_____

WORKERS' COMPENSATION INSURANCE CERTIFICATION

In compliance with Section 7-4 of the Standard Specifications, the Contractor shall complete and submit the following certification with a Certificate of Insurance before execution of the contract.

I am aware of, and will comply with, Section 3700 of the Labor Code, requiring every employer to be insured against liability for Workers' Compensation or to undertake self-insurance before commencing any of the work.

_____
CONTRACTOR

By: _____

Title:_____

SECTION E

SPECIAL PROVISIONS

The following Special Provisions supplement and amend the Standard Specifications for Public Works Construction (2009) and the Standard Specifications of the State of California Department of Transportation (Caltrans), latest edition, as noted herein. These Special Provisions have been arranged into a format that parallels the Standard Specifications for Public Works Construction.

SECTION E - SPECIAL PROVISIONS

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PART 1 - GENERAL PROVISIONS

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

1-2 DEFINITIONS. Add or redefine the following:

Agency – The City of Torrance, herein referred to as CITY.

Board – The City Council of the City of Torrance, herein referred to as City Council.

Engineer –The Public Works Director and/or City Engineer of the City of Torrance, acting either directly or through properly authorized agents, such agents acting within the scope of the particular duties entrusted to them.

Claim -- A separate demand by the Contractor for (A) a time extension, (B) payment of money or damages arising from work done by or on behalf of the Contractor pursuant to the Contract and payment of which is not otherwise expressly provided for or the claimant is not otherwise entitled to, or (C) an amount the payment of which is disputed by the Agency.

1-3 ABBREVIATIONS.

1-3.2 Common Usage:

Add the following abbreviations:

Approx	Approximate
CA	City Arborist
Exist.	Existing
L.A.C.D.P.W.	Los Angeles County Department of Public Works
Med.	Median
M.L.	Main Line
OH	Overhead
Ped.	Pedestrian
Reconst.	Reconstruct
Temp.	Temporary
Theo.	Theoretical
WM	Wire mesh or water meter

SECTION 2 - SCOPE AND CONTROL OF THE WORK

2-1 AWARD AND EXECUTION OF CONTRACT. Replace the entire subsection with the following:

Within ten (10) working days after the date of the CITY'S award of contract, the Contractor shall execute and return all Contract Documents required by the CITY. The CITY reserves the right to terminate the award if the above requirement is not met. Such termination will result in the forfeiture of the Proposal Guaranty.

The Contract shall not be considered binding upon the CITY until executed by the authorized CITY officials.

2-3 SUBCONTRACTS

2-3.2 Additional Responsibility. Replace the second sentence of the second paragraph with the following:

The following work will be considered as "Specialty Items":

2-4 CONTRACT BONDS. Revise the second sentence of the fourth paragraph to read as follows:

The "Performance Bond" shall remain in effect for one year following the date specified in the Notice of Completion or, if no Notice of Completion is recorded, for one year following the date of final acceptance by the Engineer.

2-5. PLANS AND SPECIFICATIONS.

2-5.1 General. Add the following sentence to the first paragraph to read as follows:

The Contractor shall maintain a control set of Plans and Specifications on the Work site at all times. All final locations determined in the field, and any deviations from the Plans and Specifications, shall be clearly marked in red on this control set to show as-built conditions. Upon completion of the Work, the Contractor shall submit the control set to the Engineer for approval. The red line mark ups shall be clear and legible, to the satisfaction of the Engineer. Final payment will not be made until this requirement is met.

Add the following subsections:

2-5.1.1 Plans. Included as part of the Contract Documents are the following, which show the location, character, dimensions or details of the Work:

1) Project Plans

The existing utility information and data provided with the Contract Documents are based on existing plans and documents. The plans and data are provided for information only. The Owner does not guarantee their accuracy and correctness. If the Bidder in preparing the Bid Proposal uses this information, the Bidder assumes all risks resulting from conditions differing from the information shown. The Bidder, in consideration for the information being provided, hereby releases the Owner and Consulting Engineer from any responsibility of obligation as to the accuracy of such information or for any additional compensation for work performed due to assumptions based on the use of such information.

2) Standard Plans

   a. City of Torrance Standard Plans, latest edition

   b. Standard Plans for Public Works Construction, latest edition, promulgated by Public Works Standards, Inc.

   c. Standard Plans of the State of California Department of Transportation (Caltrans), latest edition

   d. Standard Plans of the Los Angeles County Department of Public Works, latest edition

   e. American Water Works Association Standards, latest edition.

Applicable Standard Plans and information for this project are included in the Appendices of these Specifications.

2-5.1.2 Specifications. The Work shall be performed or executed in accordance with these Special Provisions and the following:

1) Standard Specifications for Public Works Construction, latest edition and supplements thereto, hereinafter referred to as the Standard Specifications, as written and promulgated by Public Works Standards, Inc. The Standard Specifications are published by BNi Building News, Inc., 1612 South Clementine Street, Anaheim, CA 92802, Phone: (800) 873-6397.

2) Sections 56-2, 84, 85, 86 and 90-10 of the State of California Department of Transportation (Caltrans) Standard Specifications, latest edition

3) American Water Works Association Standards, latest edition.

2-5.2 Precedence of Contract Documents. Replace the entire subsection with the following:

If there is a conflict between any of the Contract Documents, the document highest in precedence shall control. The order of precedence shall be as follows:

1) Permits issued by other agencies.
2) Change Orders (including Plans and Specifications attached thereto).
3) Public Works Agreement
4) Addenda
5) Special and General Provisions
6) Plans
7) City Standard Plans
8) Other Standard Plans
9) Standard Specifications for Public Works Construction
10) Reference Specifications

With reference to the Plans/Drawings, the order of precedence is as follows:

1) Change Order plans govern over Addenda and Contract plans
2) Addenda plans govern over Contract plans
3) Contract plans govern over standard plans

4) Detail plans govern over general plans
5) Figures govern over scaled dimensions

Within the Specifications, the order of precedence is as follows:

1) Change Orders
2) Permits from other agencies/Supplemental Agreements
3) Special Provisions
4) Instruction to Bidders
5) Referenced Standard Plans
6) Referenced Standard Specifications

If the Contractor, in the course of the Work, becomes aware of any claimed errors or omissions in the Contract Documents or in the CITY's fieldwork, the Contractor shall immediately inform the Engineer. The Engineer shall promptly review the matter, and if the Engineer finds an error or omission has been made the Engineer shall determine the corrective actions and advise the Contractor accordingly. If the corrective work associated with an error or omission increases or decreases the amount of work called for in the Contract, the CITY shall issue an appropriate Change Order in accordance with 3-3. After discovery of an error or omission by the Contractor, any related work performed by the Contractor shall be done at the Contractor's risk unless authorized by the Engineer.

2-5.3.4 Supporting Information. Add the following:

10) Ductile iron pipe, fittings and appurtenances

11) Pavement fabric, geotextile and crack sealer

12) Water main construction sequence

13) Water main appurtenances

14) Valves

15) Disinfection Plan

16) SWPPP

17) Jacking/Receiving Pits

18) Shoring

19) Traffic Control Plans for Recycled Water Retrofits

20) Asphalt Concrete and Crushed Aggregate Base

In addition to the above, submittals may be required for any product, manufactured item, or system not specifically listed above.

2-6 WORK TO BE DONE. Add the following:

The Work generally consists of the construction of 12-inch, 8-inch, and 6-inch waterlines, rehabilitation of two street sections, and traffic control as shown on City of Torrance Plan Nos. WP-

291 and ST-1041 (sheets 1 through X); curb, gutter, sidewalk, curb ramps, cross gutters; reconstruction, rehabilitation, reclamation of pavement; pavement preparation and application of cape and slurry seal and all other incidental work in this specification document.

2-9 SURVEYING.

2-9.2 Survey Service. Replace the entire subsection with the following:

All construction surveying necessary to complete the Work shown on the Plans and provided in these Contract Documents shall be accomplished by or under the direction of a Registered Land Surveyor or Registered Civil Engineer authorized to practice land surveying in the State of California, retained or provided by the Contractor. The CITY reserves the right to direct additional construction survey work to be performed at no additional cost when the City determines it is required to adequately construct the Work.

The Contractor shall notify the Engineer in writing at least 2 working days prior to the actual survey. The Contractor shall provide the traffic control necessary for construction surveying.

Stakes shall be set and stationed by the Contractor for curbs, curbs and gutters, sidewalks, access ramps, bus pads, driveways, headers, storm drains, sewers, cross gutters, spandrels, alley intersection, catch basin, rough grade, and other items as necessary. A corresponding cut or fill to finished grade (or flow line) shall be indicated on a grade sheet. A copy of each grade sheet shall be furnished to the Engineer. If any construction survey stakes are lost or disturbed and need to be replaced, such replacement shall be by the Contractor at its expense.

Construction stakes shall consist of the following:

a. Offset line and grade stakes for water at 50-foot intervals with grade sheets indicating cut to the pipe invert.

b. One set of control stakes for manholes and jacking pits.

c. One set of paving stakes.

d. Pipe heading checks for line and grade at each point of connection or tee.

The Contractor shall submit to the City within 2 days after completion of each respective survey, setting of each stake and heading check a copy of the survey notes and calculations certified by the licensed Land Surveyor for the following:

a. Level and horizontal control circuit for survey control.

b. Grade sheets for pipeline stakes.

c. Pipe heading checks.

All costs for construction survey staking including construction staking, professional services, office calculations, furnishing all labor, materials, equipment, tools and incidentals, and for doing all work involved shall be considered as included in the price for which such work is appurtenant thereto, and no additional allowance will be made therefor.

Payment for construction surveying shall be on a lump sum basis per the Contract Unit Price. When the Contract does not include a pay item for construction surveying as specified above, and unless otherwise provided in these Special Provisions, full compensation for construction surveying

required to complete the Work shall be included in the bid price for the appurtenant items of work.

2-10 AUTHORITY OF BOARD AND ENGINEER. Add the following:

Failure of the Contractor to comply with the requirements of the Contract Documents, or to follow the directions of the Engineer, and/or to immediately remedy such noncompliance or to follow directions, may, upon notice from the Engineer, result in the suspension of the Contract monthly progress payments. Any monthly progress payments so suspended may remain in suspension until the Contractor is in compliance with the Contract Documents and the directions of the Engineer, as determined by the Engineer.

2-11 INSPECTION. Replace the entire subsection with the following:

The Work is subject to inspection and approval by the Engineer. The Contractor shall notify the Engineer a minimum of 48 hours in advance of the required inspection.

The Engineer will make, or have made, such inspections and tests as he deems necessary to see that the Work is in conformance with the Contract Documents. In the event such inspections or tests reveal noncompliance with the Contract Documents, the Contractor shall bear the cost of such corrective measures as deemed necessary by the Engineer, as well as the cost of subsequent re-inspection and re-testing.

Work done in the absence of inspection by the Engineer may be required to be removed and replaced under the inspection of the Engineer, and the entire cost of removal and replacement, including the cost of all materials which may be furnished by the CITY and used in the work thus removed, shall be borne by the Contractor, regardless of whether the work removed is found to be defective or not. Work covered without the approval of the Engineer shall, if so directed by the Engineer, be uncovered to the extent required by the Engineer, and the Contractor shall similarly bear the entire cost of performing all the work and furnishing all the materials necessary for the removal of the covering and its subsequent replacement, including all costs for additional inspection.

The Engineer and any authorized representatives shall at all times have access to the Work during its construction at shops and yards as well as the Work site. The Contractor shall provide every reasonable facility for ascertaining that the materials and workmanship are in accordance with the Contract Documents.

Inspection of the Work shall not relieve the Contractor of the obligation to fulfill all conditions of the Contract.

Add the following subsections:

2-11.1 Special Inspection Fees. If the Contractor elects to work under this Contract more than 8 hours/day or more than 40 hours/week, Saturday, Sunday, or CITY holidays, the Contractor shall arrange with the Engineer for the required inspection service and pay the Special Inspection Fees which will be charged at the following rates:

Mondays through Fridays	-	$100.00 per hour
Saturdays, Sundays, Holidays	-	$1,000.00 per day

Fees may be deducted from payments due to the Contractor at the discretion of the Engineer.

If the Contractor works under this contract at times other than within the allowed working

hours without permission from or prior arrangement with the Engineer, the Contractor will be charged a lump sum amount of $500.00 for each occurrence, in addition to the above fees. The amount will be deducted from a Progress Payment.

2-11.2 Inspections During Construction. During the construction, the Contractor shall make the Work site available for periodic inspections by the regulatory agencies. These agencies may include: Los Angeles County Department of Health Services, Los Angeles Regional Water Quality Control Board, the State of California Department of Health Services Drinking Water Field Operations Branch, and CITY Water Department.

2-11.3 Material Inspection/Testing and other City Expenses.

(a) If a City subcontractor hired to perform material inspection and/or testing is required to work additional time to perform inspection and testing as a result of an action or delay caused by the Contractor, except for specific work allowed by the Engineer, the City subcontractor may charge the City an additional fee. The Engineer may deduct the additional fee for said inspection and testing from a Progress Payment to the Contractor. The Engineer also may deduct the cost to perform additional testing when an initial test fails to meet the requirements of this Contract. The typical rates for material testing and inspection are available upon request from the Public Works Department.

(b) If the Contractor does not comply with a requirement of these Special Provisions or if it does not immediately respond, after being informed, to a request by the Engineer to amend a site condition that jeopardizes the public health, safety or welfare, the Engineer may direct City staff to perform the work. For each occurrence, the City will charge the Contractor a base charge in the amount of $750 in addition to all costs incurred by the City for administration, labor, equipment and materials. The standard rates for City staff are available upon request from the Public Works Department.

(c) For each sign, drum, delineator, cone, barricade, warning device, or other type of required traffic control device that is not provided by the Contractor when required by the Traffic Control Plans, the Engineer may deduct $75 per day for each missing device from a Progress Payment. The Engineer, a City designate, or Public Works Inspector will inform the Contractor The deduction does not apply to a device that is fraudulently removed by non-construction personnel.

Add the following:

2-12 COORDINATION AND NOTIFICATIONS TO BUSINESSES OR RESIDENTS.

Prior to entering private property, Contractor shall provide written notices to each business or resident affected by the work. Any written communication to businesses or residents requires advance approval from the City. Contractor is to notify each business or resident of the proposed start of work date and estimated duration of work affecting said business or resident. In addition, Contractor shall be responsible to notify each business or resident of anticipated noise, odors, and access restrictions and shall coordinate with each business or resident to maintain access and security of the work site. Contractor also shall be responsible to notify in writing each affected resident or business prior to service interruption and to immediately notify residents and businesses upon resumption of service. Initial contact with private property owners shall be with the presence of the Inspector or Engineer.

SECTION 3 – CHANGES IN WORK

3-3 EXTRA WORK

3-3.1 General. Add the following:

Payment for additional work and all expenditures in excess of the Contract Price must be authorized in writing by the Engineer. Such authorization shall be obtained by the Contractor prior to engaging in additional work. It shall be the Contractor's sole responsibility to obtain written approval from the Engineer for any change(s) in material or in the work proposed by suppliers or subcontractors. No payment shall be made to the Contractor for additional work which has not been approved in writing, and the Contractor hereby agrees that it shall have no right to additional compensation for any work not so authorized.

The Contractor shall be responsible to provide all data and to obtain all approvals required by the Specifications, including submittal of Daily Extra Work Reports. No claims or extras shall be approved by the Engineer unless all work was done under the direction of and subject to the approval of the Engineer. Disputed work claims shall comply with 3-3 as modified herein.

3-3.2.2 Basis for Establishing Costs. Replace the second paragraph of part (c) with the following:

The Contractor will be paid for the use of equipment at the lower of the actual rental rates paid by the Contractor or the rental rates listed for such equipment in either the "Rental Rate Blue Book" published by Dataquest, Inc., 1290 Ridder Park Drive, San Jose, California 95131; telephone (408) 971-9000 or the California Department of Transportation publication entitled "Labor Surcharge and Equipment Rates" available at the Caltrans web site, www.dot.ca.gov/hq/eqsc/inforesources.htm , which is in effect on the date upon which the work is accomplished, and that hereby is made a part of the Contract, regardless of ownership or any rental or other agreement, if such may exist, for the use of such equipment entered into by the Contractor. If it is deemed necessary by the Engineer to use equipment not listed in the said publication, a suitable rental rate will be established by the Engineer. The Contractor may furnish any cost data that might assist the Engineer in the establishment of such rental rate.

3-3.2.3 Markup. Replace the entire subsection with the following:

The markups mentioned hereinafter shall include, but are not limited to, all costs for the services of superintendents, project managers, timekeepers and other personnel not working directly on the change order, and pickup or yard trucks used by the above personnel. These costs shall not be reported as labor or equipment elsewhere except when actually performing work directly on the change order and then shall only be reported at the labor classification of the work performed.

(a) Work by Contractor. The following percentages shall be added to the Contractor's costs and shall constitute the mark-up for all overhead and profit, which shall be deemed to include all items of expense not specifically designated as cost or equipment rental in Subsections 3-3.2.2(a), 3-3.2.2(b), and 3-3.2.2(c).

Labor	20
Materials	15
Equipment Rental	15
Other Expenditures	15

To the sum of the costs and markups provided for in this subsection, one (1) percent shall be added as compensation for bonding.

(b) Work by Subcontractor. When any part of the extra work is performed by a subcontractor, the markup established in 3-3.2.3(a) shall be applied to the subcontractor's actual cost of such work. A markup of ten (10) percent on the first $5,000 of the subcontracted portion of the extra work and a mark-up of 5 percent on work added in excess of $5,000 of the subcontracted portion of the extra work may be added by the Contractor.

The markups specified in parts (a) and (b) above shall be considered as including, but not limited to, the Contractor's labor costs for personnel not working directly on the extra work, including the cost of any tools and equipment that they may use. Such costs shall not be reported as labor or equipment costs elsewhere except when they are actually used in the performance of the extra work. Labor costs shall in that case be reported for the labor classification corresponding to the type and nature of extra work performed.

3-4 CHANGED CONDITIONS.

Add the following:

This subsection does not apply to utilities.

SECTION 4 – CONTROL OF MATERIALS

4-1 MATERIAL AND WORKMANSHIP.

4-1.1 General.

Add the following paragraph after the second paragraph:

If the work, or any portion thereof, shall be damaged in any way, or if any defective materials or faulty workmanship shall be discovered at any time prior to the final payment, the Contractor shall forthwith, at its own cost and expense, repair said damage, or replace such defective materials, or remedy such faulty workmanship in a manner satisfactory to the Engineer.

4-1.2 Protection of Work and Materials.

Add the following:

The Contractor shall assume all risks and expense of interference and delay in his operations, and the protection from or the repair of damage to improvements being built under the contract, as may be caused by water of whatever quantity from floods, storms, industrial waste, irrigation, underground or other sources. The Contractor shall also assume full responsibility and expense of protecting, or removing and returning to the site of Work, all equipment or materials under his care endangered by any action of the elements.

Furthermore, the Contractor shall indemnify and hold the City harmless from all claims or suits for damages arising from his operations in dewatering the Work and control of water.

SECTION 5 – UTILITIES

5-1 LOCATION. Add the following:

The Contractor shall provide coordination with all the utility companies involved and shall provide protection from damage to their facilities. The Contractor shall be responsible for repair or replacement to said facilities made necessary by its failure to provide required protection. The Contractor is required to include utility requirements in the Construction Schedule per Section 6-1.

The Contractor shall utilize the services of "Underground Service Alert-Southern California" for utility locating in all public right-of-ways by calling 1-800-227-2600 at least 48 hours prior to any excavation.

Pothole reports are available for review at the City. The new piping shall go over or under the existing utilities as indicated on the plans. Where not indicated, the Contractor shall assume that the new piping will cross under the existing utility. The Contractor shall pothole existing utilities as shown on the plans, as directed by the Engineer or as deemed necessary by the Contractor. The cost of potholing herein specified shall be included in the Contract Unit Price for MOBILIZATION/DEMOBILIZATION and no additional compensation will be allowed.

Where water lines exist, at each angle point, cross connection and "T" connection, the Contractor, for bidding purposes, shall assume the existence of a concrete thrust block located such as to resolve thrust loads. Any and all costs resulting from the existence of a thrust block, including costs for its removal and restoration if required, shall be deemed as being included in the prices bid for the various items of work.

Underground lines that are potentially hazardous such as oil company lines, natural gas mains, and electrical conduits will be carefully located by the owner of the utility as provided in the Standard Specifications. The Contractor shall take special precautions in determining the precise location and depth of these structures to insure that they will not be damaged by its operations.

Substitute the following for the last paragraph:

Prior to starting construction, the Contractor shall be responsible to determine the location and depth of all utilities which have been marked by the respective owners and which may affect or be affected by its operations. The Contractor also shall determine the location and depth of each service connection and lateral, whether or not marked. Full compensation for such work shall be considered as included in the prices bid for other items or work. If a utility which was marked or a service connection is found to interfere with the work after construction has commenced, the Contractor shall be solely responsible for all costs of any delay and for any costs which could have been avoided if the Contractor had located the utility prior to start of construction.

5-2 PROTECTION. Add the following:

If, in the course of construction, the Contractor damages a sewer lateral or water lateral, the Contractor shall be responsible to completely expose said lateral from the main line to the point of connection at private property to verify integrity of all joints to the satisfaction of the Engineer. This shall not be considered to be extra work and no extra costs shall be allowed therefor.

Sewers, including lateral repairs, shall be constructed of Vitrified Clay Pipe, unless otherwise approved in writing by the Engineer.

Add the following after the final paragraph:

As noted in subsections 5-2.1, 5-2.2 and 5-2.3 utilities are classified and are to be handled in one of three ways by the Contractor in the course of performing the contract.

5-2.1 Noninterfering Utilities

Utilities that are not abandoned by the owner and do not physically interfere with the permanent work in its final location shall be supported, protected and maintained in place by the Contractor, and the Contractor shall be solely responsible for any damage, loss or injury, or death resulting from his/her failure to do so and the Contractor shall indemnify and hold harmless the City from any and all such consequences. Noninterfering utilities may, with the permission of the owner and the Public Works Director, be relocated still farther from the permanent work in its final locations, but the Contractor shall not so consider, in submitting his bid, unless the relocation is shown on the plans.

5-2.2 Abandoned Utilities

Abandoned utilities are those portions of any utility which are no longer needed or desired by the owner and whose destruction is consented to by the owner and/or is permitted by notation on the plans. Abandoned utilities which physically interfere with the permanent work or with the construction thereof shall be removed by the Contractor and the Contractor shall be solely responsible for any damage, loss or injury, or death resulting from the removal and the Contractor shall indemnify and hold harmless the City from any and all such consequences.

5-2.3 Interfering Utilities

Any utility shall be deemed an interfering utility (1) which physically occupies any part of the space to be occupied by the permanent work in its final locations, or (2) whose length within the theoretical width of excavation for the permanent work exceeds five times the width of said theoretical excavation whether or not the utility physically interferes with the permanent work. Interfering utilities that are not abandoned by the owner shall be relocated so as not to interfere with the permanent work in its final location. Such relocation will be performed by the owner or the City unless otherwise shown on the plans.

The Contractor shall exercise caution to prevent damage to or movement of the utilities while constructing the permanent work along and adjacent to the utilities.

Should any manhole extend within a trench excavation, the Contractor shall choose one of the following methods of construction and shall assume all responsibilities thereof:

(1) Support and maintain the manholes in place during the construction of the permanent work in open cut.

(2) Remove the shaft and maintain the base of the manhole in place until the backfill is placed and compacted; then reconstruct the manhole shaft.

(3) Use another method of construction which has been submitted to and approved by the Engineer. All costs for the work pertaining to the manholes that might be found to extend partially within the excavation limits or any protective measures required due to the proximity of the manholes and the permanent work at these locations shall be absorbed in the prices bid for the various items of work.

5-2.4 Protection of Underground Hazardous Utilities. This Subsection shall apply to projects where there are underground utilities within the Work area which may be potentially hazardous if damaged. A hazardous substance shall be defined as one having the potential for an immediate disaster such as, but not limited to, gasoline, electricity, fuel oil, butane, propane, natural gas, chlorine or other chemicals.

Abandoned or inoperative utilities designed to carry hazardous substances and unidentified or unknown utilities shall be considered hazardous until determined otherwise. Whenever the Contractor is directed by the Engineer to tap these lines, the Contractor shall provide personnel specialized in this work and payment therefore will be considered as extra work per 3-3 of these Special Provisions.

The Contractor shall comply with the following requirements when working around underground hazardous utilities:

1) The Contractor shall not trench or excavate within the area where a utility known to carry a hazardous substance exists until its location has been determined by excavation or other proven methods acceptable to the Engineer. The intervals between exploratory excavations or location points shall be sufficient to determine the exact location of the line. Unless otherwise directed by the Engineer, excavation for underground hazardous utilities shall be performed by the Contractor and paid for as specified per 5-1 of these Special Provisions.

2) If it is determined that the horizontal or vertical clearance between the utility known to carry hazardous substances and the construction limit is less than 300 mm (12 inches) (450mm (18 inches) if scarifying), the Contractor shall confer with its owner. Unless the owner elects to relocate the line or take it out of service, the Contractor shall not excavate until the line has been completely exposed within the limits of construction.

3) Once the physical location of the utility known to carry hazardous substances has been determined, the Contractor, in cooperation with and with the concurrence of the utility owner, shall determine how to protect and/or support the utility from damage before proceeding with the Work.

4) During all excavation and trenching operations, the Contractor shall exercise extreme caution and protect the utilities from damage.

5) The Contractor shall notify the Engineer, the public agency maintaining records for the jurisdiction in which the Project is located and the owner, if known, whenever previously unidentified or unknown underground utilities are encountered so that the location can be accurately established and made a part of permanent substructure records.

Full compensation for protecting underground hazardous utilities as specified or noted on the Plans shall be considered as included in the prices bid for the various items of work.

5-3 REMOVAL.

Add the following:

It shall be the Contractor's responsibility irrespective of the notations on the plans to confirm or determine that a utility is to be abandoned before treating the same as an abandoned utility and shall assume all risks in so determining.

5-4 RELOCATION.

Add the following:

Prior to any relocation work being performed that is not specifically called out on the Plans, the Contractor shall first be authorized by the Engineer.

Fire hydrants shall be replaced by Contractor per City of Torrance Standard Plan T705 or T706 as directed by the Engineer, unless otherwise shown on the plans.

Water meters shall be replaced by Contractor per City of Torrance Standard Plan T703 or T704 as directed by the Engineer, unless otherwise shown on the plans.

Substitute the following for the last paragraph:

For the purpose of these specifications, service connections shall be construed to mean all, or any portion of, the pipe, conduit, cable, or duct which connects a utility main distribution line to the meter of an individual user, and further, shall include the meter and such portions of said pipe, conduit, cable or duct on the user's side of the meter which affect the contract work or its prosecution.

The City will arrange for the alteration or permanent relocation of only such service connections, except sewer house connections and water laterals, that interfere with the permanent work in its final location and such alteration or permanent relocation will be performed by others at no expense to the Contractor. The Contractor shall be responsible for the alteration or permanent relocation of sewer connections and water laterals, unless otherwise approved by the Engineer or shown on the plans.

Service connections which do not interfere with the project shall be maintained in place by the Contractor. The cost of such work shall be absorbed in the unit prices or included in the lump sum amounts bid for the various items of work.

5-5 DELAYS.

Substitute the following:

If the contractor while performing the contract discovers utility facilities not identified by the public agency in the contract plans or specifications, he shall immediately notify the City and utility in writing. The Contractor shall not be entitled to damage or additional payment, nor shall it be entitled to standby time for labor if a delay does occur. The Contractor also shall not be entitled to damage or additional payment for equipment not on the project during the occurrence of the event that caused the related delay. The Engineer will determine the extent of the delay attributable to such interferences, the affect of the delay on the project as a whole, and any commensurate extension of time.

Any failure of the City and/or utility company to accomplish relocations in a reasonable manner in light of the Contractor's operations (to the extent such operations would otherwise be feasible and in accordance with the contract and as disclosed to the City prior to the Contractor encountering any such utility) shall entitle the Contractor to an extension of contract time to the extent that, in the judgment of the Engineer, the Contractor's completion of the overall contract work has been delayed; however, the Contractor shall be entitled to no other remedy and, in submitting its bid, thereby waives such other remedies, if any, unless the relocation delay is the result of arbitrary, capricious or malicious conduct by the City.

SECTION 6 - PROSECUTION, PROGRESS AND ACCEPTANCE OF THE WORK

6-1 CONSTRUCTION SCHEDULE AND COMMENCEMENT OF WORK. Replace the entire subsection with the following:

6-1.1 General. Within ten (10) working days after the date of the CITY's execution of the Contract, the Contractor shall submit a proposed construction schedule to the Engineer for approval. The schedule shall be in accordance with 6-1.2 and 6-1.3 and shall be in sufficient detail to show chronological relationship of all activities of the Work. These include, but are not limited to: estimated starting and completion dates of various activities, submittal of shop drawings to the Engineer for approval, procurement of materials and scheduling of equipment.

Prior to issuing the Notice to Proceed, the Engineer will schedule a Pre-Construction Meeting with the Contractor to review the proposed construction schedule and delivery dates, arrange utility coordination and clarify inspection procedures.

Prior to starting any Work, the Contractor shall attend a Community Meeting to be scheduled by the Engineer. The meeting, to be held in the evening, will address the residents' questions and concerns regarding the Work, what can be expected during construction and vehicular and pedestrian access that may be temporarily restricted during construction.

Notwithstanding any other provisions of the Contract, the Contractor shall not be obligated to perform any work and the CITY shall not be obligated to accept or pay for any work performed by the Contractor prior to delivery of a Notice to Proceed. The CITY's knowledge of work being performed prior to delivery of the Notice to Proceed shall not obligate the CITY to accept or pay for such work. The Contractor shall provide all required Contract bonds and evidences of insurance prior to commencing work at the site.

6-1.2 Criteria. The construction schedule shall conform to the following criteria:

1) The schedule shall be prepared using the latest version of Primavera, Microsoft Project or approved equal.

2) Work activities shall be based on the items of work per 2-6, and the following:

   a) Contract Unit Price items shall be subdivided into those portions to be constructed during each stage or phase of construction.

   b) Lump sum items shall be subdivided into those portions to be constructed during each stage or phase of construction.

3) Utility relocations in coordination with the Contractor per 5-4 of these Special Provisions shall be considered as activities.

4) Required submittals, working and shop drawings shall be included as activities.

5) The procurement of construction materials and equipment with long lead times for deliveries shall be included as activities.

6) Work to be performed by subcontractors shall be identified and shown as work activities.

7) Start and completion dates of each activity shall be illustrated.

8) Completion of all Work under the Contract shall be within the time specified in 6-7 of these Special Provisions and in accordance with the Plans and Specifications.

6-1.3 Requirements. In preparing the construction schedule, the following items shall be considered:

Sequence of Construction - The Contractor shall sequence the Work in a manner to expeditiously complete the project with a minimum of inconvenience to the adjacent owners and to conform to the following:

1. **The Contractor may not begin full street width pavement reconstruction activities until it has completed the installation of new water mains, all new PCC improvements (i.e. curb/gutter, cross gutters, sidewalk, driveways, curb ramps, etc.) for the entire project.**

2. Concrete removal - All concrete removed shall be hauled off the Work site (including the Contractor's storage yard) no later than the calendar day following the day that the removal is performed. If the calendar day following the removal is a non-working day (Saturday, etc.) the concrete shall be hauled off the Work site on the same day it was removed. Unless otherwise authorized by the Engineer, failure by the Contractor to haul concrete from the Work site and/or Contractor's storage yard(s) in a timely manner may result in a liquidated damage assessed upon the Contractor. Such liquidated damage shall be determined by the Engineer and will be deducted, accordingly, from a Progress Payment due to the Contractor.

3. PCC construction - Construction of PCC sidewalks, driveways, access ramps, curbs, gutters and cross gutters shall be formed and poured within 5 working days following removal of the existing material at any location. Any adjacent trench (i.e. 1-foot wide slot trench), required to remove and construct said PCC construction shall be restored per these Specifications and no later than 2 calendar days following the PCC construction. Failure by the Contractor to comply with these requirements in a timely manner may result in a liquidated damage assessed upon the Contractor. Such liquidated damage shall be determined by the Engineer and will be deducted, accordingly, from a Progress Payment due to the Contractor.

4. Water main installation and all its related activities shall be completed in its entirety for Western Avenue as the first order of the work. Only after completing the water main installation to the full satisfaction of the Engineer may the Contractor proceed with the other street rehabilitation. Cross gutters may be constructed after the adjacent water main installation work has been completed.

5. The contractor is required to construct the new pipelines and pavement in separate phases. The preferred sequence of the three phases is at the Engineer's discretion and will be determined after the award of this Contract. **Refer to the Traffic Control Plans for additional requirements and sequencing of construction**. Accordingly, the Contractor is required to provide and maintain temporary striping and/or reflectorized yellow and white tabbing in the completed phase until such permanent thermoplastic paint is applied.

6. Pavement removal - All pavement removed as a result of trenching shall be hauled off the Work site no later than the same day that the removal is performed.

7. Within 4 working days following the installation of the final surface course in any Phase, the Contractor shall complete the adjustment of all manholes, valves and any other required surface facilities.

8. Within 5 working days following the installation of the final surface course in any Phase, the Contractor shall complete the "cat-tracking" of all proposed pavement markings shown on the Plans. The City will inspect all "cat-tracking" within 2 working days and notify the Contractor of any needed corrections or adjustments. Upon approval of the "cat-tracking" by the Engineer, the Contractor shall then complete the installation of all thermoplastic pavement markings no earlier than 7 calendar days following the installation of the final surface course in any Phase, but under no circumstances no later than 10 calendar days following the installation of the final surface course in any Phase.

9. All new traffic detector loops shall be installed PRIOR to the installation of permanent thermoplastic pavement markings.

10. Tree and Stump removals per 300-1.3.2(d) are to be performed before concrete removals.

11. Irrigation systems - Irrigation systems disrupted by the Contractor shall not be left inoperable for more than three working days.

12. Subsection 307-1.3 regarding the ordering of materials.

13. The Contractor may proceed with the pavement construction work after the completion of the water mains and concrete work as listed above.

14. All Work shall only be performed between the hours of the following unless otherwise approved by the Engineer or required by Caltrans:

    - 9:00 a.m. and 3:00 p.m. on Western Avenue
    - 9:00 p.m. and 5:00 a.m. at Western Avenue / 190th Street Intersection
    - 24-hour operation is acceptable for jack and bore on Western Avenue
    - 8:30 a.m. and 3:30 p.m. on Crenshaw Boulevard
    - 7:30 a.m. and 3:30 p.m. on Rolling Hills Road and residential streets within the City
    - Night work hours are allowed for portions of the project. Please see Traffic Control Plans.

15. A move-in period of 10 calendar days will be allowed starting on the date in the Notice to Proceed.

16. Holiday Moratorium per 7-10.1.6. of these Special Provisions.

17. Trash collection. Trash collection days are established and will not be changed. If a street or streets are scheduled for rehabilitation, cap or slurry sealing on a pick-up day, the Contractor shall wait until the refuse and recycling vehicles have completed their runs on that street. Further, the City requires a 24-hour cure period prior to a trash pick-up day. (For example, if Tuesday is the collection day for the streets in this contract, cape or slurry sealing in this area is allowed on Mondays until 10:00 a.m. It is also allowed on Tuesday <u>after</u> the refuse and recycling trucks have passed.)

    Private waste haulers serve customers along Western Avenue and Rolling Hills Road. It is the Contractor's responsibility to coordinate their work efforts with the waste haulers.

18. Stockpile area. Schedule shall indicate date for cleanup of stockpile area.

Should the Contractor fail to meet Requirements of Section 6-1.3, the Engineer reserves the right to prohibit the Contractor from making further removals until the clean up, construction, or rehabilitation of sprinklers is in conformance with the aforementioned requirements. Furthermore, if after notice is given to the Contractor to perform work to meet these requirements, and the Contractor refuses or for any reason fails to perform sufficiently to meet these schedules, CITY may perform said work and charge the Contractor for all costs incurred.

6-1.4 Updates. The Contractor shall submit 2 paper copies of the updated construction schedule to the Engineer on the first working day of each month along with approved Progress Payment request.

If the Contractor decides to make a major change in the method of operations after commencing construction, or if the schedule fails to reflect the actual progress, the Contractor shall submit to the Engineer a revised construction schedule in advance of beginning revised operations.

Full compensation for complying with all requirements of Section 6-1.4 Updates shall included in various items of work. If the Contractor fails to submit an updated Construction Schedule to the Engineer on the first working day of each month, the CITY will deduct $300 for each work day after the due date, that each monthly schedule update is not submitted.

6-7 TIME OF COMPLETION.

6-7.1 General. Replace the first sentence with the following:

Time shall be of the essence in the Contract. The Contractor shall begin Work after the mailing by the Engineer to the Contractor, first class mail, postage prepaid, a Notice to Proceed and shall diligently prosecute the same to completion within **130** working days from the start date specified in the Notice to Proceed.

6-8 COMPLETION, ACCEPTANCE AND WARRANTY. Replace the second paragraph with the following:

If, in the Engineer's judgment, the Work has been completed and is ready for acceptance, the Engineer will so certify and will determine the date when the Work was completed. This will be the date when the Contractor is relieved from responsibility to protect the Work. The Engineer may cause a Notice of Completion to be filed and recorded with the Los Angeles County Recorder's Office. At the Engineer's option, the Engineer may certify acceptance to the City Council who may then cause a Notice of Completion to be filed and recorded with the Los Angeles County Recorder's Office.

Add the following subsection:

6-8.1 Manufacturer's Warranties. Manufacturer's warranties shall not relieve the Contractor of liability under these Specifications. Such warranties only shall supplement the Contractor's responsibility.

The Engineer may, at his option, require a manufacturer's warranty on any product offered for use.

6-9 LIQUIDATED DAMAGES. In each of the two paragraphs, substitute "$1,000" in place of "$250" as the amount of the liquidated damages per each consecutive calendar day.

6-11 SEQUENCE OF CONSTRUCTION

6-11.1 Multiple Headings. In order to meet the contract schedule, the Contractor will be allowed to initiate and maintain two or more construction headings. However, the Contractor will not be allowed to have multiple phases of work occurring that have the corresponding traffic control devices in conflict with each other.

6-11.2 Sequencing Fire Hydrant Construction to Maintain Water Service. The proposed fire hydrants and large meter replacements will need to be sequenced in order to maintain water service to the project area. The sequencing will need to be coordinated with the Water Division a minimum of two weeks prior to beginning any connections and/or shut downs of the existing water mains. Due to the availability of City personnel, no more than one set of valves may be shut off at any one time under this contract.

6-11.3 Sequencing Construction to Maintain Water Service. The proposed water main replacements will need to be sequenced in order to maintain water service to the project area. The sequencing will need to be coordinated with the City a minimum of seven calendar days prior to beginning any connections and/or shut downs of existing water mains. For each phase in the construction Schedule, the Contractor shall provide sequencing details on; water main construction and connection to existing system, required valve shutdown, pressure testing and disinfection plan, service reconnections, hydrant construction phasing, and abandonment of existing system. The sequencing plan shall be approved by the Water Division prior to commencement of construction. Due to the availability of City personnel, no more than one set of valves may be shut off at any one time under this control.

6-11.4 Isolations of Existing Water Mains. The valve closures required to isolate the existing water mains for the proposed connections, shall only be performed by the Torrance Municipal Water Department. A 48-hour notice is required for the operations of any valve.

During the isolation of the existing water mains of the proposed connections, the Contractor shall maintain the supply of water to customers at all times except for the time to make the necessary connections to the existing mains. This shut down will occur at an agreed upon time. A four-hour shut down of water facilities shall be done during the daytime hours of 10:00 a.m. to 2:00 p.m. or a six-hour shut down between the hours of 11:00 p.m. to 5:00 a.m. will be allowed except where noted on the construction plans. The contractor shall maintain adequate fire protection at all times during the construction of the project. It is the Contractor's responsibility to provide advance notification to and coordinate the construction with the local fire department. Several of the proposed connections will require the isolation of existing water main outside of the limits shown on the construction plans.

6-11.5 Recycled Water Retrofits. Construction of the Recycled Water Retrofits for the Anza Avenue Medians and Parks shall be the last item of work. Contractor shall meet with WBMD and City of Torrance Project Managers to verify the completion of WBMD pump station before work on the retrofits can begin.

SECTION 7 - RESPONSIBILITIES OF THE CONTRACTOR

7.2 LABOR

Add the following subsections:

7-2.3 Payrolls and Payroll Records

Any payroll and payroll records required for this project shall be submitted, for each week in which any contract work is performed, to the Engineer. A retention of $5,000 per report per pay period will be withheld from a progress payment for a late or missing report. A report shall be deemed as late or missing when not submitted to the Engineer within 10 calendar days from the close of the pay period for which the report applies. In addition, a non-refundable deduction of $100 per report per day will be deducted from payments due the Contractor for each late or missing report. The $100 non-refundable deduction per day will be incurred beginning on the first day the report is late or missing.

7-2.4 Subcontractor and DBE Records

At the completion of the contract if the Contractor does not submit its Subcontractor and DBE Records to the Engineer a retention in the amount of $10,000 per record will be withheld from a progress payment for a late or missing record. A record shall be deemed as late or missing when not submitted to the Engineer within 15 calendar days from the completion of the contract. In addition, a non-refundable deduction of $300 per record per day will be deducted from payments due the Contractor for each late or missing record. The $300 non-refundable deduction per day will be incurred beginning on the first day the record is late or missing.

7-3 LIABILITY INSURANCE. Replace the second sentence of the second paragraph with the following:

The Contractor must maintain at its sole expense the following insurance, which will be full coverage not subject to self-insurance provisions:

1) Automobile Liability, including owned, non-owned and hired vehicles, with at least the following limits of liability:

   a). Combined single limits of $2,000,000 per occurrence.

2) General Liability including coverage for premises, products and completed operations, independent contractors, personal injury and contractual obligations with combined single limits of coverage of at least $3,000,000 per occurrence, with an annual aggregate of no less than $5,000,000.

Add the following:

The Contractor must include all subcontractors as insureds under its policies or must furnish separate certificates and endorsements for each subcontractor.

7-4 WORKER'S COMPENSATION INSURANCE. Add the following after the first sentence of the second paragraph:

Worker's Compensation Insurance shall be with limits as required by the State of California and Employer's Liability with limits of $3,000,000 per accident.

7-5 PERMITS. Replace the second paragraph with the following:

The Contractor shall obtain a City of Torrance Business License and a no-fee Construction Excavation Permit before commencing construction. The Contractor shall obtain no-fee Electrical and Plumbing permits from the Building and Safety Department before commencing installation of new electrical services or on-site irrigation systems, as applicable.

Full compensation for complying with the above requirements shall be included in the Contract Unit Price for Permits and Fees.

Add the following subsections:

7-5.1 State Encroachment Permit. A State of California Department of Transportation (Caltrans) Encroachment Permit has been obtained by the CITY and is included in Appendix III. However, the Contractor shall submit to Caltrans, a signed application requesting a separate permit authorizing the Contractor to perform the work within Caltrans right-of-way for the CITY. The Contractor shall pay all charges, fees and bonds for this permit. The application shall be made to the State of California, Department of Transportation, 120 South Spring Street, Los Angeles, CA 90012, telephone (213) 897-3631.

Full compensation for complying with the above requirements shall be considered as included in the lump sum price for CALTRANS AND LACDPW PERMIT AND FEES. However, this is not the amount that will be paid to the Contractor. The amount that shall be paid to the Contractor shall be the actual permit and inspection fees paid to the State with no mark-up or extra costs, except the Contractor shall be solely responsible for any fee charged to re-inspect rejected or incomplete work.

Unless otherwise authorized by the State Encroachment Permit, all work within Caltrans Right-of-Way shall be performed in accordance with the latest State of California Department of Transportation Standard Specifications and said permit.

7-5.2 Los Angeles County Department of Public Works Permit. A permit is required from the Los Angeles County Department of Public Works ("LACDPW") and must be obtained by the contractor, instead of the City. The Contractor shall pay all charges, fees and bonds for this permit.

Full compensation for complying with the above requirements shall be considered as included in the lump sum price for CALTRANS AND LACDPW PERMIT AND FEES. However, this is not the amount that will be paid to the Contractor. The amount that shall be paid to the Contractor shall be the actual permit and inspection fees paid to the LACDPW with no mark-up or extra costs, except the Contractor shall be solely responsible for any fee charged to re-inspect rejected or incomplete work.

Unless otherwise authorized by the LACDPW Permit and approved plan, all storm drain work shall be performed in accordance with these Specifications and Special Provisions.

7-6 THE CONTRACTOR'S REPRESENTATIVE

Add a third paragraph to the section stating the following:

The Contractor's Representative shall be approved by the CITY prior to the start of the Work. If the designated representative is rejected, the Contractor shall immediately designate another representative in writing and submit to the City for consideration. The CITY shall have the authority to require the Contractor to remove its representative and/or alternate representative at any time and at no cost to the CITY.

7-8 WORK SITE MAINTENANCE.

7-8.1 General. The second paragraph is amended to read:

Unless directed otherwise by the Engineer, the Contractor shall furnish and operate a self-loading motor sweeper with spray nozzles at least once each working day to keep paved areas acceptably clean to the City whenever construction, including restoration, is incomplete.

The Contractor shall obtain a construction water meter from the CITY by calling Torrance Customer Service Operations ("CSO") at (310) 921-6449. A $1,000 deposit is required and refundable upon return of the meter in good working condition. The Contractor shall pay for the water used, at the CITY's current water rates.

Some water mains in Torrance are owned/operated by California Water Service Company (CWSC). For rental of a hydrant meter the contractor shall call California Water Service Company at (310) 257-1400.

7-8.6 Water Pollution Control. Add the following:

7-8.6.1 NPDES General Permit, Notice of Intent (NOI) and Notice of Termination (NOT).

Construction activities including clearing, grading and excavating that result in land disturbances of equal to or greater than one acre are covered by the National Pollutant Discharge Elimination System General Construction Permit, State Water Board Order No. 2009-0009-DWQ. Discharges obtaining coverage will file electronically for coverage under Order No. 2009-0009-DWQ. Order No. 2009-0009-DWQ is a Risk Based permitting approach. The Contractor is required to go to the State Water Resources Control Board website and determine risk level and apply for permit and update permit using the Storm Water Multiple Application and Reporting Tracking System (SMARTS). The SMARTS system is an online tool for submitting Notice of Intent (NOI), Notice of Termination (NOT), compliance and monitoring data and Annual Reports when required. See **http://www.swrcb.ca.gov/water_issues/programs/stormwater/constpermits.shtml**

Order No. 2009-0009-DWQ includes, in Attachment A, requirements for all Linear Underground/Overhead Projects (LUPs) that are covered under the Small LUP General Permit 2003-007-DWQ. LUPs will be broken into project segments designated as LUP Type 1, Type 2, and Type 3. These LUP Types are analogous to the risks levels for traditional construction projects.

This General Construction Permit regulates pollutants in discharges of storm water associated with construction activity. To obtain authorization for proposed storm water discharges, pursuant to this General Construction Permit, the Contractor must submit using the SMARTS system to submit NOI and pay the appropriate fee to the State Regional Water Quality Control Board (SWQCB). Contractor shall provide to the City a Storm Water Pollution Prevention Plan (SWPPP). The Contractor Shall terminate coverage under General Construction Permit for a complete project by submitting a NOT via the SMARTS system after post construction storm water Best Management Practices (BMPs) are in place and approved by the City.

In addition the Contractor is required by the State Water Resource Control Board to prepare a Caltrans Water Pollution Prevention Program (WPCP) for this project. The WPCP shall incorporate the latest revision (July 8, 2011 Template) and an Erosion and Sedimentation Control Plan shall also be included in the WPCP and be submitted in a 3-ring binder with dividers and tabs to the Storm Water Coordinator, Caltrans District 07- Permits Office, 100 South Main Street, Los Angeles, CA 90012. The WPCP can be downloaded from **http://www.dot.ca.gov/hq/construs/stormwater/stormwater1.htm.** For guidance please refer to the SWPPP-WPCP Preparation Manual 2011 also found at the link above. The Contractor shall sign and certify the WPCP after he/she has been awarded the contract.

Full compensation for preparation of the NOI, NOT, WPCP, required fees, construction, and post construction BMPs, sampling, analysis and reporting as required by Order No. 2009-0009-DWQ and all other related costs shall be considered as included in the bid for NPDES COMPLIANCE.

7-8.6.2 Best Management Practices (BMPs).

Add the following: Best Management Practices shall be defined as any program, technology, process, siting criteria, operating method, measure, or device which controls, prevents, removes, or reduces pollution. The Contractor shall obtain and refer to the California Storm Water Best Management Practice Handbooks, Volume 3 Construction BMP Handbook and the Los Angeles County Department of Public Works Best Management Practices Handbook for Construction Activities. These publications are available from:

Los Angeles County
Department of Public Works
Cashier's Office
900 S. Fremont Avenue
Alhambra, CA 91803
Telephone (626) 458-6959

The Contractor shall have a minimum of two (2) readily accessible copies of each publication on the Work site at all times.

The Contractor shall implement BMPs in conjunction with the following construction operation and activities:

CONSTRUCTION PRACTICES	Clearing, Grading and Excavating
	Water Conservation Practices
	Dewatering
	Paving Operations
	Structure Construction and Painting
MATERIAL MANAGEMENT	Material Delivery and Storage
	Material Use
	Spill Prevention and Control
WASTE MANAGEMENT	Solid Waste Management
	Hazardous Waste Management
	Contaminated Soil Management
	Concrete Waste Management
	Sanitary/Septic Waste Management
VEHICLE AND EQUIPMENT MANAGEMENT	Vehicle and Equipment Cleaning
	Vehicle and Equipment Fueling
	Vehicle and Equipment Maintenance

The Contractor shall implement the following BMPs in conjunction with the previously listed construction operation activities:

VEGETATIVE STABILIZATION	Scheduling of Planting
	Preservation of Existing Vegetation
	Temporary Seeding and Planting
	Mulching
PHYSICAL STABILIZATION	Geotextiles and Mats
	Soil Stabilizer/Dust Control
	Temporary Stream Crossing
	Stabilized Construction Roadway
	Stabilized Construction Entrance
RUNOFF DIVERSION	Sodding, Grass Plugging, and Vegetative Buffer strips
	Earth Dikes, Drainage Swales, and Lined Ditches
	Top and Toe of Slope Diversion Ditches/Berms
	Slope Drains and Subsurface Drains

VELOCITY REDUCTION	Flared Culvert End Sections
	Outlet Prottection/Velocity Dissipation Devices
	Check Dams
	Slope Roughening/Terracing/Rounding
SEDIMENT TRAPPING	Slit Fences
	Straw Bale Barrier
	Sand Bag Barrier
	Brush or Rock Filter
	Storm Drain Inlet Protection
	Sediment Traps
	Sediment Basin

Additional BMPs may be required as a result of a change in actual field conditions, contractor activities, or construction operations. When more than one BMP is listed under each specific BMP category, the Contractor shall select the appropriate and necessary number of BMPs within each category in order to achieve the BMP objective.

BMPs for contractor activities shall be continuously implemented throughout the year. BMPs for erosion control and sedimentation shall be implemented during the period from October 15 to April 15, and whenever the National Weather Service predicts rain within 24 hours. BMPs for erosion control and sedimentation shall also be implemented prior to the commencement of any contractor activity or construction operation that may produce run-off, and whenever run-off from other sources may occur.

The CITY, as a permittee, is subject to enforcement actions by the State Water Resources Control Board, the Environmental Protection Agency and private citizens. The CITY may assess the Contractor a penalty of $1,000 for each calendar day that the Contractor has not fully implemented the appropriate BMPs and/or is otherwise in noncompliance with these provisions. In addition, the CITY will deduct, from the final payment due the Contractor, the total amount of any fines levied on the CITY, plus legal and staff costs, as a result of the Contractor's lack of

compliance with these provisions and/or less than complete implementation of the appropriate BMPs.

Full compensation for the implementation of BMPs, including the construction, removal, and the furnishing of all necessary labor, equipment, and materials, shall be considered as included in the price bid for NPDES COMPLIANCE and BMPs.

Add the following subsections:

7-8.8 Contractor's Storage Yard. The Contractor shall be responsible for obtaining a storage yard for the duration of the Work. If the proposed location of the yard is located within the boundaries of the CITY, the Contractor shall obtain prior approval from the Engineer.

7-8.9 Graffiti Removal. The Contractor shall maintain the Work, all of its equipment, and all traffic control devices, including signage, free of graffiti throughout the duration of the Contract. The Contractor shall respond to any request from the Engineer to remove graffiti within 4 hours of notification. Should the Contractor fail to respond to such request, the CITY reserves the right to make other arrangements for the requested graffiti removal and deduct the cost from any monies due the Contractor.

7-9 PROTECTION AND RESTORATION OF EXISTING IMPROVEMENTS.

Add the following paragraph:

The Contractor shall be responsible to protect all new concrete work from being etched, scratched or otherwise marked or having wet slough material deposited thereon. If new concrete work is marked, the Contractor shall replace it at its expense in accordance with 303-5.7 of these special provisions.

The Contractor shall perform all private lawn, hardscape, and parkway restorations, (not included in the project plans) including restoration of irrigation systems and existing curb drains within five (5) days after the adjacent improvements have been constructed at his own expense. The Contractor shall <u>not</u> delay restorations for tree plantings.

Add the following subsections:

7-9.1 Replacement of Lawns. When the Contract requires the removal and replacement of lawns or sod, including parkways, the Contractor shall comply with the following minimum requirements: the area to be replanted shall be regraded and covered with two inches of an approved topsoil; the grass seed or sod shall be for grass or sod of the same type as was removed, or an approved equal, and grass shall be sown at the rate recommended by the seed distributing company; Bandini steer manure or approved equal shall be applied to the planted area at the rate recommended by the vendor. The Contractor shall water and care for replaced lawns until the grass has attained a complete cover and has been given its first cutting, unless other arrangements are made with the property owners. The lawn restoration, as above described, shall be completed prior to the final payment.

Topsoil shall be in accordance with 212-1.1.

7-9.2 Replacement of Sprinkler Systems. Damaged sprinklers shall be replaced so that the area watered by the original system will be adequately watered by the reconstructed system without undue waste of water. Overspray on any area no longer planted should be avoided, and

any revised shape or layout of the remaining planted area will be adequately watered. Any additional material or work required to obtain said adequate coverage shall be furnished by the Contractor, at its expense. The Contractor shall be responsible to replace any lawn or plant damaged from lack of irrigation resulting from the Contractor's operations, at its expense, to the satisfaction of the Engineer.

7-9.3 Parkway Trees. The Contractor shall exercise all necessary precautions so as not to damage or destroy any trees or shrubs and shall not trim or remove any trees unless such trees have been approved for trimming or removal by the Engineer. All existing trees and shrubs that are damaged during construction shall be trimmed or replaced by the Contractor or a certified tree company to the satisfaction of the Engineer. Tree trimming and replacement shall be accomplished in accordance with the following requirements:

(a) Trimming. Symmetry of the tree shall be preserved; no stubs, splits torn branches or torn roots left; clean cuts to be made close to trunk or large branch. Spikes shall not be used for climbing live trees. All cuts over one and one-half inches in diameter shall be coated with a suitable tree wound paint as approved by the Engineer.

(b) Replacement. The Contractor shall immediately notify the Engineer if any tree is damaged by its operations. If, in the opinion of the Engineer, the damage is such that replacement is necessary, the Contractor shall replace the tree at its own expense. The tree shall be of a like variety as the tree damaged, subject to the approval of the Engineer. The size of the tree shall be the size of the tree replaced or 3" in diameter, whichever is smaller.

7-9.4 Street Furniture. The Contractor shall be responsible for removal, storage and replacement of trash receptacles, bus benches, bus enclosures, newspaper boxes, mail boxes, etc. and coordination with the Owners as required throughout construction. Replacement of the removed items shall be per the direction of the Owner or Engineer.

7-9.5 Protection of Existing Pavement Surfaces from Tack Coat and Oil. When work requires the placement of a tack coat pursuant to Subsection 302-5.4, the Contractor shall protect existing pavement surfaces outside of the work limits from the spreading of tack coat and oil adhering to truck tires exiting work area. The protected area shall extend the full width of the street and be by either of the following methods:

1) The Contractor shall wet the existing pavement surface to a distance of ten (10) feet away from the work limit. The wetted area shall be maintained as such until placement of asphalt concrete pavement is completed; OR

2) The Contractor shall provide a thin spreading of sand or rock dust material to a distance of five (5) feet away from the work limit. The sand or rock dust area shall be maintained as such until placement of asphalt concrete pavement is completed. The Contractor shall be responsible to remove the sand or rock dust immediately after the placement of asphalt concrete pavement is completed.

7-9.6 Curb Addresses. The Contractor shall be responsible to repaint addresses (4-inch high black numbers on white background) on curb faces when printed addresses have been removed due to curb construction.

7-10 PUBLIC CONVENIENCE AND SAFETY

7-10.1 Traffic and Access. Replace the fourth paragraph with the following:

Vehicular access to residential and commercial driveways shall be maintained to the property line except when necessary construction precludes such access. When the Contractor begins excavation of a residential driveway, safe access shall be provided within 4 hours and not later than the end of the same workday in which excavation began.

Add the following before the last paragraph:

The Contractor shall provide the necessary measures to prevent public access to private residences during removal and replacement of existing barrier structures, such as wood and chain link fences, during non-working hours.

The Contractor shall be responsible to provide at least 48 hours written notice to each affected property before closing or partially closing any driveway or pedestrian access.

Unless the Contractor makes other arrangements satisfactory to the owners, the Contractor shall provide and maintain safe, adequate vehicular access to places of business and public gathering as stated herein below:

(a) For each establishment (such as, but not limited to, gas stations, markets, and other "drive-in" business) on the corner of an intersection, which has a driveway (or driveways) on each intersecting street, the Contractor shall provide vehicular access to at least one driveway on each intersecting street insofar as the access is affected by the Contractor's operations.

(b) For each establishment (such as, but not limited to, motels, parking lots and garages) which has a one-way traffic pattern with the appropriate entrance driveway and exit driveway, the Contractor shall provide vehicular access to the entrance driveway and the exit driveway insofar as the access is affected by the Contractor's operations.

(c) The Contractor shall provide vehicular access to all schools and parking lots including, but not limited to, apartment building parking lots.

(d) The Contractor shall provide vehicular access to all establishments requiring such access for receiving or delivering materials or supplies.

(d) The Contractor shall make every reasonable effort to provide maximum access to churches on their Sabbath days. In addition, the Contractor shall not park or store equipment at the site of a church.

(e) At least three (3) days prior to starting work in any location, the Contractor shall distribute written notices to all businesses and residents that will be impacted by the work. The City will provide the notice template.

(f) The Contractor shall provide a minimum 1-inch thick temporary asphalt surface for an access ramp or sidewalk if it is not able to install the permanent improvement within 5 working days following the removal of the existing material at any location. The offset at any transverse or longitudinal joint shall not be more than one-half (1/2) inch. On the temporary asphalt surface: the running slope shall not exceed

1:20; the cross slope shall not exceed 1:50. The Contractor shall not be allowed any additional compensation for the installation and removal of temporary asphalt.

(g) The Contractor shall protect the work from traffic. Should the slurry seal be damaged, the Contractor shall provide satisfactory repairs at no cost to the City.

Should any change in these requirements be necessitated by extraordinary occurrences or requirements during the execution of the Work, the Contractor shall obtain prior written approval of the Engineer.

Add the following subsections:

7-10.1.1 Traffic Control Plan
The approved TCP included in the Contract shall be strictly adhered to, and the Contractor hereby understands and agrees that its failure to provide any facility or device as shown on the TCP, or its deviation from said Plan, unless otherwise approved by the Engineer shall constitute a breach of Contract.

The Contractor is hereby informed that for all lane closures required prior to the application of the surface course, the Contractor must provide reflectorized drums and not cones or delineators for all tapers, tangents and channelization.

On the day the Contractor installs the surface course, the Contractor shall remove the reflectorized drums and substitute with reflectorized delineators only. Reflectorized drums shall be prohibited as traffic control devices on the surface course.

The Contractor shall provide Traffic Control Plans for the Recycled Water Retrofits for Anza Avenue Medians and Parks. Traffic Control Plans shall to be submitted to the City of Torrance Manager for approval prior to start of retrofit work.

Full compensation for complying with the submittal requirements, furnishing, placing and removing traffic control shall be on a lump sum basis per the Contract Unit Price for TRAFFIC CONTROL.

7-10.1.2 Minimum Requirements for Maintaining Traffic Flow. The Contractor shall observe the following minimum requirements, unless otherwise shown on the plans:

a) Unless otherwise shown on the Traffic Control Plans, permitted by this Contract or authorized by the Engineer, all roadways, driveways, travel and turning lanes, sidewalks and access ramps shall remain open at all times.

b) The Contractor shall provide adequate steel plating to cover and protect a newly poured PCC cross gutter with spandrels and integral curb in order to allow traffic flow and not close a street. A minimum lane width of 14 feet shall be provided over the steel plating.

c) Any travel lane adjacent to the curb and within the work zone shall be, at a minimum, a twelve (12) foot-wide lane.

d) Reduction in lane requirements may be afforded only with prior written approval from the Engineer.

e) Traffic signs, flaggers, warning devices, safety traffic devices and, on select streets, electronic arrow boards for diverting and directing traffic shall be furnished, installed and maintained by the Contractor throughout the project.

f) The Contractor must provide access through the work zone in non-working hours by means of temporary ramps. Open trenches shall either be covered by steel plates, or ramped with crushed miscellaneous base. No drop-off at either transverse or longitudinal joints shall be allowed at any time. Temporary ramps, including those for driveway access, shall be constructed with either crushed miscellaneous base or temporary asphalt, as appropriate, with a minimum of 1" to 12" slope in both longitudinal and transverse directions.

All costs for the above requirements shall be included in the Contract Unit Price for TRAFFIC CONTROL.

7-10.1.3 Temporary Pavement Markings. If permanent pavement markings cannot be restored by the end of the work shift in which they were obliterated, temporary markings shall be provided by the Contractor prior to leaving the Work site on all streets except any street closed to through traffic. These temporary markings shall be as follows:

Temporary lanelines and/or centerlines shall consist of day/night reflectorized raised pavement markers, approved by the Engineer, spaced approximately twenty-four (24) feet apart. A list of approved day/night reflectorized raised pavement markers may be obtained from the CITY.

Where approved by the Engineer, the Contractor may use reflectorized lines approximately twenty-four (24) inches long and four (4) inches wide, spaced approximately twenty-four (24) feet apart.

Right edgelines shall not be simulated with dashes or pavement markers; however, portable delineators, guide markers, etc., may be used by the Contractor where it is considered desirable to enhance the edge of traveled way due to curvilinear alignment, narrowing pavement, etc., and shall be used when directed by the Engineer.

Locations where no-passing zone centerline delineation has been obliterated shall be posted by the Contractor with a sign package consisting of a **W20-1 "ROAD WORK AHEAD"** and **SC13 "DO NOT PASS"**.

All temporary pavement markings and signs shall be maintained, or replaced as necessary by the Contractor, until permanent pavement markings are restored.

All costs associated with the above requirements shall be included in the Contract Unit Price for TRAFFIC CONTROL.

7-10.1.4 Temporary Pavement Markers/Delineation. Temporary pavement delineation shall be furnished, placed, maintained and removed in accordance with the provisions of Section 12-3.01, of the Caltrans Standard Specifications. Nothing in these Special Provisions shall be construed as to reduce the minimum standards specified in the Manual of Traffic Controls published by Caltrans or as relieving the Contractor from responsibility as provided in 7-10 of these Special Provisions.

Whenever the work causes obliteration of pavement markers and/or delineation, the Contractor shall set in place temporary pavement markers/delineation prior to opening the traveled way to traffic. All pavement markers/delineation, including but not limited to lane lines, centerlines, directional arrows, pavement legends, etc, shall be provided at all times for traveled ways open to traffic.

All work necessary to establish temporary pavement markers/delineation shall be performed by the Contractor. Surfaces on which temporary pavement delineation is to be applied shall be

cleaned of all dirt and loose material and shall be dry when the pavement delineation is applied. Temporary pavement markers/delineation shall not be applied over existing pavement delineation or other temporary pavement delineation.

Temporary pavement markers/delineation shall be maintained until replaced with permanent pavement markers/delineation. Temporary pavement delineation shall be removed when 1) it conflicts with the permanent pavement delineation; 2) a new traffic pattern is established or 3) as determined by the Engineer.

Temporary pavement delineation shall consist of temporary reflective raised pavement markers placed on lane lines and centerlines at longitudinal intervals of not more than 24 feet apart. Temporary reflective raised markers shall be the same color as the lane line or centerline the markers replace. Temporary reflective raised pavement markers shall be, at the option of the Contractor, one of the following or approved equal:

Apex Universal Product No. 2SCSM-1W or 2SCSM-2Y markers manufactured by Apex Universal, 11033 Forest Place, Santa Fe Springs, CA 90607, Telephone (562) 944 8878.

Flex-O-Lite Raised Construction Marker (RCM), manufactured by Flex-O-Lite, Lukens Company, P.O. Box 4366, St. Louis, MO 63123-0166, Telephone (800) 325-9525.

Temporary reflective raised pavement markers shall be placed as directed by the Engineer. Temporary reflective raised pavement markers shall be applied to the pavement surface with the adhesive in accordance with the manufacturer's instructions. Epoxy adhesive shall not be used to apply temporary reflective raised pavement markers in areas where the pavement will not be removed.

Temporary lane line or centerline delineation consisting of temporary reflective raised pavement markers placed on longitudinal intervals of not more than twenty-four (24) feet, shall be used on lanes opened to public traffic for a maximum of fourteen (14) days. Prior to the end of the fourteen (14) days the planned permanent pavement delineation, except permanent pavement markers, shall be placed. If the planned permanent pavement delineation, exclusive of permanent pavement markers, is not placed within fourteen (14) days, the Contractor shall provide, at its expense, additional temporary pavement delineation as directed by the Engineer. The additional temporary pavement delineation to be provided shall be equivalent to the pattern specified for the permanent traffic lines as determined by the Engineer.

All costs for furnishing, placing, maintaining, and removing the temporary pavement markers/delineation shall be considered as included in the Contract Unit Price for TRAFFIC CONTROL.

7-10.1.5 Temporary "No Parking" Signs. The Contractor is responsible to post "Temporary No Parking" signs at least forty-eight (48) hours in advance of the first date of work and the required enforcement. If work is to begin on either a Monday or Tuesday, the Contractor shall post the signs on a Friday. Each sign must include text indicating the beginning and end dates and the hours in effect. "Tow-Away" and "No Parking" must be shown on each sign face. If it is required to temporarily restrict parking 24 hours/day then "Tow-Away" and "No Parking Anytime" must be shown on each sign face. The signs shall be mounted on either 1" x 2" X 3' high wood stakes, Type II barricades, or 39-inch high delineators. Signs shall be spaced at approximately 100' intervals on the effected side(s) of the street. Signs shall not be posted on trees, traffic signal poles, utility poles, street lights, or any other street furniture.

Signs shall be professionally made of moisture-resistant, heavy duty cardboard or other

approved material. All signs shall be maintained by the Contractor and kept free of graffiti. Any sign that becomes illegible or is removed shall be replaced within twenty-four (24) hours. The Contractor shall only be permitted to restrict parking for the minimum time necessary to complete on-going work. The Contractor shall be responsible to remove and repost "Temporary No Parking" signs when work will be delayed for more than five (5) consecutive days, or if the work must go beyond the end date shown on the signs, or otherwise directed by the Engineer.

The Contractor shall obtain approval for the signs and the placement thereof from the Engineer. Immediately after this approval and posting, the Contractor shall notify Torrance Police Department, Traffic Division, at (310) 618-5557 for review and enforcement. The parking restriction cannot be enforced until the signs have been in place 48 hours and the Police notified.

The Contractor shall maintain said signs through the day of work, and shall remove all of said signs on or within one (1) calendar day of the completion of work within the restricted parking area.

If, in the event a street scheduled for slurry or cape sealing was missed, the Contractor shall immediately remove all "No Parking" signs and notify all residents and others previously notified, with printed notices, that due to unforeseen circumstances, the Contractor was not able to seal the street as previously notified, that the street will be rescheduled in approximately 1 to 2 weeks, and that they will be re-notified. The Contractor shall, on the job site prior to the start of each day's work, have an adequate supply of approved letters of notification to residents for missed streets.

Full compensation for furnishing, placing, maintaining and removing temporary signs shall be considered as included in the Contract Unit Price for TRAFFIC CONTROL.

7-10.1.6 Holiday Moratorium. No reduction in lane widths on any major street shall be permitted during the CITY's holiday period construction moratorium, which begins on the Monday prior to Thanksgiving and ends on the Friday following New Year's Day. No traffic signal shall be out of operation for any period of time during said moratorium.

7-10.1.7 Trash Pick-Up. Trash pick up days are established and will not be changed. Consult the private waste haulers regarding trash pick up schedule. The Contractor shall ensure streets and alleys affected by the work are accessible to the CITY's automated trash trucks on designated pick up days. In alleys, Contractor shall be responsible to provide and maintain access to large trash containers during the course of the work.

7-10.1.8 Protection of Permanent Pavement Markings, Manholes, Valves. The Contractor shall, in areas outside of the work zone, protect existing raised pavement markers, thermoplastic legends and markings. The Contractor shall cover and protect existing valve and manhole covers, utility caps, and similar items from damage and discoloration from the slurry and cape seal applications. Prior to the application of the slurry seal or cape seal the Contractor shall remove by method of wet sandblasting any existing thermoplastic or painted pavement legend or marking within the limits of work.

The contractor shall be responsible for replacing or restoring any damaged items to the satisfaction of the Engineer.

Full compensation for the items in this subsection shall be considered as included in the Contract Unit Price for TRAFFIC CONTROL.

7-10.3 Street Closures, Detours, Barricades.

Add the following paragraph after the first paragraph:

In addition to the requirements of this subsection, the Contractor shall conform to the requirements for street closures, detours, and barricades as stipulated in the Special Provisions.

However, deviations from the requirements stipulated in the Special Provisions may be permitted upon written approval of the Public Works Director when such deviations are in the best interest of the City.

Replace the second paragraph with the following:

The Contractor shall notify the Public Works Department at (310) 781-6900, at least ten (10) working days in advance of closing or partially closing any street or alley and comply with their requirements. In addition, the Contractor shall notify the Torrance Police Department at (310) 328-3456 and Torrance Fire Department at (310) 781-7040 at least two (2) working days in advance of such closing.

It shall be the Contractor's responsibility to allow passage of the Torrance Transit System coaches through the construction area at all times. The Contractor shall notify the Torrance Transit Department at (310) 618-6266 at least 48 hours prior to construction affecting bus stop zones to allow said Transit System to temporarily abandon and relocate bus stop zones within the construction area.

The Contractor shall immediately notify the above parties upon completion of the construction work and opening or reopening of any street or alley.

Add the following:

The Contractor shall install, maintain, and remove all temporary delineators, barricades, lights, warning signs and other devices necessary to control traffic as specified in the project plans and these specifications. Materials for a temporary facility may be provided from new or used materials. If used materials are provided, they shall be sound, in good condition and otherwise meet the requirements of new materials. All traffic control devices shall be free of graffiti, and the Contractor shall be responsible to immediately clean and/or replace any device to the satisfaction of the Engineer.

Full compensation for furnishing, installing, maintaining and removing the above traffic control devices shall be considered as included in the Contract Unit Price for TRAFFIC CONTROL.

Where streets in which improvements are being constructed are specified hereinafter to be closed to through traffic, it shall be understood that such closures shall apply only to the portions of such streets where construction is actually in progress.

After award of the contract, the Contractor shall submit to the City its proposed Traffic Control Plan as required by the Special Provisions and to comply with the requirements specified herein. This submittal shall be made sufficiently in advance (street closure schedules MUST be submitted ten (10) days prior to closing the affected street) of any rerouting or diversion of traffic by the Contractor to allow for a review of the Contractor's proposed traffic control by the Public Works Director.

Substitute the following for the first sentence of the third paragraph:

The Contractor shall submit to the Public Works Director detailed plans prepared by a Registered Civil Engineer of all temporary bridges proposed for use on this project. This includes bridges which may have been used on previous projects. The Contractor shall allow 15 days for approval by the Engineer. The drawings shall indicate specific locations where the bridge is to be used. Bridges shall not be installed until such time as written approval is obtained from, and the bridge is inspected by, the Public Works Director.

Revise the final sentence of the third paragraph to include:

Except as modified hereinafter or within the Special Provisions.

Add the following paragraph after the third paragraph:

The Contractor shall conform to Section 74.6.8 of the Torrance Municipal Code. In addition, the Contractor shall comply with directions from the Engineer to provide protection at excavations, trenches and/or other potentially hazardous construction areas. The Contractor shall be required to erect temporary railing (Type K) per Caltrans Standard Plan T3, five-foot high chain link fences, or equivalent protection, to completely enclose all open excavations over three feet (3') in depth. Fencing shall be approved by the Engineer, and provide adequate security. Fencing may be removed during working hours to the extent necessary to provide access and working room, in which case the Contractor shall provide equivalent security, to the satisfaction of the Engineer, during said periods. Any excavation not secured to the satisfaction of the Engineer shall be completely backfilled prior to the end of each day's construction activities. The Engineer may require additional security devices, lighting or other protection in addition to said fencing. Full compensation for furnishing, placing and removing temporary protection shall be considered as included in the Contract Unit Price for TRAFFIC CONTROL.

7-10.3.1 Temporary Steel Plates. When backfilling operations of an excavation in the traveled way, whether transverse or longitudinal cannot be properly complete within a work day, steel plate bridging with a non-skid surface and shoring may be required to preserve unobstructed traffic flow. In such cases, the following conditions shall apply:

1. Steel plate used for bridging shall extend a minimum of 12-inches beyond the edges of the trench.

2. Steel plate bridging shall be installed to operate with minimum noise.

3. The trench shall be adequately shored to support the bridging and traffic loads

4. Temporary paving with cold asphalt concrete shall be used to feather the edges of the plates, if plate installation by Method (2) described below, is used.

5. Bridging shall be secured against displacement by using adjustable cleats, shims, or other devices.

Steel plate bridging and shoring shall be installed using either the following Method (1) or Method (2):

Method (1) (For speeds more that 45 mph – Van Ness Avenue, Sepulveda Boulevard, Crenshaw Boulevard and 182nd Street)

The Pavement shall be cold planed to a depth equal to the thickness of the plate and width and length equal to the dimensions of the plate.

Method (2) (For speeds 45 mph or less)

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

The Contractor shall be responsible for maintenance of the steel plates, shoring and asphalt concrete ramps.

The following table shows the advisory minimal thickness of steel plate bridging required for a given trench width (A-36 grade steel, designed for HS20-44 truck loading).

Trench Width	Minimum Plate Thickness
10"	½"
1'-11"	¾"
2'-7"	7/8"
3'-5"	1"
5'-3"	1 ¼"

For spans greater than 5'-3" a structural design shall be prepared by a California registered civil engineer.

All steel plates within the right-of-way whether used in or out of the travel way shall be without deformation. Steel plates shall be non-skid. Advanced signs shall be required for steel plates within traveled ways (Type P per the Watch Manual or a Rough Road sing (W33) per Caltrans requirements).

Add the following:

7-10.4.5 Asbestos Cement Water Pipe

All work with asbestos cement pipe shall conform with American Water Works Association Publication No. M16 "Work Practices for Asbestos Cement Pipe".

The Cal/OSHA enforcement unit enforces California's Asbestos Standards in Construction (8 CCR Section 1529. Construction projects are subject to the California Code of Regulations, Title 8, Section 1529. The contractor should be thoroughly familiar with the requirements associated with the above regulations.

On all construction sites with asbestos operations, the contractor must designate a *competent person*—one who can identify asbestos hazards in the workplace and has the authority to correct them. This person must be qualified and authorized to ensure worker safety and health as required by *Subpart C, General Safety and Health Provisions for Construction* (29 CFR Part 1926.20). Under these requirements for safety and health prevention programs, the *competent person* must frequently inspect job sites, materials, and equipment.

As supervisor of the entire project, the general contractor shall ascertain whether the asbestos contractor is in compliance with this standard, and shall require such contractor to come into compliance with this standard when necessary.

The *competent person* must attend a comprehensive training course for contractors and supervisors certified by the U.S. Environmental Protection Agency (EPA) or a state approved training provider, or a complete a course that is equivalent in length and content.

The contractor responsible for the cutting and removal of the asbestos cement pipe shall hold a current asbestos abatement license with the state. All employees of the licensed asbestos abatement contractor performing work covered under the project scope of work shall be trained in a training program that meets the requirements of subsection (k)(9)(H).

7-10.4.5.1 Training for Contractor Personnel

(A) The contractor shall, at no cost to the employee, institute a training program for all employees who are likely to be exposed in excess of a PEL and for all employees who perform Class I through IV asbestos operations, and shall ensure their participation in the program.

(B) Training shall be provided prior to or at the time of initial assignment and at least annually thereafter. Employees engaged in asbestos-related work that requires employer registration under Section 341.6 or engaged in asbestos cement pipe operations as defined in subsection (r), shall be trained and certified by a Division approved training provider. To be approved by the Division, training providers shall (1) apply to the Division for course approval and (2) pay fees covering the cost of the approval process to the Division as specified in regulations promulgated by the Division pursuant to the provisions of Chapter 3.5 (beginning with Section 11340) of Part 1 of Division 3 of Title 2 of the Government Code.

7-10.4.5.2 Training for the Competent Person

(A) For Class I, and II asbestos work the competent person shall be trained in all aspects of asbestos removal and handling, including: abatement, installation, removal and handling; the contents of this standard; the identification of asbestos; removal procedures, where appropriate; and other practices for reducing the hazard. Such training shall be obtained in a comprehensive course for supervisors, that meets the criteria of EPA's Model Accredited Plan (40 CFR Part 763, Subpart E. Appendix C), such as a course conducted by an EPA-approved or state approved training provider, certified by EPA or a state, or a course equivalent in stringency, content and length.

(B) For Class III and IV asbestos work, the competent person shall be trained in aspects of asbestos handling appropriate for the nature of the work, to include procedures for setting up glove bags and mini-enclosures, practices for reducing asbestos exposures, use of wet methods, the contents of this standard, and the identification of asbestos. Such training shall include successful completion of a course that is consistent with EPA requirements for training of local education agency maintenance and custodial staff as set forth at 40 CFR 763.92(a)(2), or its equivalent in stringency, content, and length. Competent persons for Class III and IV work, may also be trained pursuant to the requirements of subsection (o)(4)(A) of this section.

7-10.4.5.3 Regulated Areas

(1) All Class I, II and III asbestos work shall be conducted within regulated areas. All other operations covered by this standard shall be conducted within a regulated area where airborne concentrations of asbestos exceed, or there is a reasonable possibility they may exceed a PEL. Regulated areas shall comply with the requirements of subsections (2), (3), (4), and (5) of this subsection.

(2) Demarcation. The regulated area shall be demarcated in any manner that minimizes the number of persons within the area and protects persons outside the area from exposure to airborne asbestos. Where critical barriers or negative pressure enclosures are used, they may demarcate the regulated area. Signs shall be provided and displayed pursuant to the requirements of subsection (k)(7) of this section.

(3) Access. Access to regulated areas shall be limited to authorized persons and to persons authorized by the Chief or Director.

(4) Respirators. All persons entering a regulated area where employees are required pursuant to subsection (h)(1) of this section to wear respirators shall be supplied with a respirator selected in accordance with subsection (h)(2) of this section.

(5) Prohibited activities. The contractor shall ensure that employees do not eat, drink, smoke, chew tobacco or gum, or apply cosmetics in the regulated area.

(6) Competent Persons. The contractor shall ensure that all asbestos work performed within regulated areas is supervised by a competent person, as defined in subsection (b) of this section. The duties of the competent person are set out in subsection (o) of this section.

7-10.4.5.4 Exposure Assessments and Monitoring

(1) General monitoring criteria.

(A) The contractor is required under the current regulations to perform monitoring to determine accurately the airborne concentrations of asbestos to which employees may be exposed.

(B) Determinations of employee exposure shall be made from breathing zone air samples that are representative of the 8-hour TWA and 30-minute short-term exposures of each employee.

(C) Representative 8-hour TWA employee exposure shall be determined on the basis of one or more samples representing full-shift exposure for employees in each work area. Representative 30-minute short-term employee exposures shall be determined on the basis of one or more samples representing 30 minute exposures associated with operations that are most likely to produce exposures above the excursion limit for employees in each work area

7-10.4.5.5 Protective Clothing

The contractor shall provide or require the use of protective clothing, such as coveralls or similar whole-body clothing, head coverings, gloves, and foot coverings for any employee exposed to airborne concentrations of asbestos that exceed the TWA and/or excursion limit prescribed in subsection (c) of this section, or for which a required negative exposure assessment is not produced, and for any employee performing Class I operations which involve the removal of over 25 linear or 10 square feet of TSI or surfacing ACM and PACM. The employer shall prohibit the removal of asbestos from protective clothing and equipment by blowing, shaking, or brushing.

7-10.4.5.6 Disposal of Asbestos Cement Pipe Waste Material

The contractor shall be responsible for the following:

1. The handling (including cutting, placing in sealed wrapping and disposal) of the contaminated material in accordance with the current laws and regulations.
2. The preparation and submittal of the documentation required as part of the reporting and recording of the method used to handle the contaminated material from the "cradle to grave". The documentation shall be in compliance with all current regulations.
3. Providing notification to the regulatory authorities in accordance with all state and federal requirements.
4. The transportation and disposal of the contaminated material in an authorized dump site in accordance with all current relevant laws and regulations.
5. All labor, equipment, materials, plant and incidentals required to complete the above scope of work shall be deemed included in the bid items and no additional cost shall be allowed.

Add the following subsection:

7-15 PROJECT CONSTRUCTION SIGNS AND PORTABLE CHANGEABLE MESSAGE SIGNS.

The Contractor shall furnish and install two (2) Project Construction Signs at locations to be determined by the Engineer. The signs shall be in accordance with City Standard Plan No. T503.

Full compensation for furnishing, installing, maintaining and removing signs shall be per unit per the Contract Unit Price for PROJECT CONSTRUCTION SIGNS.

The Contractor shall furnish and install four (4) Portable Changeable Message signs (PCMS) on the construction site for use and relocation during construction. The City will allow only the following PCMS manufactures and models:

1. Manufactured by **Solar Tech** and be model MB2
2. Manufactured by **ADDCO** and be model DH500-ALS
3. Manufactured by **WANCO** and be model WVT3 Mini Three-Line Message

Contact BC Rentals at (714) 575-5020 or via http://bctraffic.com/message-boards.htm for rental or purchase information.

The Contractor shall install a locking device on each PCMS to prohibit access to the computer keyboard. The Contractor shall provide to the Engineer the key or combination to each locking device and the computer password to each PCMS **OR** possess any equipment, on any working day, to enter or modify a message for each PCMS as directed by the Engineer. Contractor shall relocate each PCMS as directed by Engineer at no additional cost to the City.

Full compensation for furnishing, installing, maintaining, entering/modifying message screens, relocation on the job site and removal shall be per unit per the Contract Unit Price for PORTABLE CHANGEABLE MESSAGE SIGNS. If the Contractor does not possess the equipment or tools, or fails on any working day, to enter or modify a message for a PCMS, the Engineer may deduct $50 per day, per each PCMS, from a Progress Payment until said message is entered or modified.
ASK FOR KEYS TO ACCESS AND PASSWORD TO KEYBOARD

SECTION 9 - MEASUREMENT AND PAYMENT

9-1 MEASUREMENT AND PAYMENT. Add the following sections:

9-1.2.1 Payment for Labor and Materials.

The Contractor shall pay and cause the subcontractors to pay any and all accounts for labor, including Worker's Compensation premiums, State Unemployment and Federal Social Security payments and all other wage and salary deductions required by law. The Contractor also shall pay and cause the subcontractors to pay any and all accounts for services, equipment and materials used by it and the subcontractors during the performance of work under this contract. All such accounts shall be paid as they become due and payable. If requested by the Engineer, the Contractor shall immediately furnish the City with proof of payment of such accounts.

9-1.2.2 Measurement and Payment

Payment of each item will include full compensation for furnishing all labor, materials, tools, equipment and backup equipment; transportation and technical competence for performing all work necessary to complete each item as indicated on the plans and as specified in these Contract Documents, including but not limited to obtaining all applicable certifications necessary for specialty personnel and major equipment in conformance with Subsection 7-5, and all other applicable permits; securing a storage yard to store all equipment and materials to be used on the job, disposal of waste materials, restoration of the site, etc. The storage yard may also be used as a temporary storage for excavated materials, and traffic control items. No separate payment will be made for mobilization and demobilization. Costs for mobilization/demobilization shall be included in the Contract unit price for MOBILIZATION/DEMOBILIZATION.

9-2 LUMP SUM WORK. Replace the second paragraph with the following:

The Contractor shall, within five (5) working days of receipt of a request from the Engineer, submit a complete breakdown of lump sum bid prices showing the value assigned to each part of the work, including an allowance for profit and overhead. In submitting the breakdown, the Contractor certifies that it is not unbalanced and that the value assigned to each part of the work represents its estimate of the actual cost, including profit and overhead, of performing that part of the work. The breakdown shall be sufficiently detailed to permit its use by the Engineer as one of the bases for evaluating requests for payment. No extra costs shall be allowed for providing these breakdowns.

9-3 PAYMENT.

9-3.2 Partial and Final Payment. Replace the third paragraph with the following:

For each progress estimate, 5 percent will be deducted and retained by the CITY, and the remainder less the amount of all previous payments will be paid. In addition, 125% of the amount of outstanding "Stop Notices" shall be withheld.

Add the following:

The Contractor shall submit all requests for payment on a Progress Payment Invoice.

Prior to submittal of said invoice, all items for which payment is requested shall be checked and approved in writing by the Engineer. No payments will be made unless all back-up data, including the updated schedule, is submitted with the payment request and the Progress Payment Invoice is signed by both Contractor and Engineer.

9-3.4 Mobilization. Replace the entire subsection with the following:

Mobilization shall include the provisions of the Construction Schedule, Best Management Practices and Storm Water Pollution Prevention Plan; Sewage Spillage Prevention; Emergency Response Plan; site review; obtaining all permits, insurance, and bonds; moving onto the site all plant and equipment; furnishing and erecting plants, temporary buildings, and other construction facilities, and removal of same at completion of the Work; and other work, all as required for the proper performance and completion of the Work.

Mobilization shall include, but not be limited to, the following items:

(a) Submittal and modification, as required, of the Construction Schedule and Storm Water Pollution Prevention Plan.

(b) Moving on to the site of all Contractor's plant and equipment required for the first month's operations.

(c) Installing temporary construction power and wiring.

(d) Establishing fire protection system.

(e) Developing construction water supply.

(f) Providing on-site sanitary facilities and portable water facilities, as required.

(g) Arranging for and erection of Contractor's work and storage yard.

(h) Submittal of all required insurance certificates and bonds, including subcontractors.

(i) Obtaining all required permits.

(j) Posting all OSHA required notices and establishment of safety programs.

(k) Potholing and other research and review as necessary to verify site conditions and utility locations

(l) Having the Contractor's Superintendent present at the job site full-time.

(m) Removal (including all spray-painted markings on any surface), cleanup, and restoration

Add the following section:

9-3.5 Noncompliance with Plans and Specifications.

Failure of the Contractor to comply with any requirement of the Plans and Specifications, and/or to immediately remedy any such noncompliance upon notice from the Engineer, may result in suspension of Contract Progress Payments. Any Progress Payments so suspended shall remain in suspension until the Contractor's operations and/or submittals are brought into compliance to the satisfaction of the Engineer. No additional compensation shall be allowed as a result of suspension of Progress Payments due to noncompliance with the plans or specifications. The Contractor shall not be permitted to stop work due to said suspension of Progress Payments.

9-4 CLAIMS.

The Contractor shall not be entitled to the payment of any additional compensation for any cause, including any act, or failure to act, by the CITY, or the happening of any event, thing or occurrence, unless the Contractor shall have given the CITY due written notice of potential claim as hereinafter specified.

The written notice of potential claim shall set forth the reasons for which the Contractor believes additional compensation will or may be due, the nature of the costs involved, and, insofar as possible, the amount of the potential claim. Said notice shall be submitted on a form approved by the CITY at least forty-eight (48) hours (two working days) in advance of performing said work, unless the work is of an emergency nature, in which case the Contractor shall notify and obtain approval from the Engineer prior to commencing the work. The Engineer may require the Contractor to delay construction involving the claim, but no other work shall be delayed, and the Contractor shall not be allowed additional costs for any said delay but may be allowed an extension of time if the Engineer agrees that the work delayed is a controlling element of the Construction Schedule. The Contractor shall be required to submit any supporting data (or a detailed written explanation justifying further delay) within five (5) work days of a request from the Engineer and shall be responsible for all costs associated with any delays resulting from late and/or incomplete submittals. By submitting a Bid, the Contractor hereby agrees that this subsection shall supersede 6-6.3 and 6-6.4 of the Standard Specifications.

It is the intention of this subsection that differences between the parties arising under and by

virtue of the Contract be brought to the attention of the Engineer at the earliest possible time in order that such matters may be settled, if possible, or other appropriate action promptly taken. The Contractor hereby agrees that it shall have no right to additional compensation for any claim that may be based on any such act, failure to act, event, thing or occurrence for which no written notice of potential claim as herein required was timely filed.

PART 2 - CONSTRUCTION MATERIALS

SECTION 200 – ROCK MATERIALS

200-2 UNTREATED BASE MATERIALS

200-2.1 General. Replace the entire subsection with the following:

Untreated base for pavement, curb, gutter, cross gutters, bus pads, hardscape and other improvements shall be either Crushed Aggregate Base conforming to 200-2.2 or Crushed Miscellaneous Base conforming to 200-2.4.

SECTION 203 – BITUMINOUS MATERIALS

OPTION A

203-5 EMULSION-AGGREGATE SLURRY

203-5.1 General. Replace the first sentence with the following:

Emulsion-aggregate slurry shall be a stable mixture of emulsified asphalt, mineral aggregate, water and retardant and is herein referred to as slurry.

203-5.2 Materials. Replace the entire subsection with the following:

1) Emulsified asphalt shall be cationic quick-set type, CQS-1h conforming to the following requirements:

TABLE 203-5.2(A)
CQS-1h QUICK SET EMULSION[1]

Tests	ASTM Test Method	Requirements Min.	Max.
Furol Viscosity @ 77°F, sec.	D244	15	100
Residue from distillation, % by weight	D244	60 Min.	
Sieve Test, % retained on No. 20	D244	.10 Max.	
Particle Charge Test (Cationic)	D244	Positive	
Storage Stability; One-Day Settlement	D244	1% Max.	
Residue			
Penetration 0.1 mm	D5	45	80
Solubility in TCE, %	D2042	97.5 Min.	
Ductility, 77F, cm	D113	40 Min.	

[1]Table does not apply to latex or polymer modified emulsion.

2) The Retarder for quick-setting emulsion and the asphalt modifier shall be a type approved by the Engineer. The amount of retarder and asphalt modifier to be included in the quick-set slurry shall be that amount necessary to ensure that the applied slurry can support vehicular traffic within 60 minutes after the last application.

3) Water shall be potable and compatible with the other ingredients of the slurry.

4) Aggregate shall be rock dust or other mineral/aggregate approved by the Engineer and shall conform to the requirements of Section 200. The aggregate without additive shall conform to the following requirements:

TABLE 203-5.2(B)

TESTS	ASTM METHOD	REQUIREMENTS
Percentage Wear 500 Revolutions[1]	C131	35% Maximum
Sand Equivalent	D2419	55 Minimum
Soundness (5 Cycles)	C 88	15% Maximum

[1]ASTM C131 to be run on plus four graded material before final crushing.

OPTION B

203-5 EMULSION-AGGREGATE SLURRY

203-5.1 General. Replace the first sentence with the following:

Emulsion-aggregate slurry shall be a stable mixture of emulsified asphalt, mineral aggregate, water and retardant and is herein referred to as slurry.

203-5.2 Materials. Replace the entire subsection with the following:

The ingredients of the slurry shall conform to the following:

1) Emulsified asphalt shall be Polymer Modified cationic quick-set type, CQS-1h containing 2.5% minimum Ultrapave 65K styrene/butadiene/rubber latex as manufactured by Textile Rubber and Chemical Company or approved equal. CQS-1h shall conform to the requirement of 203-1.3 and the following specifications when tested according to appropriate ASTM methods:

TABLE 203-5.2(A)
CQS-1h QUICK SET EMULSION

Tests	ASTM Test Method	Requirements Min.	Max.
Furol Viscosity @ 77°F, sec.	D244	15	100
Residue from distillation, % by weight	D244	60 Min.	
Sieve Test, % retained on No. 20	D244	.10 Max.	
Particle Charge Test (Cationic)		Positive	
Storage Stability; One-Day Settlement	D244	1% Max.	
Residue			
Penetration 0.1 mm	D5	45	80
Solubility in TCE, %	D2042	97.5 Min.	
Ductility, 77°F, cm	D113	40 Min.	
Test for Polymer Content			
Torsional Recovery, %	Caltrans 322	18.0 Min.	
Polymer Solids Content, % by weight of Asphalt Solids	Caltrans 401	2.5	3.0

2) The Retarder for quick-setting emulsion and the asphalt modifier shall be a type approved by the Engineer. The amount of retarder and asphalt modifier to be included in the quick-set slurry shall be that amount necessary to ensure that the applied slurry can support vehicular traffic within 60 minutes after the last application.

3) Water shall be potable and compatible with the other ingredients of the slurry.

4) Aggregate shall be rock dust produced by the crushing of rock and gravel. The aggregate without any additive shall conform to the following requirements:

TABLE 203-5.2(B)

TESTS	ASTM METHOD	REQUIREMENTS
Percentage Wear 500 Revolutions[1]	C131	35% Maximum
Sand Equivalent	D2419	55 Minimum
Soundness (5 Cycles)	C 88	15% Maximum

[1]ASTM C131 to be run on plus four graded material before final crushing.

a) The Contractor shall provide an aggregate stock pile 24-hours prior to starting the work. Location to be approved by the Engineer if within City right-of-way.

b) Contractor shall schedule and coordinate the delivery of aggregate to the stockpile(s) such that: (1) deliveries originate at the plant and arrive at the stockpile site within normal work hours on the same calendar day; (2) delivery site and project name are explicitly stated on each delivery ticket; (3) successive deliveries on the same calendar day show the cumulative total for that day; (4) copies of all delivery tickets shall be delivered to the Engineer before the end of the working day. Any

delivery tickets not so delivered may be rejected by the CITY. Any deviation from this process must have the prior approval of the Engineer.

c) The Contractor shall furnish calibrated vehicle weigh scales at the stockpile site for use by the CITY. The portable scales will be utilized for inspection and all mixers shall be weighed prior to transit. All equipment and tools necessary for field measurement of the emulsion and aggregate by the CITY shall be furnished and maintained by the Contractor.

The Contractor shall be responsible for the initial setup of the weigh scales at the stock-pile site and all necessary relocations during the slurry seal operations.

The cost to furnish the vehicle scales, all equipment, and tools necessary for field testing shall be included in the Contract Unit Price for the EMULSION AGGREGATE SLURRY and no additional compensation shall be allowed.

203-6 ASPHALT CONCRETE

203-6.1 General. Add the following:

Asphalt concrete shall be Type Class B-PG-64-10 for the base courses and C2-PG-64-10 for surface courses. For leveling courses of 1-inch thick or greater, asphalt concrete shall be Type Class C2-PG-64-10. For leveling courses between 0.75 inches to 0.99 inches thick, asphalt concrete shall be Type Class D2-PG-64-10.

SECTION 207 – PIPE

207-9 IRON PIPE AND FITTINGS.

207-9.2 Ductile Iron Pipe for Water and other Liquids.

207-9.2.1 General. Replace the last paragraph with the following:

Ductile iron pipe (DIP) shall comply with AWWA C150 and C151. Unless otherwise specified on the Plans or Specifications, the minimum pipe wall thickness shall be equal to Pressure Class 350.

207-9.2.2 Pipe Joints. Replace the entire subsection with the following:

Unless otherwise specified on the Plans or Specifications, all pipe joints shall be ductile iron and shall comply with the requirements of Table 207-9.2.2 (A) of these Special Provisions. Pipe joints shall be rated for a working pressure of 350 psi.

TABLE 207-9.2.2 (A)

Type of Joint	Specifications
Rubber Gasket Push-on Joint	AWWA C111
Mechanical Joint	AWWA C111
Flanged Joint	AWWA C153 or C110
Flanged Joint (Threaded Flanges)	AWWA C115

Gaskets shall be 1/8-inch thick and made of styrene butadiene rubber (SBR). Gaskets shall conform to AWWA C111 and 208-1.2. Flange gaskets shall be full-face, with bolt holes pre-

punched and rated for 350 psi working pressure.

Flange assembly bolts shall be square head machine bolts conforming to ANSI/ASME B18.2.1 with heavy hexagon nuts conforming to ANSI/ASME B18.2.2. Bolts and nuts shall be threaded according to ANSI/ASME B1.1, course thread series, Class 2 fit. Bolt length shall be such that after joints are made up, the bolts shall protrude through the nut by no more than ½-inch. Bolts for use in buried installations shall be stainless steel Type 316. Bolts for use in submerged installations shall be stainless steel Type 304.

207-9.2.2.1 Restrained Joints. Add the following subsection:

Restrained joints for piping 6 inches and larger shall be American Cast Iron Pipe Company "MJ Coupled Joint," or "Flex-Ring," U.S. Pipe "TR-Flex," or equal. All weldments for restrained joints shall be tested by the liquid penetrant method per ASTM E 165.

207-9.2.3 Fittings. Replace the entire subsection with the following:

Unless otherwise specified on the Plans and Specifications, all fittings shall be ductile iron and manufactured in accordance with AWWA C153 or C110. Fittings shall be furnished with restrained joints AND thrust blocked and anchored in accordance with City of Torrance Standard Plan No. T713. Fittings shall have a minimum pressure rating of 250 psi working pressure.

Smith-Blair sleeve-type couplings shall be MJ x MJ, 12-inches minimum length and rated 250 psi working pressure. Romac type sleeves may be used where approved by the Engineer.

Special fittings are not allowed without the prior written approval from the Engineer.

Rubber gaskets, bolts and nuts shall conform to 207-9.2.2 of these Special Provisions.

207-9.2.4 Lining and Coating. Add the following:

Cement for mortar lining shall be Type II or V. Fly ash or pozzolan shall not be used as a cement replacement.

Fittings lined and/or coated in the field will not be accepted as conforming to AWWA C104, C151, or C153.

The exterior surfaces of ductile iron pipe, fittings, valves and appurtenances that will be exposed to the atmosphere inside structure or above ground shall be thoroughly cleaned and painted with a rust-inhibitive primer conforming to the requirements of 210-1.8 of these Special Provisions.

207-9.2.6 Polyethylene Encasement for External Corrosion Protection. Replace the entire subsection with the following:

All ductile iron pipes, fittings, valves and appurtenances shall be wrapped with 8 mil. polyethylene film. The polyethylene film shall be pulled snugly around the pipes, fittings, valves and appurtenances and held in place with a 2-inch wide polyethylene adhesive tape in accordance with AWWA C105 Method A.

207-9.2.7 Service Saddles. All service connections to DIP water mains shall be constructed with bronze service saddles, double-strap type. Service saddles shall be Mueller BR2B, James Jones J-979, or approved equal.

SECTION 209 – ELECTRICAL COMPONENTS

209-2 MATERIALS.

209-2.1 Electroliers. Replace the entire subsection with the following:

Electroliers shall be as shown on the Plans and shall conform to the specifications and requirements of the Edison Company.

SECTION 210 – PAINT AND PROTECTIVE COATINGS

210-1 PAINT

210-1.6 Paint for Traffic Striping, Pavement Marking, and Curb Marking

210-1.6.1. General. Add the following:

All permanent striping and pavement markings shall be hot applied alkyd thermoplastic in accordance with the provisions of Section 84-2.02 of the Caltrans Standard Specifications.

210-1.6.2. Thermoplastic Paint, State Specifications. Replace the entire subsection with the following:

Thermoplastic traffic stripes and pavement markings shall conform to the provisions of Section 84 of the Caltrans Standard Specifications. Contractor shall paint a solid black stripe between all double thermoplastic striping.

Add the following subsections:

210-1.8. Paint for Exterior Surfaces of Ductile Iron Pipe. The exterior surfaces of ductile iron pipe, fittings, valves and appurtenances that will be exposed to the atmosphere inside structure or above ground shall be painted with three coats of "Rustoleum No. 7773" or approved equal. The final coat color shall be selected by Engineer or identified on plans. Total thickness of coating shall be 6 mils.

210-1.9 Coating for Valves. Except as otherwise provided, all ferrous surfaces (excluding non-corrosive surfaces) in water passages of all valves 4-inches and larger shall be fuse coated with an epoxy coating in accordance with the "Standard for Protective Epoxy Interior Coatings for Valves and Hydrants" (AWWA C550).

210-1.12 Concrete Vaults and Manholes. The interior and exterior of concrete vaults and manholes shall be coated with crystalline waterproofing. Crystalline waterproofing shall be cementitious coating containing components that will diffuse into the concrete by water, react with lime, and create an impervious, waterproof, calcified barrier in the substrate. Technical requirements are as follows:

1) Permeability at 2.6×10^{-8} cm/sec (2 coats) minimum per Army (COE CRD-C 48-55 or CRD-6 48-73.

2) Compatibility; shall produce no degradation of substrate.

SECTION 214 – PAVEMENT MARKERS

Delete the entire Section 214 and replace with Section 85 of the Caltrans Standard Specifications (latest edition).

85-1.05 Reflective Pavement Markers

85-1.055 Adhesives. Add the following:

At the option of the Contractor, a hot melt bituminous adhesive may be used to cement the markers to the pavement, instead of the Rapid Set Type or Standard Set Type adhesive specified in Section 85-1.06 of the Caltrans Standard Specifications. The bituminous adhesive material, if used, shall conform to the following:

ASTM Test Specification	Method	Requirement
Flash Point, COC °F	D 92	550 Min.
Softening Point, °F	D 36	200 Min.
Brookfield Viscosity, 400° F	D 2196	3,000-7,500 cP
Penetration, 100g 5 sec., 77° F	D 5	10-20 dmm
Filler Content, % by weight (Insoluble in 1,1,1 Trichloroethane)	D 2371	50-75

Add the following section:

SECTION 215 – MISCELLANEOUS POTABLE WATER DISTRIBUTION SYSTEM MATERIALS

215-1 VALVES.

215-1.1 General. All valves and gates shall be new and of recent manufacture. The flanges shall be plain faced and shall conform in dimensions and drilling to ANSI B16.1 Class 125 or ANSI/AWWA C153. Each valve body shall be tested to a pressure equal to twice its design water working pressure, except that gate valves shall be tested in accordance with the requirements of AWWA C500.

All interior parts of valves manufactured of bronze or brass except valve stems, shall conform to the requirements of ASTM B62. Gate valve stems shall be of bronze, containing not more than 5 percent of zinc, not more than 2 percent of aluminum, and having a minimum tensile strength of 60,000 psi, a yield strength of 40,000 psi, and elongation of at least 10 percent in two inches, as determined from a test coupon poured from the same ladle from which the valve stems to be furnished are poured.

Except as otherwise provided, all ferrous surfaces (excluding non-corrosive surfaces) in the water passages of all valves, 4 inch and larger, shall be fuse coated with an epoxy coating in

accordance with AWWA C550. All buried valves shall be provided with an exterior protective coating.

Unless otherwise shown on the Plans, all in-line valves shall be furnished with mechanical ends.

215-1.2 Resilient-Seated Gate Valves. Gate valves, size 3 inches through 12 inches, shall be resilient seat, solid wedge, non-rising stem type equipped with "O" ring seals and conforming to AWWA C509. Gate valves shall be rated for 250 psi working pressure.

Valves shall have a 2-inch square operating nut or hand wheel, as shown on the Plans, and shall open with a counter-clockwise rotation of the operator.

Gate valves shall be Mueller A-2360 to match pipe size with flanged or mechanical ends.

215-1.4 Tapping Sleeves and Valves. Tapping sleeves shall be of ductile iron pipe or stainless steel specifically designed to withstand the strains and vibrations of the tapping machine. The tapping sleeve shall have gaskets at each end of the sleeve. Sleeves with only an O-ring around the tapped hole are not approved. Tapping sleeves shall be Mueller and shall be rated for 200 psig working pressure.

Tapping valves shall meet all of the requirements of 215-1.2 of these Special Provisions, with the exception of items such as oversized seat rings to allow entry of the tapping machine cutter.

215-1.8 Miscellaneous Small Valves. Miscellaneous small valves shall be as specified in the Plans or Specifications. Where not specifically labeled, valves smaller than 3-inch shall be lever-operated ball valves, per City Standard Plan No. T703 and T704.

215-1.9 Air and Vacuum Release Valves. Air and vacuum release valves shall be per City Standard Plan No. T708.

215-1.10 Corporation Stop. The bronze corporation stops and accessories shall be per City Standard Plan No. T702 and T703.

215-1.11 Valve Boxes. Valve boxes shall be in accordance with City Standard Plan No. T712.

215-2 FIRE HYDRANTS. Fire hydrants shall be as manufactured by The James Jones Company, Model J-3700 or J-3765 as shown on the Plans and shall conform to the requirements of AWWA C503. Each fire hydrant shall be assembled with a gray-iron 6-inch nominal diameter hydrant extension with break-away grooves and flanged ends, and a gray-iron 6-inch nominal diameter hydrant bury with top end flanged and bottom end having a mechanical joint connection. Flanges shall be 6-hole pattern. The hydrant flange shall be connected to the extension by means of breakaway bolts in accordance with AWWA C110, per City Standard Plan No. T705 and T706.

215-3 BLOW-OFF ASSEMBLY. Blow-off assemblies shall be as indicated in City Standard Plan No. T707.

215-4 INSULATING COUPLINGS, BUSHINGS AND UNIONS. Insulating couplings, bushings and unions shall be furnished to provide dielectric protection from electrolytic corrosion at all points where piping and fittings of dissimilar metals are joined, as manufactured by Smith Blair; Corrosion Control Products, Co.; or approved equal. Couplings, bushings, and unions shall be lined with an inert, non-conductive, linen impregnated material and threaded to NPS standards, with sufficient separation between pipe ends to prevent bridging.

215-4.1 Insulating Flange Kits. Kits shall be furnished as shown on the Plans and shall consist of a dielectric gasket, insulating sleeves and washers.

a) Gaskets. Gaskets shall be Type "E" neoprene faced phenolic material for operation between 20 and 150 degrees Fahrenheit per ANSI B16.21.
b) Insulating Sleeves. Insulating sleeves shall be 1/32-inch thick, full length, CE phenolic tubing for operation between 20 and 150 degrees Fahrenheit. For installation at threaded valve flanges, the sleeves shall be half-length.
c) Insulating Washers. Insulating washers shall be laminated CE phenolic for operation at ambient temperatures to be placed directly adjacent to the flange face.

Moisture, soil, or other foreign matter must be carefully prevented from contacting any portion of the mating surfaces prior to installing insulator gasket. If moisture, soil, or other foreign matter contacts any portion of the surfaces, the entire joint shall be disassembled, cleaned with a suitable solvent, and dried prior to re-assembly.

215-5 SERVICE LATERALS. New service laterals shall be Type K soft copper and shall conform to City of Torrance Standard Plan Nos. T702, T703 and T704. Sizes of service laterals to be installed are as shown on the Plans.

No joints shall be made in service lateral runs without the Engineer's approval. All joints so allowed shall be silver-solder joints.

215-6 WATER METERS. Size of water meters shall be as shown on the Plans and conform to one of the following types:

215-6.1 Displacement Type – ¾", 1", 1- ½" and 2" Cold Water Meters. Meters shall be displacement meters of the flat nutating disc type conforming to the requirements of AWWA C700 modified as follows:

1) Meter Maincase. All meters shall be constructed of an NSF 61 approved alloy with the serial number and NSF 61 certification stamped on the maincase. All meters shall have a split design secured by bronze or stainless steel bolts. Epoxy coating is not acceptable.

2) Register. The registers shall record the flow of the meters. The registers shall be radio compatible and be of the digital E-coder registration type, which will allow for leak detection and backflow detection. The registers must be compatible with the R900 meter interface unit. The registers shall be serviceable without interruption of the meter's operation.

   All meters must be adaptable to a digital encoder register without interruption of the customer's service for the purpose of pit, remote, or central meter reading.

   The register shall be secured to the maincase by means of a plastic tamperproof seal pin to allow for in-line service replacement. Seal screws are not accepted.

   Register retainer rings shall have an impact-resistant design which absorbs register glass lens impact. All registers shall have the size, model, and date of manufacture stamped on the dial plate.

3) Measuring Chamber. The measuring chamber shall be of a 2-piece snap joint type. The chamber shall be made of non-hydrolyzing synthetic polymer, shall be smoothly and

accurately machined, and shall contain a removable molded diaphragm of the same material as that of the chamber. No screws shall be used to secure the chamber together.

The control block shall be the same material as the measuring chamber and be mounted on the chamber top to provide sand ring protection. The control block assembly shall be removable to facilitate repairing. Control block assemblies shall be designed as not to allow any magnetic slippage which would result in a loss of revenue.

The measuring chamber outlet port shall be sealed to the maincase outlet port by means of an O-ring gasket to eliminate chamber leak paths.

The chamber is a nutating disc type, the flat nutating disc shall be three-piece construction molded of a non-hydrolyzing hard rubber and shall contain a type 316 stainless steel spindle. The nutating disc shall be equipped with a synthetic polymer thrust roller with a stainless steel shaft located within the disc slot. The roller head shall roll on the buttressed track provided by the diaphragm in the measuring chamber.

4) Strainer. All meters shall contain removable polypropylene plastic strainer screens. The strainer shall be located near the inlet maincase port, before the measuring chamber and control block assembly.

5) Performance. Registers must be guaranteed for ten (10) years and meter interface units guaranteed for 20 years (10 full, 10 operated). All meters shall be guaranteed for one (1) year on material and workmanship. To ensure accuracy, each meter must be accompanied by a factory test tag certifying the accuracy at the flows required by AWWA C700 (low, intermediate, and full flow). Manufacturer must have a minimum of 15 years experience in manufacturing absolute encoder registers.

6) Manufacturer. Meters shall be Neptune T-10 meters with E-code registers by Neptune Technologies Group or approved equal.

7) Systems Guarantee. All meters shall be guaranteed adaptable to the Neptune ARB Encoder, Central Meter Reading, Tricon, Neptune Manual Reading (NMR), the Unigun Electronic Meter and R900i. All meters shall have a written guarantee to work with the R900i in agreement with Neptune Technologies Group.

215-6.2 Compound-Type 3" & 4" Cold Water Meters. Meters shall conform to AWWA C702 and be constructed of an NSF 61 approved alloy and have the NSF 61 certification stamped on the maincase.

1) Type. Compound meters shall consist of a combination of an AWWA Class II turbine meter for measuring high rates of flow and anutating disc type positive displacement meter for measuring low rates of flow, enclosed in a single maincase. An automatic valve shall direct flows through the disc meter at low flow rates and through the turbine meter at high flow rates. At high flow rates, the automatic valve shall also serve to restrict the flow through the disc meter to minimize wear.

2) Operating Characteristics. The meters shall comply with the operating characteristics shown below:

Size	Maximum Capacity (gpm)	Maximum Continuous Flow (gpm)	Maximum Loss of Head at Max Cont. Flow (psi)	Normal Operating Range (gpm)	Low Flow (gpm)
3"	450	350	8	½ -- 350	1/8
4"	1000	700	8	1 – 700	1/2
6"	2000	1400	8.5	1-1/2 – 1400	3/4

3) Size. The size of meters shall be determined by the nominal size (in inches) of the opening in the inlet and outlet flanges. Overall lengths of the meters shall be as follows:

Meter Size	Laying Length
3"	17"
4"	20"
6"	24"

4) Case and Cover. The maincase and cover shall be cast of an NSF 61 approved alloy and have the NSF 61 certification stamped on the maincase. The size, model, and arrows indicating direction of flow shall be cast in raised characters on the maincase or cover. The cover shall contain a stainless steel calibration vane for the purpose of calibrating the turbine measuring element while the meter is in-line and under pressure. The calibration vane shall contain no gear reduction. A test plug shall be located in the maincase or the cover for the purpose of field testing the meter.

5) External Bolts. Casing bolts shall be made to Type 316 stainless steel.

6) Connections. Maincases shall be round flanged per Table 4, AWWA C702.

7) Registers. Separate magnetic-drive registers shall record the flow of the turbine and disc meters and their total will be the registration of the compound meter. The registers shall be radio compatible and be of the digital E-coder registration type, which will allow for leak detection and backflow detection. The registers must be compatible with the R900 meter interface unit. The registers shall be serviceable without interruption of the meter's operation.

8) Register Boxes. The name of the manufacturer and the meter serial number shall be clearly identifiable and located on the register box covers.

9) Register Box Sealing. Registers shall be affixed to the cover by means of a plastic tamperproof seal pin that must be destroyed in order to remove the register.

10) Meter Serial Number. The meter serial number shall be imprinted on the meter flange as well as the register box covers.

11) Measuring Chambers. The measuring chamber shall be a self-contained unit, attached to the cover for easy removal. The turbine spindles shall be tungsten carbide or 316 stainless steel with tungsten carbide inserts and shall rotate in removable graphite bushings. Thrust bearings shall be tungsten carbide.

The nutating disc chamber shall be a self-contained unit mounted on the cover and easily removable from the cover. It shall conform to AWWA C700 for the following sizes: 3" -- 5/8" disc, 4" -- 3/4" disc and 6" -- 1" disc.

12) Intermediate Gear Train - Turbine Section. The intermediate gear train shall be directly coupled from the turbine spindle and magnetically coupled to the register through the meter cover. The gear train shall be enclosed in the turbine rotor outlet and shall be capillary sealed. All moving parts of the gear train shall be made of a self-lubricating polymer or stainless steel for operation in water.

13) Automatic Valve. The automatic valve shall be of the spring loaded, poppet type. All valve parts shall be made of water works bronze, stainless steel, or a suitable polymer with a replaceable semi-hard EPDM rubber seat. Only the cover must be removed to gain access to the valve for inspection or service.

14) Strainer. A strainer shall be provided for the disc meter. It shall be easily removable and have an effective straining area of at least double the disc meter inlet.

15) Performance. Registration accuracy over the normal operating range shall be 98.5% to 101.5%. Registration at the crossover shall not be less than 95%. Registration at the low flow rate shall not be less than 95%.

16) Remote Registration. Registration accuracy with remote registers shall not be less than crossover.

a) Type A. All meters shall be equipped with E-coder absolute encoder registers and R900i meter interface units.

b) Type B. All meters shall be equipped with E-coder registers and R900i meter interface units.

17) Manufacturers. Meters shall be Neptune Tru/Flo Compounds with E-coder registers by Neptune Technologies Group or approved equal.

215-6.3 Fire Service Meter Assembly. The fire service meter assembly shall measure both domestic and fire service water usage through a single water line and shall conform to the requirements of AWWA C703 modified as follows:

1) Type. Fire Service Meter assembly shall consist of a combination of an AWWA Class II in-line horizontal axis turbine for measuring high rates of flow and a positive displacement bypass meter for measuring low rates of flow. An automatic valve shall direct the flow from the bypass meter to the mainline meter as the flow rates increase and back tot he bypass meter as the flow rate decreases. All components of the meter assembly shall be both UL (Underwriter's Laboratory) Listed and FM (Factory Mutual) Approved for fire service use.

2) Capacity. The capacity of the meters in terms of maximum rate for continuous use, normal operating range, maximum loss of head, and extended low flow capability is as follows:

Size	Max. Rate Continuous Use (gpm)	Normal Operating Range (gpm)	Max Loss of Head @ Max Rate (psi)	Extended Low Flow (gpm)

6"	2,500	1-1/2 - 2,500	10.5	1
8"	4000	2 - 4,000	10.5	1

3) Size. The size of the meter shall be determined by the normal size (in inches) of the opening in the inlet and outlet flanges. Overall lengths of the meters shall be as follows:

Meter Size	Laying Length
6"	45"
8"	53"

4) The meter body, strainer body, and valve body shall be fabricated of ASTM A-570, Grade 36 steel with a coating of fusion-bonded epoxy both internally and externally. The meter body shall be welded to the valve body effecting a uni-body construction with the valve. The strainer outlet and meter inlet shall be connected by a Style 77 Victualic or other UL Listed/FM Approved grooved coupling with a Grade E EPDM gasket. The meter assembly shall have a rated working pressure of 175 psi.

   The meter cover shall be cast of water works bronze containing not less than 75% copper. The size, model, arrows indicating direction of flow, and "AWWA Class II" shall be cast in raised characteristics on the cover. The cover shall have a rated working pressure of 175 psi. The cover shall contain a calibration vane for the purpose of calibrating the Class II turbine meter in the mainline.

   A test plug shall be located in the maincase or the cover for the purpose of field testing the meter. The size of the test plug shall provide for sufficient flow for high flow test.

5) External Bolts. Meter cover bolts shall be made to Type 316 stainless steel.

6) Connections. Inlet and outlet flanges shall be round flanged per Table 4, AWWA C702, Class D.

7) Registers. Registers shall be permanently roll-sealed, straight reading in cubic feet. Registers shall include a center-sweep test, hand and low flow indicator. Registers shall be removable for replacement without interruption of the service line.

8) Register Box. Register boxes and covers shall be of bronze composition. The name of the manufacturer and the meter serial number shall be clearly identifiable and located on the register box cover.

9) Register Box Sealing. The register shall be affixed to the maincase by means of a tamperproof seal pin that must be destroyed in order to remove the register.

10) Meter Serial Number. The meter serial number shall be imprinted on the meter flange or cover as well as the register box cover.

11) Measuring Chambers. The turbine measuring element shall be a self-contained unit attached to the cover for easy removal from the meter body. As a unit, the turbine measuring element, cover, and register shall be calibrated and replaceable by any other like-calibrated unitized measuring element.

12) Intermediate Gear Train. The intermediate gear train shall be directly coupled to the turbine spindle and magnetically coupled to the register through the meter cover. The gear train

shall be enclosed within the turbine measuring chamber. All moving parts of the gear train shall be made of self-lubricating polymer or 316 stainless steel for operation in water.

13) Bypass Meter. The bypass meter shall be of a positive displacement, nutating disc type. The bypass meter shall conform to AWWA C700 standards in the following sizes:

6" Mainline	1- 1/2" Bypass Meter
8" Mainline	2" Bypass Meter

14) Automatic Valve. The automatic valve shall be of a spring loaded, knuckle-joint type. All internal linkage parts shall be stainless steel. A vulcanized rubber disc on a stainless steel clapper plate shall seal against a bronze seat. The springs shall be type 18-8 stainless steel.

15) Strainer. A stainless steel basket-type strainer shall be provided. It shall prevent debris from passing through the meter and blocking flows downstream as well as protecting the turbine element. The strainer shall be provided with a flushing port to permit easy removal of sediment from the bottom of the strainer.

16) Performance. Registration accuracy over the normal operating range shall be 98.5% to 101.5%. Registration at the crossover shall not be less than 90%. Extended low flow registration shall not be less than 95%.

17) Remote Registration.

a) Type A - All meters shall be equipped with digital encoder remote registers per AWWA C707 and shall include all required hardware for installation and account number insertion. Three-wide cable is not to be included in quoted meter prices.

b) Type B - All meters shall be equipped with generator remotes per AWWA C706 and shall include all required hardware for installation. Two-wire cable is not to be included in quoted meter prices.

18) Manufacturers. The fire service meter assembly shall be Neptune HP Protectus III by Neptune Technologies Group or approved equal.

215-7 WATER METER BOX. The Contractor shall furnish water meter boxes as follows:

3/4", 1" Meters: Armorcast Box #33 (A6000486) with Cover #33 (A600483).

1-1/2", 2" Disc or Turbine Meters: Armorcast Box #66 – A6001640, PCX12 with Cover #66 – A6001643 (Non-Traffic Areas), #66 – A6001947T (Traffic Areas)

1-1/2", 2" Compound Meters: Armorcast Box #66 – A6001974, PCX12 with Cover #67 – A6001975 (Non-Traffic Areas), #67 – A6001947T (Traffic Areas).

215-8 FLEXIBLE COUPLINGS. Unless otherwise specified, flexible couplings shall conform to the following:

1) Each coupling shall consist of one steel middle ring, two steel followers, gaskets, and sufficient numbers of Type 316 stainless steel bolts to compress the gasket without distorting the followers.

2) The thickness of the middle ring shall be such that the stress in the steel shall not exceed 50 percent of the yield point when subjected to the hydrostatic test pressure of the pipeline. The pressure rating shall be no less than the indicated design pressure. The middle ring thickness shall not be less than the thickness of the pipe jointed.

3) Middle rings shall be cold expanded a minimum of one-percent increase in diameter to test the weld and the size of the proper dimension.

4) The middle rings shall be coated with Keysite 740 or approved coating to a minimum dry film thickness of 10 mils. Follower rings shall be coated with a compatible shop coat for field coating.

5) Bolts shall be 5/8-inch diameter carriage bolts with hexagon nuts. The steel shall have minimum yield strength of 40,000 psi.

6) Buried coupling shall be coated with fusion bonded epoxy and provided with Type 316 stainless steel bolts and nuts.

7) Provide thrust ties where shown and where required to restrain the force developed by 1-1/2 times the operating pressures specified. Attach thrust ties to ductile iron pipe with socket clamps against a grooved joint coupling or flange.

8) Flexible couplings shall be by one of the following manufacturers: Baker, Dresser, Rockwell or Ford

215-9 FLANGE INSULATION KITS. Insulating material shall be of the type designated by the manufacturer as suitable for the operating temperature and pressure of the service. Flange insulation kits shall consist of:

1) Insulating Gaskets: Gaskets shall be full-faced, 1/8" minimum thickness, dielectric neoprene faced phenolic. Gaskets shall be Johns-Manville No. 71 dielectric sheet packing, Raybestos-Manhattan No. 73, Linebacker Type E, or approved equal.

2) Insulating Sleeves and Washers: Insulating stud sleeves and washers shall be one-piece and full length, made of Minlon. One 1/8" thick gasket will be attached to the sleeve, while the other one will be loose. Single insulating washers and sleeves shall be used on buried insulating flanges. Double insulating washers and sleeves shall be used on insulating flanges above ground or in vaults.

3) Insulating Washers for Bolts: Insulating washers shall 1/8" thick phenolic. Single insulating washers shall be used on buried insulating flanges. Double insulating washers and full length sleeves shall be used on insulating flanges above ground or in vaults.

4) Steel Washers Over Insulating Washer: Steel washers shall be 1/8" thick Type 316 stainless steel.

5) Compatibility with Tapping Valves: If the insulating is not compatible with tapping valve, an additional flanged spool or prefabricated insulating joint will be required.

6) Manufacturers: Flange insulation kits shall be manufactured by PSI Industries, Central Plastics Company, APS (Advance Product & Systems) or approved equal.

SECTION 217 - SIGNAGE

217-1 ROADSIDE SIGNS. All roadside signs shall conform to the provisions of Section 56-2 of the Caltrans Standard Specifications amended as follows:

56-2.02 Materials. Revise the entire subsection with the following:

The various materials and fabrication thereof of roadside signs shall conform to the requirements of 56-2.02 A and 56-2.02 D.

56-2.02A Metal Posts. Delete the first paragraph.

PART 3 - CONSTRUCTION METHODS

SECTION 300 – EARTHWORK

300-1 CLEARING AND GRUBBING.

300-1.3 Removal and Disposal of Materials.

300-1.3.1 General. Replace the entire subsection with the following:

Unless otherwise stated on the Plans or Specifications, all material removed from the Work shall become the property of the Contractor and shall be disposed of in a lawful manner. Removals shall include, but not limited to, all excess excavation material, trees and plants, debris, interfering portions of curb, gutters, asphalt and PCC concrete pavements and sidewalks (including base, where applicable), and miscellaneous items as shown on the Plans. The Contractor shall conform to the following requirements:

1) The Contractor shall not start any removal work unless it is prepared to perform reconstruction work within 24 hours of the time removals were begun, unless otherwise approved by the Engineer.

2) The Contractor shall complete forming and pouring of PCC construction within five (5) working days following the removal of existing material at any location.

3) The Contractor shall not remove on-site improvements until it is prepared to construct the adjacent street section and shall promptly restore all such improvements as applicable, upon completion of the adjacent street work.

4) The Contractor shall deliver the salvaged water meters, metal water box covers, and fire hydrants to the City Yard located at 20500 Madrona Avenue, Torrance, CA 90503.

All concrete removed shall be hauled off the Work site no later than the calendar day following the day that the removal is performed.

Prior to making removals, the Contractor shall meet with the Engineer to verify the limits of removals, locations of joins, to establish smooth joins and to ensure proper drainage. The Contractor may make minor changes in the location of joins and the limits of removals, provided a smooth join and proper drainage can be achieved and it has obtained prior written approval from the Engineer.

In order to protect the public streets from deterioration due to hauling of materials, the Contractor shall submit, prior to the Pre-Construction Meeting, for approval a proposed route for hauling of materials for disposal. Upon approval, the Contractor shall strictly adhere to that route, unless written permission from the Engineer is obtained to change the route.

300-1.3.2 Requirements.

a) **Bituminous Pavement.** Replace the first and second sentences with the following: Bituminous pavement shall be removed to neatly sawed edges.

Add subparagraphs (d) and (e):

(d) **Trees.** The City maintains a tree conservation policy. Unless otherwise shown, all trees are to be protected in place. Demolition and destruction of trees and tree parts, including trunks, branches and foliage, shall be limited to tree removals as shown on the Plans. Root pruning and removals shall be limited to the minimum required to construct new improvements where trees are to be conserved.

The Contractor shall notify the Engineer 72 hours in advance of any tree pruning required for construction. Tree pruning required for construction shall be performed by the Public Works Department, Streetscape Division.

The Contractor shall conform to the following requirements:

1) The cutting down or removal of trees is prohibited after the prescribed working hours unless permission is granted by the Engineer.

2) All debris from pruning or removing a tree shall be cleaned up and hauled away from the Work site on the same day that the tree is cut or pruned. Firewood-size logs may be left neatly piled for residents to pick up for no longer than three (3) days.

3) All holes created from removal of tree stumps shall be backfilled and graded to finish level by the end of the workday.

4) Sprinkler systems disrupted by the Contractor shall be capped or restored by the end of the workday. Capped systems shall be restored to original working condition within three (3) days.

(e) **Miscellaneous Removals and Relocations.** This work shall include all removals not specifically listed in the Proposal or otherwise covered by these Specifications, and all necessary relocations and restorations of walls, fences, plants, hardscape, signs and other items, whether shown on the Plans or not, and as necessary to complete the improvements.

Add the following section:

300-1.3.3 Construction and Demolition Debris Recycling.

General. Consistent with the Agency's efforts to comply with the California Integrated Waste Management Act of 1989 (AB 939), the Contractor shall reduce, reuse, and/or recycle to the maximum extent feasible, the construction and demolition debris (debris) generated by this

Contract hereby diverting the debris from disposal facilities, saving landfill space, and conserving virgin materials and natural resources.

Definitions.

"Construction and Demolition Debris or Debris" means materials resulting from building, construction or demolition-related activities such as excavation, grading, land clearing, renovation, repair, road work and site cleanup and are considered solid waste pursuant to Section 40191 of the California Public Resources Code. The materials include, but are not limited to, asphalt, brick, cardboard, carpet, cinder block, concrete, concrete with reinforcement bars, drywall, excavated materials, fixtures and fittings, glass, gravel, green waste, metal, mixed rubble, packaging materials, paper, plastics, porcelain, road work materials, roofing materials, rock, sand, site clearance materials, soil, trees, tree stumps and other vegetative matter, stones and wood waste.

"Deconstruction" means the process of carefully dismantling a structure, piece by piece prior to or instead of conventional demolition, to maximize the recovery of building materials for reuse and/or recycling.

"Delivery Site" means recycling facility as defined in Subsection E.14 and recycling or reuse site as defined in Subsection E.15 or any place, including a transfer station as defined in Subsection E.20 where the debris is delivered for the sole purpose of reuse and/or recycling in a manner acceptable to the Director/Designee.

"Disposal" means the process of disposing of debris at a Disposal Facility.

"Disposal Facility" means a Landfill or any location where the debris is taken for Transformation as defined.

"Generation" means the quantity of debris produced by the Work before the debris is reused and/or recycled.

"Green Waste" means all vegetative cuttings, shrubs, stumps, logs, brush, tree trimmings, grass, and related materials which have been separated from other solid waste.

"Landfill" means a solid waste disposal facility that accepts solid waste for land disposal and is operating under a current Solid Waste Facility Permit issued by a local enforcement agency as defined in Section 40130 of the California Public Resources Code and concurred upon by the California Integrated Waste Management Board.

"Recyclable" means material that still has useful physical or chemical properties after serving its original purpose and that can be reused or re-manufactured into additional products.

"Recycle or Recycling" means the process of collecting, sorting, cleansing, treating, and reconstituting materials that would otherwise become solid waste and returning them to the economic mainstream in the form of raw materials for new, reused, or reconstituted products which meet the quality standards necessary to be used in the marketplace, and in a manner acceptable to the Agency. "Recycle" or "Recycling" does not include Transformation.

"Recycling Facility" means any facility (except a transformation facility) whose principal function is to receive, store, convert, separate, or transfer recyclable materials for processing.

"Recycling or Reuse Site" means any place other than a recycling facility acceptable to the Agency for recycling and/or reuse of debris.

"Reduce" means any action which causes a net reduction in the generation and/or disposal of solid waste.

"Reuse" means the use, in the form as it was produced, and in a manner acceptable to the Agency of materials which might otherwise be discarded into a Disposal Facility.

"Site Clearance Material" means materials such as trees, brush, earth, mixed concrete, rubble, sand, steel, extraneous paper, plastics, and other waste materials generated from site clearance.

"Source Separation" means the segregation, by the generator, of materials designated for separate collection for materials recovery or special handling.

"Transfer Station" means a facility utilized to receive solid wastes and to temporarily store, separate, convert, or otherwise process the materials in the solid wastes, and/or to transfer the solid wastes directly from smaller to larger vehicles or railroad trains for transport.

"Transformation" means incineration, pyrolysis, distillation, gasification, or biological conversion other than composting.

"Wood Waste" means solid waste consisting of wood pieces or particles which are generated from the manufacturing or production of wood products, harvesting, processing or storage of raw wood materials, or construction or demolition activities.

RECYCLING SUMMARY.

The Contractor shall prepare and submit a Recycling Summary report using the form included as Appendix IV summarizing the disposal, reuse, and/or recycling activities which occurred throughout the Contract duration. This report shall be submitted by the Contractor to the Agency, before or with its request for the final Progress Payment for said Contract.

Failure of the Contractor to submit the Recycling Summary within the time specified will result in damages being sustained by the Agency. Such damages are, and will continue to be, impracticable and extremely difficult to determine. For failure to submit the Recycling Summary, as required, the Contractor shall pay to the Agency, or have withheld from monies due it, the sum of $10,000 for a contract of $500,000 or more. The Contractor shall pay to the Agency, or have withheld from monies due it, 2% of the total contract amount for a contract of $499,999 or less.

Execution of the Contract shall constitute agreement by the Agency and Contractor that $10,000 (2% for contracts $499,999 or less) is the minimum value of the costs and actual damage caused by the failure of the Contractor to submit the Recycling Summary within the time specified. Such sum is liquidated damages and shall not be construed as a penalty, and may be deducted from payments due the Contractor.

PAYMENT.

The cost of construction and demolition debris recycling and completing the Recycling Summary report shall be considered as included in the Contract Unit Price for the various Bid

items. The quantities reported will be used for information gathering purposes and not for purposes of payment to the Contractor.

300-1.4 Payment. Replace the entire subsection with the following:

When the Contract does not include a pay item for clearing and grubbing, payment under this section shall be by the following:

a) **Bituminous Pavement.** Payment for the removal and disposal of bituminous pavement for construction of local depression, alley intersection and cross gutters/spandrels shall be considered as included in the Contract Unit Price for the appurtenant items of work, and shall include sawcutting, removal of underlying subgrade and base, disposal, subgrade preparation and compaction, labor and equipment.

b) **Concrete Pavement, Cross-Gutters and Alley Intersections**. Payment for removal and disposal of concrete pavement, cross-gutters, alley intersection and local depression shall be included in the Contract Unit Price for the appurtenant items of work and shall include sawcutting, complete removal of underlying subgrade and base, disposal, and all labor and equipment necessary to complete the required removal.

c) **Concrete Curb, Walk, Gutters and Driveways**. Payment for removal and disposal of concrete curb, curb and gutter, walk, and driveways shall be included in the Contract Unit Price for the appurtenant items of work. Removals shall include sawcutting, root pruning, complete removal of underlying subgrade and base, subgrade preparation and compaction, disposal, and all labor and equipment necessary to complete the required removal.

d) **Trees.** Payment for tree removals and disposal shall be per the Contract Unit Price and shall include all work involved in tagging, cutting and complete removal of trunks, branches, stumps and roots; hauling, disposal, restoration and replanting of removal areas; and other appurtenant work.

e) **Miscellaneous Removal and Relocations.** Payment for miscellaneous removals and relocations shall be per the Contract Unit Price, and shall include full compensation for excavation, backfilling, grading, trimming plants, import if required, placing of top soil, disposing of surplus material and appurtenant work.

f) **Painted Curb**. There is no separate payment for removal of paint on concrete curb. Full compensation for furnishing all labor materials, tools, equipment and incidentals as shown on the plans and specified in these Special Provisions shall be included in the contract unit price for traffic striping, markings and pavement markers.

300-2 UNCLASSIFIED EXCAVATION.

300-2.2 Unsuitable Material.

300-2.2.1 General. Replace the first paragraph with the following:

If unsuitable material is found, the Contractor shall remove said material to the limits to be determined by the Engineer and shall replace said material with select fill or base material, as to be

determined by the Engineer. Payment for removal and replacement shall be made as Extra Work or Force Account Work.

Alternatively, as determined and directed by the Engineer, the Contractor shall install geotextile fabric (Per Section 213 ENGINEERING FABRICS of these Special Provisions) on the subgrade to the limits determined by the Engineer in lieu of unsuitable material excavation and CAB backfill.

Payment for unsuitable material excavation and backfill shall be measured and paid for as Unclassified Excavation and Crushed Aggregate Base, respectively.

Payment for geotextile shall be per Section 300-10 GEOTEXTILES FOR SEPARATION of these Special Provisions.

300-2.9 Payment. Add the following:

Payment for the removal and disposal of bituminous pavement for street reconstruction areas shall be considered as included in the Contract Unit Price for REMOVE EXISTING STRUCTURAL SECTION AND UNCLASSIFIED MATERIALS TO A DEPTH OF 6-INCHES and shall include sawcutting, removal of underlying subgrade and base, disposal, subgrade preparation and compaction, labor and equipment.

300-10 GEOTEXTILES FOR SEPARATION

300-10.1 Subgrade Enhancement. Replace the entire subsection with the following:

Geotextiles for subgrade enhancement shall be non-woven and conform to 213-1 of these Special Provisions.

300-10.1.1 Placement. Replace the first paragraph with the following:

The installation area shall be prepared by clearing all debris or obstructions which may damage the geotextile. Trees and large bushes should be cut at ground level. In most cases, all native vegetation, roots and topsoil must be removed from the roadway subgrade prior to geotextile placement. Where required by the Contract Documents, soft and otherwise unsuitable areas shall be identified, excavated, and backfilled with selected material in accordance with 300-2.2 of these Special Provisions. Stabilization of these areas may be enhanced by use of a geotextile at the bottom of the excavation before backfilling. However, when designed for soft or wet subgrade conditions, native vegetation, roots, and topsoil may be left in place so as to limit disturbance and resulting shear strength loss of the subgrade soil.

Add the following after the third paragraph:

If site conditions require geotextile seaming, the geotextile shall be cut and seamed on the curve. The fold or overlap shall be in the direction of construction and shall be held in place as prescribed above.

Replace the eighth paragraph with the following:

The aggregate base or subbase (aggregate) shall be placed by end dumping adjacent to the geotextile or over previously placed aggregate. End dumping or tail gate dumping of aggregate on the geotextile will not be permitted. The aggregate shall be spread from the backdumped pile using a lightweight dozer or skip loader. A sufficient thickness of aggregate should be in place prior to dumping to minimize the potential of subgrade pumping and localized subgrade failure.

Equipment shall not be allowed directly on the fabric.

The aggregate shall be placed on the geotextile in lifts not less than 6 inches thick. Traffic shall not be permitted directly on the geotextile. Sudden stops or turns by equipment operating on aggregate placed over the geotextile shall be avoided. A smooth drum roller shall be used to achieve specified aggregate density. Any ruts occurring during construction shall be filled with additional aggregate and compacted to the specified density. Vibratory compaction shall not be used on the initial lift over the geotextile.

Replace the ninth paragraph with the following:

Damaged geotextiles, as identified by the Engineer, shall be repaired immediately. The damaged area plus an additional 3 feet around the damaged area shall be cleared of all fill material. A geotextile patch extending 3 feet beyond the perimeter of the damage shall be constructed as directed by the Engineer. Sewing of a geotextile patch may be required over soft subgrades as directed by the Engineer. Damaged geotextiles shall be repaired at no cost to the CITY.

Add the following section:

300-12 MOISTURE BARRIER

300-12.1 General. Moisture barrier placed adjacent to all median planting areas shall conform to 213-3 of these Special Provisions.

300-12.2 Placement. Moisture barrier shall be placed prior to topsoil placement and landscaping. Placement shall be in accordance with the project plans and details and the manufacturer's recommendation.

300-12.3 Measurement and Payment. Measurement and payment for Moisture Barrier shall be measured per linear foot of moisture barrier placed, not including any barrier for overlaps and splices.

SECTION 301 – TREATED SOIL, SUBGRADE PREPARATION, AND PLACEMENT OF BASE MATERIALS

301-2 UNTREATED BASE.

301-2.1 General. Add the following:

Base is required under all PCC and AC improvements as shown on the Plans. Additional base may be required after review of work areas following removals. Prior to constructing new improvements, the Contractor shall verify with the Engineer that the base sections as shown on the Plans (including areas where no base is called for) are adequate. Payment for any changes shall be made pursuant to Section 3.

A minimum of 8-inches CAB shall be placed under curb, curb and gutter, cross gutters, spandrals and concrete bus pads. A minimum of 6-inches CAB shall be placed under driveways (includes portion to right-of way/property line), alley intersections, local depressions, stained median concrete (maintenance vehicle pullouts) and AC or PCC pavement on private property as part of driveway reconstruction. A minimum of 4-inches CAB shall be placed under sidewalks, access ramps and stained median concrete (noses and mow strip).

301-2.4. Measurement and Payment. Delete the second paragraph and add the following:

Payment for construction of CAB under AC pavement, cross gutters and bus pads shall be included in various items of work.

Payment for construction of CAB under curb, curb and gutter, driveways, local depressions, sidewalks, stained median concrete paving and access ramps shall be considered as included in the unit price bid for various items of work and no additional compensation will be allowed therefore.

SECTION 302 – ROADWAY SURFACING

302-4 EMULSION-AGGREGATE SLURRY

Prior to emulsion aggregate slurry, crack sealing shall be performed by the City Public Works Department on Rolling Hills Road. The Contractor will apply emulsion-aggregate slurry on Rolling Hills Road from Crenshaw Boulevard to City boundary.

On Western Avenue, the lane affected by water main trench shall have emulsion aggregate slurry applied.

302-4.1 Materials. Replace the entire subsection with the following:

Materials for emulsion-aggregate slurry shall conform to 203-5 of these Special Provisions.

302-4.3 Application

302-4.3.1 General. Replace the second sentence of the first paragraph with the following:

Type II slurry shall be applied at the application rate shown in Table 302-4.3.1(A).

302-4.3.2 Spreading. Add the following to the first paragraph:

If rippled or chatter marks appear in the surface of the finished slurry, a slower rate of spread shall be required to prevent these surface blemishes that will negatively affect ride quality.

302-4.4 Public Convenience and Traffic Control. Modify the third sentence of the first paragraph to read:

Based upon the spreading schedule, the Contractor shall notify residents and businesses of the work and post temporary "No Parking" signs at least 48 hours in advance of sealing operations in accordance with 7-10.1.5 of these Special Provisions.

302-4.5 Measurement and Payment. Replace the first sentence with the following:

Payment for emulsion-aggregate slurry shall be per the Contract Unit Price.

302-5 ASPHALT CONCRETE PAVEMENT.

302-5.1 General. Add the following sentence at the end of the first paragraph:

When the Plans, Specifications or Standard Plans inadvertently specify B-AR-4000, C2-AR-4000 and /or D2-AR-4000, the equivalent replacement courses shall be B-PG 64-10 for B-AR-4000, C2-PG 64-10 for C2-AR-4000, and D2-PG 64-10 for D2-AR-4000.

302-5.2 Cold Milling Asphalt Concrete Pavement

302-5.2.1 General. Add the following after the first paragraph:

Cold Milling shall include edge milling, header milling and profile milling as necessary to provide the required grades and allow for a smooth pavement profile in preparation for asphalt concrete overlay paving. Milling limits shown on the plans are approximate. The Engineer may direct the Contractor to cold mill in other areas, as necessary for construction. Some adjustment of limits and depths will be necessary to accommodate paving requirements. Cold milling shall be to the depth as specified or directed, or to the underlying base material, pavement fabric, or macadam material. Milling depth shall be adjusted so as not to remove any macadam encountered. Care shall be exercised not to damage adjacent concrete including curbs without gutters. Gutters or curbs damaged shall be replaced at the Contractor's expense. There are areas within the project that require cold planing which are inaccessible to the type of milling machine as described herein above. Some of these areas include local depressions, curb return, curbs without gutters, utility manholes and vaults. The Contractor shall be required to use a smaller hand machine or other device to cold plane the required horizontal limits and depth at those locations.

Add the following after the third paragraph:

The Contractor shall apply any leveling course at least one day prior to placing either an AC or ARHM overlay. Payment for AC Leveling Course shall be per the contract unit price for CONSTRUCT 2" ASPHALT CONCRETE (C2-PG64-10) OVER 4" ASPHALT CONCRETE (b-PG64-10) OVER EXISTING SUBGRADE COMPACTED TO 95% and CONSTRUCT 3" ASPHALT CONCRETE (B-PG64-10).

302-5.2.6 Measurement and Payment. Replace the first paragraph with the following:

Cold milling will be measured by the square yard. Payment for cold milling shall be per the Contract Unit Price per square yard for REMOVE EXISTING STRUCTURAL SECTION AND UNCLASSIFIED MATERIALS TO A DEPTH OF 6-INCHES and GRIND EXISTING STREET SECTION TO A DEPTH OF 3-INCHES, complete up to the depth specified, including disposal of milled material, and shall include construction, removal and disposal of temporary asphalt concrete ramps as specified in 302-5.2.5.

302-5.4 Tack Coat. Replace the first sentence of the first paragraph with the following:

If the asphalt concrete pavement is being constructed directly upon an existing hard-surfaced pavement, a tack coat of viscosity grade AR 4000 or AR 8000, or performance grade PG 64-10 paving asphalt conforming to 203-1 applied at an approximate rate of 0.25 L/m^2 (0.05 gallon per square yard), or SS-1h emulsified asphalt applied at an approximate rate of 0.25 L/m^2 to 0.45 L/m^2 (0.05 to 0/10 gallon per square yard), shall be uniformly applied upon the existing pavement preceding the placement of the asphalt concrete.

Add the following paragraph:

A Tack Coat shall be applied between base and finish courses when the finish course is not placed immediately after the base course, and to existing paved surfaces where new asphalt concrete overlaps or abuts existing pavement. Tack Coat shall be as specified in Section 302-5.4. There shall be no separate payment for Tack Coat.

302-5.5 Distribution and Spreading. Delete the fourth paragraph and substitute the following:

Asphalt concrete shall not be placed until the atmospheric temperature is a minimum of 10°C (50°F) and rising, and the surface temperature of the underlying material is a minimum of 4°C (40°F). Asphalt concrete shall also not be placed during unsuitable weather.

Fully automatic screeds will be required on this Project. A fully automatic screed shall have a sled, 9.1m (30 feet) in length, on the side of the machine which will receive the next mat of material. A joint maker, ski, etc., placed on the side of the machine to ride on the existing or previously constructed surface or mat of asphalt concrete material may be required as directed by the Engineer.

Delete Table 302-5.5(A) and substitute the following:

TABLE 302-5.5(A)

Specified Total Thickness of Pavement		Required Number of Courses	Class Of Mixture
Greater Than mm(Inches)	But Not More Than mm(Inches)		
0	25mm (1)	1	D2-PG 64-10
25mm (1)	38mm (1-1/2)	1	D2-PG 64-10
38mm (1-1/2)	75mm (3)	1	C2-PG 64-10
75mm (3)	100mm (4)	2	Base Course - B-PG 64-10 Finish Course - C2-PG 64-10 or as directed
100mm (4)	-	2 or more	Base Course - B-PG 64-10 Other Courses - C2 -PG 64-10 or as directed

302-5.8 Manhole (and other structures). Add the following:

Contractor shall be required to remove manholes and utility access covers to below the depth to be removed and restore said covers to finish grade upon completion of paving.

Add the following subsection:

302-5.8.1 Payment. Payment shall be included in the various items of work.

302-5.9 Measurement and Payment (Asphalt Concrete Pavement). Payment for Asphalt concrete pavement shall be per the Contract Unit Price for CONSTRUCT 2" ASPHALT CONCRETE (C2-PG64-10) OVER 4" ASPHALT CONCRETE (b-PG64-10) OVER EXISTING SUBGRADE COMPACTED TO 95% and CONSTRUCT 3" ASPHALT CONCRETE (B-PG64-10), including subgrade and base preparation, base course, leveling course, tack coat, and all work necessary to install complete in place. There shall be no separate payment for tack coat, header paving or temporary pavement, and all costs for any said item shall be included in the bid price for the work to which it is appurtenant.

302-6 PORTLAND CEMENT CONCRETE PAVEMENT

302-6.1 General Add the following text:

Replacement: Concrete pavement replacement will conform to S.P.P.W.C Standard 132-2. Contractor shall instead be required to install #15M (#5) tie bars, 24"' long with one end bonded 12", at 18" (more or less) on center on the longest dimension joints, unless otherwise approved by the inspector. No tie bar shall be within 3'1/2" of a corner of a replaced section of concrete.

Add the following subsections

302-11 BITUMINOUS PAVEMENT CRACK SEALING

302-11.1 General. Bituminous Pavement Crack Sealing consists of furnishing all labor, equipment, and materials and performing all operations in connection with bituminous pavement crack sealing.

302-11.2 Cleaning. All pavement cracks greater than or equal to 1/4" width shall be cleaned by a hot air lance.

302-11.3 Materials. The crack sealing material shall be an asphalt cement, aromatic rubber extender, oil and a minimum of 20% powdered rubber by weight combined in such a manner as to produce a material with the following properties:

1) WORKABILITY. The material shall pour readily and penetrate large cracks at temperatures below 400° Fahrenheit.

2) CURING. The product shall contain no water or volatile solvents and shall cure immediately upon cooling to a sufficient viscosity to prevent tracking by traffic.

3) LABORATORY EVALUATION. When the sample of the product has been heated at 350° Fahrenheit for two hours, it shall pass the following tests:

   Softening Point (R & B) 135°F Min. (ASTM D312)

   Flexibility A 1/8" thick specimen of the product conditioned to 10°F shall be capable of being bent to a 90° angle over 1" mandrel without cracking.

   The sealer shall be forced into the crack by use of a squeegee.

302-11.4 Measurement and Payment. There shall be no separate payment for Bituminous Pavement Crack Sealing. Full compensation for furnishing labor, materials and equipment and performing all operations in connection with pavement removals shall be included in the prices bid for appurtenant work.

SECTION 303 – CONCRETE AND MASONRY CONSTRUCTION

303-5 CONCRETE CURBS, WALKS, GUTTERS, CROSS GUTTERS, ALLEY INTERSECTIONS, ACCESS RAMPS, AND DRIVEWAYS.

303-5.1 Requirements.

303-5.1.1 General. Replace the first sentence of the first paragraph with the following:

Concrete curbs, gutters, curb and gutters, sidewalks, walks, cross gutters, alley intersections, access ramps, driveways, stained median concrete paving and bus pads shall be constructed of

Portland cement concrete of the class, compressive strength and other requirements prescribed in 201-1.

Replace the first sentence of the second paragraph with the following:

Unless otherwise specified on the Plans, and except as otherwise prescribed in 303-5.1.3 under the heading "Driveway Entrances," the minimum thickness of walks shall be 3-1/2 inches.

303-5.5. Finishing

303-5.5.2 Curb Add the following:

Unless otherwise approved by the Engineer, the entire affected concrete curb, gutter, cross-gutter, or spandrel portion shall be removed by sawcutting the adjacent AC pavement one (1) foot from the edge of the affected area to be removed. Where applicable, the contractor shall reconstruct this one (1) foot wide section either with a 4-inch thick section of AC pavement (C2-AR4000) on a 10-inch thick section of untreated Base **OR** with a 2-inch thick section of AC pavement (C2-AR4000) on a 4-inch thick section of 2-sack cement and sand slurry mix on an 8-inch thick section of untreated Base. If the affected curb and gutter is located in a spandrel, the spandrel shall be sawcut six inches (6") minimum from the flow line of the gutter and the spandrel reconstructed to match the existing spandrel portion to remain and be on 8 inches of untreated Base.

For concrete curb and gutter work located in a spandrel, sawcut spandrel to a distance of six inches (6") minimum from the flow line of the gutter to be removed. The Contractor shall reconstruct the spandrel to match the existing spandrel portion to remain and be on eight inches (8") of untreated Base. No extra payment will be allowed for the PCC spandrel construction.

For concrete curb and gutter reconstruction work adjacent to cold milling areas or areas where adjacent pavement will remain in place, sawcut adjacent AC pavement a distance of one foot (1') from edge of gutter to be removed. The Contractor shall reconstruct this one foot (1') wide section with a 5-1/2" thick section of 2-sack cement and sand slurry mix on eight inches (8") of Crushed Miscellaneous Base. The final surface elevation of the 2-sack cement and sand slurry mix shall be 1-1/8" below edge of gutter elevation to accommodate the 1-1/2" AC overlay and a 3/8" high "lip" along the edge of gutter.

For concrete curb and gutter reconstruction work adjacent to areas of pavement reconstruction, the Contractor has the following 2 options:

1. The entire portion may be removed <u>without sawcutting and removing the adjacent AC pavement</u>; however, any damaged pavement must be removed and temporary AC provided and maintained in its place until the adjacent pavement is removed as per the contract; or

2. Remove the entire affected concrete curb or curb and gutter portion by sawcutting the adjacent AC pavement a distance of six (6) inches from the face of curb or edge of gutter to be removed. The contractor shall reconstruct this six (6) inch wide section with a 2-inch thick section of temporary AC pavement on either Crushed Miscellaneous Base or imported fill with a sand equivalent of 30 or greater.

303-5.5.5. Alley Intersections, Access Ramps, and Driveways. Add the following:

Unless otherwise approved by the Engineer, the entire affected curb and gutter portion shall be removed by sawcutting the adjacent AC pavement one (1) foot from the edge of the PCC gutter. Where applicable, the contractor shall reconstruct this one (1) foot wide section either with a 4-inch thick section of AC pavement (C2-AR4000) on a 10-inch thick section of untreated Base **OR** with a 2-inch thick section of AC pavement (C2-AR4000) on a 4-inch thick section of 2-sack cement and sand slurry mix on an 8-inch thick section of untreated Base. If the affected curb and gutter is located in a spandrel, the spandrel shall be sawcut six inches (6") minimum from the flow line of the gutter and the spandrel reconstructed to match the existing spandrel portion to remain and be on 8 inches of untreated Base. No extra payment will be allowed for the PCC spandrel construction.

PCC Access Ramps shall be constructed at locations shown on the Plans and per California Department of Transportation's Standard Plan No. RSP A88A, included in Appendix X.

Access ramps constructed in existing curb returns may obliterate survey tie points. The Contractor shall give a minimum of three (3) work days advance notice of each location to the Engineer prior to removals so the CITY may reestablish the existing survey tie points.

Detectable Warning Surface. Access ramps shall have a prefabricated detectable warning surface ("DWS") installed with dimensions of 36-inches by 48-inches. The DWS shall be installed in accordance with either the State of California's 2006 Revised Standard Plan RSP A88A or the SPPWC Standard Plan No. 111-3, as called out on the plans, and comply with the requirements of the Americans with Disabilities Act (ADA). Detectable warnings shall consist of raised truncated domes with a base diameter of nominal 0.9 in (23 mm), a height of nominal 0.2 in (5 mm) and a center-to-center spacing ranging from a consistent 1.67 in (43mm) for all spacings to 2.35 in (60 mm) for all spacings.

The detectable warning surface shall be the 1/8-inch thick Surface Applied Panel System with Beveled Edges as produced by ADA Solutions, Inc., (800) 372-0519, www.adatile.com. Local distributors are: HUB Construction Specialties, Inc., Glendale, CA, (800) 889-4482 and HCS-Cutler, Lawndale, CA (310) 973-2018. The color of the detectable warning surface shall be Gray Munsell Color Notation 10BG 3/1. The detectable warning surface shall be installed in accordance with the manufacturer's recommendations and instructions. The manufacturer shall provide a 5-year warranty, guaranteeing replacement when there is a defect in the dome shape, color fastness, sound-on-cane acoustic quality, resilience or attachment. The warranty period shall begin on the date of acceptance of the Contract.

Driveways shall have a concrete thickness of 4 inches for single family residences and 6 inches for all other areas.

Work Requested by a Property Owner. The Contractor is allowed to perform work which is not a part of this Contract and in the project area if the work is requested, and paid for, by a property owner provided that:

a The Contractor shall inform the Engineer of the nature, quantity and location of the work requested by the property owner; and
b The requested work does not impact the schedule or cost of the contract work; and
c The Property owner and Contractor are required to obtain all permits for requested work; and
d The Contractor is required to obtain all inspections and approvals.

303-5.7 Repairs and Replacements. Add the following:

The Contractor shall be responsible to protect all new concrete work from being etched, scratched or otherwise marked following replacement thereof. If new concrete work is marked, the Contractor shall replace it at its expense and no extra costs will be allowed.

303-5.9 Measurement and Payment. Replace the entire subsection with the following:

Payment for concrete curb and curb and gutter (excluding integral curb and curb/gutter associated with driveways, alley intersections and cross-gutters) shall include all joints and keyways, Base, adjacent AC pavement reconstruction, protection of existing trees, parkway restoration, repainting of addresses on curb faces where painted addresses have been removed due to new curb construction and repainting of red curb (top and face) where red curb has been removed due to new curb construction and shall be paid for at the lump sum price for CURB, GUTTER, AND SIDEWALK REPLACEMENT.

Payment for curb and curb gutter transitions to match existing and mountable curbs at connection points and maintenance vehicle pullouts will be measured and paid for at the lump sum price for CURB, GUTTER, AND SIDEWALK REPLACEMENT.

Payment for concrete walks, sidewalks shall include all joints as shown in standard plans and construction details and shall include protection of existing trees, parkway restoration, Base and shall be paid for at the lump sum price for CURB, GUTTER, AND SIDEWALK REPLACEMENT.

Payment for driveways, cross-gutters and spandrels, and integral curbs along driveways and spandrels shall include all joints as shown in standard plans and construction details, reconstruction of adjacent 1' wide AC pavement and shall be paid for at the lump sum price for CURB, GUTTER, AND SIDEWALK REPLACEMENT.

Payment for bus pads shall include all joints as shown in the APWA standard plan and construction plans and shall be paid for at the lump sum price for CURB, GUTTER, AND SIDEWALK REPLACEMENT.

Payment for restoring Portland Cement Concrete paving and Base located on private property behind a newly constructed driveway apron shall be paid for at the lump sum price for CURB, GUTTER, AND SIDEWALK REPLACEMENT.

Payment for alley intersections, including the integral curbs, and reconstruction of adjacent 1' wide AC pavement. shall be paid for at the lump sum price for CURB, GUTTER, AND SIDEWALK REPLACEMENT.

Payment for Access ramps with integral retaining curb for access ramps shall be paid for at the lump sum price for CURB, GUTTER, AND SIDEWALK REPLACEMENT.

Payment for furnishing and installing detectable warning surfaces will be made at the Contract Unit Price for PROJECT AND CONSTRUCTION SIGNS and includes all labor, materials and equipment listed in the manufacturer's instructions/installation procedure.

Payment for local depressions at catch basins shall be included in other related items of work.

SECTION 306 – UNDERGROUND CONDUIT CONSTRUCTION

306-1 OPEN TRENCH OPERATIONS

306-1.1 Trench Excavation

306-1.1.1. General. Add the following:

All trenches shall be sawcut to the bottom of the existing concrete or asphalt section to minimize damage to adjacent pavement. The bottom of the trench shall be excavated uniformly to the grade of the bottom of the pipe and shall be given a final trim using a string line for establishing grade, such that each pipe section when first laid will be continually in contact with the ground along the extreme bottom of the pipe.

Tunneling shall be performed under existing curb, gutter and cross-gutter as shown on the Plans. The Contractor shall exercise caution and care to prevent any damage in tunneling under these structures. There shall be no additional payment for this tunneling work. Payment for this work shall be included in the Contract Unit Price for the installation of the main pipeline.

306-1.1.2 Maximum Length of Open Trench. Replace the first paragraph with the following:

For work areas where the work zone is created by daily lane closures, the total length of work area, covering elements of the Contractor's operation, from exploratory excavations and pavement cutting to pipe installation and placement of base paving, shall be no more than 1,000 feet, or as limited by the applicable permit or traffic control staging plan. The maximum length of open trench shall be 300 feet, or the distance necessary to accommodate the amount of pipe installed within the permitted work hours, whichever is greater. The distance is the collective length at any location, including open excavation, pipe laying and appurtenant construction and backfill which has not been temporarily resurfaced.

The Contractor shall either place backfill or steel plate or place temporary or base pavement at the end of each work day so he can open all travel lanes to traffic. The last twenty (20) feet of each trench may be open provided that this length is covered with traffic rated plating. Steel plates shall be non-skid and shall be tacked down or spiked and placed flush with the surrounding pavement. The Contractor shall be required to place temporary AC at the edges of the steel plates.

The above requirements for backfilling or use of steel plates will be waived in cases where the trench is located further than 100 feet from any traveled roadway or occupied structure. In such cases, however, barricades and warning lights satisfactory to the Engineer shall be provided and maintained.

306-1.1.3 Maximum and Minimum Width of Trench. Add the following:

For sewers, potable and reclaimed water pipelines and storm drains, the bottom of the trench shall have a minimum width equal to the outside diameter of the pipe plus 12 inches and a maximum width equal to the outside diameter of the pipe plus 16 inches, unless otherwise shown on the Plans.

Add the following subsections:

306-1.1.7 Trench Over-Excavation. Trenches shall be over-excavated beyond the depth shown when ordered by the Engineer. Such over-excavation shall be to the depth ordered. The trench

shall be refilled to the grade of the bottom of the pipe with either selected granular material obtained from the excavation, sand or crushed rock, at the option of the Engineer. When crushed rock is ordered, the material shall be a well-graded material of 1-1/2 inch maximum size. Bedding material shall be placed in layers brought to optimum moisture content, and compacted to 95 percent of maximum density where the pipeline trench passes under structures and 90 percent elsewhere. All work specified in this subsection shall be performed by the Contractor and paid in accordance with 3-3 of these Special Provisions.

Any over-excavation carried below the specified grade and not ordered by the Engineer, specified or shown on the Plans, shall be refilled to the required grade with suitable selected granular material. Such material shall be moistened as required and compacted to 95 percent of maximum density under structures and 90 percent elsewhere. Such work shall be performed by the Contractor at its own expense.

306-1.1.8 Excavation in Lawn Areas. Where pipeline excavation occurs in lawn areas, the sod shall be carefully removed and stockpiled to preserve it for replacement. Excavated material from the trench may be placed on the lawn provided a drop cloth or other suitable method is employed to protect the lawn from damage. The lawn shall not remain covered for more than seventy-two (72) hours. Immediately after completion of backfilling and testing of the pipeline, the sod shall be replaced in a manner so as to restore the lawn as near possible to its original condition.

Except where trees are shown on the Plans to be removed, trees shall be protected from injury during construction operations. No tree roots over 2 inches in diameter shall be cut without express permission of the Engineer. Trees shall be supported during excavation as may be directed by the Engineer.

306-1.2 INSTALLATION OF PIPE

306-1.2.1 Bedding.

(A) General. Replace the second sentence of the third paragraph with the following:

There shall be 4 inches minimum of bedding below the pipe barrel of sewer and storm drain pipes and 6 inches minimum of bedding below the pipe barrel of water pipes.

Add the following to the fifth paragraph:

Bedding material for ductile iron water lines shall be sand conforming to the requirements of 200-1.5.3 (minimum SE of 70) and 200-1.5.5 and shall be compacted to 95 percent of maximum density where the trench is located under structures, and 90 percent of maximum density elsewhere.

Bedding for sewer pipes shall conform to City of Torrance Standard Plan T204-2. Bedding for storm drain pipes shall conform to City of Torrance Standard Plan No. T302-1.

306-1.2.2 Pipe Laying. Add the following:

Unless otherwise shown on the Plans or directed by the Engineer, minimum pipe cover for water pipes shall be 42 inches below proposed grade. Installation of ductile iron water mains and appurtenances shall conform to the requirements of AWWA C600. The Contractor shall install pipe closure sections, fittings, valves and appurtenances shown, including pipe supports, bolts, nuts, gaskets and joining materials necessary for a complete installation.

At all times when the work of installing water mains, reclaimed water pipelines, sewers or storm

drains is not in progress, all openings into the pipe and the ends of the pipe in the trenches or structure shall be kept tightly closed to prevent entrance of animals and foreign materials. The Contractor shall take all necessary precautions to prevent the pipe from floating due to water entering the trench from any source, shall assume full responsibility for any damage due to this cause and shall, at no cost to the CITY, restore and replace the pipe to its specified condition and grade if it is displaced due to floating. The Contractor shall maintain the inside of the pipe free from foreign materials and in a clean and sanitary condition until its acceptance by the Engineer.

Unless otherwise shown on the Plans or directed by the Engineer, concrete thrust blocks shall be constructed at all changes in direction. Thrust blocks shall be constructed against undisturbed earth. Each thrust block shall be placed so that valves and fittings are accessible for repair. Thrust blocks shall be as shown on City of Torrance Standard Plan No. T713 or as directed by the Engineer.

The Contractor shall furnish and place a blue tape, marked "Caution Water" every 36-inches or less, on top of the bedding and prior to placing concrete slurry or densified backfill along the length of the potable pipelines.

All water lines shall be installed with a two (2) feet clearance from existing utility lines. A minimum of 1-foot clearance shall be provided when crossing utility lines unless directed otherwise by the Engineer. Separation of water mains from sewer and storm drain lines shall conform to the requirements of City of Torrance Standard Plan No. T714.

All exposed piping shall be adequately supported with devices of appropriate design. Where details are shown on the Plans, the supports shall conform thereto and shall be placed as indicated; provided that the support for all piping shall be complete and adequate regardless of whether or not supporting devices are specifically called for on the Plans.

Add the following subsections:

306-1.2.14 Flexible Couplings. Flexible couplings shall be installed according to the following requirements:

1) Clean each pipe end for a distance of 6 to 8 inches. Remove oil, dirt, loose scale, and rust so that the gaskets will seat on the pipe barrel to provide a positive seal. Wire brushes or non-oily rags may be used, depending on the condition of pipe ends.

2) Slip the follower rings over the pipe ends and slide them back over the cleaned area.

3) Wipe the gaskets clean, immerse them in soapy water or approved gasket lubricant, and slide them over the pipe ends.

4) Clean the coupling middle ring, paying particular attention to flare on the ends where the gasket will seat. Slip the middle ring entirely over the end of the pipe.

5) Position the end of the pipe to be joined to the other pipe such that a 1/2-inch gap is maintained between pipes. Center the coupling middle ring over the gap.

6) Lubricate the pipe and the flares of the middle ring with soapy water or gasket lubricant. Slide the gaskets and followers into place making sure the gaskets are pushed under the middle ring flare all the way around.

7) Insert the bolts. Nuts should be run on with the rounded or chamfered edge toward the

follower ring.

8) Wrenching should be done progressively, drawing up the bolts on opposite sides a little at a time and returning to retighten until all bolts have a uniform tightness. During wrenching it is advisable to strike the follower rings with a hammer occasionally to make sure they are seating properly.

9) Torque application shall be in accordance with the manufacturer's recommendations.

306-1.2.15 Service Laterals for the Potable Water Distribution System. Installation of new service laterals for the potable water distribution system shall conform to AWWA C600 and City of Torrance Standard Plan Nos. T702, T703 and T704. In addition, new services shall conform to the following requirements:

1) Material shall be Type K soft copper.

2) No joints shall be made in service lateral runs without the Engineer's permission. All joints so allowed shall be silver-solder joints.

3) The Contractor shall cut and disconnect, at the main, all existing service laterals which are connected to the existing mains to be abandoned in place, and connect new service laterals and new meters to the new water mains, unless otherwise shown on the plans.

4) Minimum separation between service lateral connections to the main shall be 18 inches.

5) All service laterals shall be installed before new mains are pressurized and chlorinated.

6) All service laterals are to be installed, chlorinated, pressure tested and flushed before connection is made to meters.

7) Excavation pits for service laterals shall be backfilled at the end of each work day.

8) Trench resurfacing shall conform to the T-section as shown on City of Torrance Standard Plan No. T116. If borings are used instead of open trench for service laterals, one service lateral per bore shall be installed.

9) The Contractor shall replace existing water meter boxes with new meter boxes per City of Torrance Standard Plans. The existing cast iron meter box lids shall be returned by the Contractor to the CITY yard. Any meter boxes damaged by the Contractor's operation shall be immediately replaced at its expense.

306-1.2.16 Payment. Payment for installation of service laterals shall be per the Contract Unit Price and shall include connecting new meters and water mains, meter boxes, relocation and adjustment of meter boxes, repair of surrounding concrete driveway or sidewalk, abandoning existing service and appurtenant work. No payment shall be made for service laterals until the service is connected to the new main and the Contractor has delivered a list with addresses, old meter numbers and new meter numbers.

306-1.3. Backfill and Densification.

306-1.3.1 General. Delete the seventh through the eleventh paragraphs and replace with the following:

Where trench is less than or equal to two (2) feet wide in the roadway, the trench shall be backfilled with a sand-cement slurry (100-E-100) backfill per City of Torrance Standard Plan No. T116 Notes 1A and 2A, unless otherwise approved by the Engineer.

Where trench is greater than two (2) feet wide or if trench walls are sloped, the trench shall be backfilled with Crushed Miscellaneous Base or other material with a sand equivalent of 30 or greater and shall be select granular material free from organic matter per City of Torrance Standard Plan No. T116, Notes 1A and 2A. Imported backfill material shall be in accordance with 306-1.3.7. Backfill material shall be moistened to optimum moisture content and compacted to 95 percent of maximum density in the upper 3 feet and 90 percent below the upper 3 feet.

306-1.3.4 *(omitted from this specification)*

306-1.3.5 Jetted Bedding and Backfill Compaction Requirements. Replace the entire subsection with the following:

Trench bedding and backfill densified through jetting shall be densified to a minimum relative compaction of 95 percent in the upper 3 feet of backfill and 90 percent below the upper 3 feet.

306-1.3.6 Mechanical Compaction Requirements. Replace the entire subsection with the following:

Mechanically compacted trench backfill shall be densified to a minimum relative compaction of 95 percent in the upper 3 feet of backfill and 90 percent below the upper 3 feet.

Add the following subsection:

306-1.3.9 Compaction Tests. Tests to determine materials compaction shall be performed by a separate CITY-hired subcontractor, at the CITY's expense, except that all tests which fail to meet the requirements of these Special Provisions shall be paid for by the Contractor. Maximum density shall be determined in accordance with ASTM D1557 method, modified to use five layers. Field density tests shall be performed in accordance with the test procedure specified in ASTM D1556.

306-1.4 Testing Pipelines.

306-1.4.1 General. Modify subparagraph 6) as follows:

6) Water Pipelines – Testing and disinfection of potable water mains shall be in accordance with 306-1.4.7 of these Special Provisions.

Add the following subsections:

306-1.4.7 Pressure Testing of Potable Water Mains. The Contractor shall furnish all equipment, tools, labor and materials necessary for testing the piping. Equipment shall include all pipes, fittings, valves and blow-off assemblies necessary to complete the test. In case fire hydrants are not available or cannot be used for flushing purposes, blow-off assemblies and other accessories shall be furnished by the Contractor at no cost to the CITY. Water for pressure testing will be furnished by the CITY without charge to the Contractor. The Contractor shall pressure test each phase of new waterline before proceeding to the next phase.

The Contractor shall test the piping after backfilling operations are completed. Pressure testing shall be performed on no more than 1,500 lineal feet of piping at one time. The test shall be made by closing valves when available, or by placing a temporary bulkhead in the pipe and filling the

lines slowly with water. Care shall be used to see that air is permitted to escape during filling. After the line has been completely filled, it shall be allowed to stand under slight pressure for a sufficient length of time to allow the mortar lining to absorb what it will and to allow the escape of air from any air pockets, but for not less than 24 hours. During this period, bulkheads, valves, and connections shall be examined for leaks. If any are found, the leak shall be stopped, or in case of leakage through valves in the main line or through bulkheads, provision shall be made for measuring such leakage during the test. The test shall consist of holding the test pressure on each section of the line for a period of four (4) hours. The test pressure at the lowest point in the line shall be 150 psi. In areas designated as high pressure zone, the test pressure shall be 225 psi. The water necessary to maintain this pressure shall be measured through a meter or by other means satisfactory to the Engineer. The leakage shall be considered the amount of the water entering the pipeline during the test, less the measured leakage through valves and bulkheads. The leakage shall not exceed 25 gallons per inch of diameter per mile per 24 hours. Any noticeable leaks shall be repaired with new pipe or new fittings until a leakage is reduced to permissible limits.

306-1.4.8 Disinfection of Potable Water Mains. Upon completion of pressure testing, all new water mains shall be disinfected before they are placed in service. The Contractor shall furnish all equipment, tools, labor and materials necessary for disinfecting the water mains. Water for disinfection will be furnished by the City without charge to the Contractor. If a fire hydrant is not available or cannot be used for flushing purposes, blow-off assemblies and other accessories to accomplish disinfection shall be furnished by the Contractor. Disinfection shall be accomplished by chlorination in accordance with AWWA C651. All chlorinating and testing operations shall be done in the presence of the Engineer. Disinfection shall be performed on no more than 1,500 lineal feet of piping at one time. No separate cost will be paid for these items.

Disinfection shall conform to the following requirements:

1) The Contractor shall prepare and submit for approval a written disinfection plan for each section of pipe to be tested a minimum of two weeks prior to its implementation.

2) The disinfection methods and procedures shall be in accordance with AWWA C651 and approved by the Engineer.

3) The CITY will collect water samples for analysis prior to placing the new facilities in service. Should any sample fail to meet the requirements of the State Health Department, the chlorination procedures shall be repeated. The Contractor shall be responsible for any costs associated with resampling.

4) The Engineer shall be notified 72 hours in advance of any disinfection, flushing, tapping, or connections to the existing system.

5) Any new water main, hydrant, valve, service, and accessories that has a chlorine residual of more than 150 ppm, will be flushed to system residual and rechlorinated to less than 150 ppm.

6) Where connections are to be made to an existing potable water system, the point of connection shall be disinfected in accordance with AWWA C651.

7) When disposing of heavily chlorinated water, a neutralization agent shall be applied to the water to be wasted to neutralize the residual chlorine. The type and amount of neutralizing agent shall be in accordance with AWWA C651 and approved by the Engineer.

306-1.4.10 Payment. There shall be no separate payment for testing and disinfection. These costs shall be included in the Contract Unit Price per linear foot of pipe installed.

306-1.5 Trench Resurfacing.

306-1.5.1 Temporary Resurfacing. Delete the last two paragraphs and replace with the following:

For concrete slurry backfill, a minimum of 24 hours shall elapse before temporary resurfacing will be allowed to be placed on the backfill. All temporary resurfacing shall be flush to adjacent surfaces. The Contractor shall be responsible to immediately repair or replace any damaged or settled resurfacing. The temporary resurfacing shall be replaced with permanent resurfacing not more than 15 calendar days after placement of temporary resurfacing.

There shall be no separate payment for temporary resurfacing. Full compensation for furnishing, placing, maintaining, removing, and disposing temporary resurfacing materials shall be included in the Contract Unit Price per lineal foot of pipe installed.

306-1.5.2 Permanent Resurfacing. Add the following:

Pavement removed or damaged in connection with performing the Work required under the Contract shall be replaced by the Contractor in accordance with these Special Provisions and City of Torrance Standard Plans. If a strip of existing pavement less than 4 feet wide is left between a trench and a gutter or curb or edge of pavement, it shall be removed and replaced with new pavement. In most cases if the plans show a distance of 5 feet or less between the water main centerline and the curb, there will be 4 feet or less of old pavement strip that shall be removed and replaced. In cutting or breaking up street surfacing, the Contractor shall not use equipment which will damage the adjacent pavement. If the adjacent pavement is damaged, the Contractor shall be responsible for replacing the pavement with the same kind or better at its expense.

306-1.6 Basis of Payment for Open Trench Installations. Add the following as first sentence of the first paragraph:

This subsection shall apply to payment of installed potable water mains, sewer and storm drain pipes.

Revise the second paragraph to read:

The price per linear foot for pipe and conduit in place shall be considered full compensation for all wyes, tees, bends, monolithic catch basin connections, and specials shown on the Plans; the removal of interfering portions of existing sewers, storm drains, and improvements; the closing or removing of abandoned conduit and structures; the excavations of the trench; the control of ground and surface waters; the preparation of subgrade; placing and joining pipe; connecting to existing systems; beddings; backfilling the trench; permanent resurfacing; construction survey; shoring; and all other work necessary to install the pipe or conduit, complete in place.

Delete the phrase, "excluding temporary resurfacing" from the last two paragraphs.

Add the following subsections:

306-1.8 Basis of Payment for Open Trench Installations of Potable Water Mains. Payment for open trench installation of potable water mains shall be per the Contract Unit Price per linear

foot and shall include full compensation for furnishing and installing pipe, fittings, thrust blocks, removing interfering portions of existing pipes, connection to existing pipelines, shoring, bedding, backfill, compaction, temporary and permanent trench resurfacing, abandoning of existing valves, abandoning of existing water mains, replacing traffic signal detector loops, pressure testing and disinfection, construction survey and all appurtenances required for a complete system.

306-2 JACKING OPERATIONS.

306-2.1 General. Add the following:

The Contractor shall submit the following information at a minimum prior to commencing the jacking operation: jacking pit and receiving pit design, steel casing, jacking head, sequence of installation and estimated jacking operation duration including construction and backfill of jacking and receiving pits.

Utilities have been shown per available record drawings. It shall be the Contractor's responsibility to verify the exact location of all utilities and ensure the line and grade shown on the plans for the jacking operation will safely clear all existing utilities.

In the event subsurface conditions are encountered which make drilling, reaming or product installation abnormally difficult or hazardous, the Contractor shall make a reasonable effort to overcome such difficulty. Contractor shall assume the risk of loss or damage to the hole and to Contractor's equipment from the time such condition is encountered.

Before backfilling the annular space with grout, the carrier pipe shall by hydrostatically tested and disinfected per the requirements of the specifications.

It is the Contractor's responsibility for the successful completion of the jacking operation. Any requests for deviation for the project work hour requirements shall be submitted to the Engineer.

306-2.3 Jacking Steel Casing. Add the following:

Jacked steel casing shall be per City Standard Plan No. T715.

306-2.6 Payment. Replace the second paragraph with the following:

Jack and bore operations shall be paid at the Contract Unit Price for JACK AND BORE 20" STEEL CASING.

306-5 ABANDONMENT OF CONDUITS AND STRUCTURES. Add the following subsections:

306-5.1 Abandoning Existing Water Mains. Water mains specified to be abandoned in place, shall have their ends cut, plugged, capped and left intact. The abandoned water main shall not be filled with grout or removed.

306-5.2 Abandoning Existing Water Valves. The Contractor shall abandon existing water valves at the locations shown on the Plans and in accordance with the following requirements:

1) Where the valves are located in the parkway, the valves shall be abandoned by opening the valves, removing the valve cans, filling the hole with satisfactory material, and compacting it to 95% of maximum density and restore area to match adjacent.

2) Where the valves are located in concrete, the valve shall be abandoned by opening the valves, sawcutting the concrete, removing the valve cans, and filling the hole with concrete.

3) Where the valves are located in the curb, the valve shall be abandoned by opening the valves, sawcutting the concrete, removing the valve cans and repairing the curb with concrete epoxy to the satisfaction of the Engineer.

4) Where the valves are located in asphalt, the valves shall be abandoned by opening the valves, sawcutting the asphalt, removing the valve cans, filling the hole with slurry to the bottom of the asphalt section, and providing an asphalt cap on slurry.

5) All valve can removals shall be done in the presence of the Engineer.

306-5.3 Abandoning Fire Hydrants and Blow-off Valves. The Contractor shall abandon fire hydrants and blow-off valves at the locations as shown on the Plans and in accordance with the following requirements:

1) All fire hydrants to be abandoned shall be removed to the bottom of the bury and the service line capped. Abandon valves per 306-5.2 of the Special Provisions.

2) The Contractor shall deliver the removed hydrant heads to the CITY Yard.

3) The Contractor shall place a yellow bag on any out of service fire hydrant. The Contractor shall advise the Engineer to notify the City of Torrance Fire Department of the location of the fire hydrants that are out of service.

4) The Contractor shall abandon blow-off valves by sawcutting the AC, shutting off the ball valve, removing the valve box assembly, backfilling the resulting cavity with slurry to the bottom of the AC, and capping the slurry with AC. The Contractor shall also remove the blow-off assembly, backfill the cavity and restore the surface to match the surroundings.

306-5.4 Abandoning Water Services. The Contractor shall abandon water services at the locations as shown on the Plans and in accordance with the following requirements:

1) The Contractor shall cut and disconnect, at the meter boxes and at the mains, all existing service lines, which are connected to the existing water mains to be abandoned in place.

2) All existing corporation stops shall be turned off, service lines disconnected and corporation stops capped as shown on City Standard Plan No. T725.

306-5.5 Abandoning Detector Check Assembly. The Contractor shall abandon detector check assembly of the locations as shown on the Plans and in accordance with the following requirements.

1) All detector check assemblies to be abandoned shall be abandoned after installation of new detector check assembly.

2) Contractor shall remove detector check assembly according to the direction of the Engineer and deliver the removed check valve assembly to the CITY yard.

3) Contractor shall remove 4" thick concrete slab, appurtenances, abandon gate valve and service line, backfilling resulting cavities and restoring the surface to match the surroundings.

306-5.6 Payment. Payment for abandoning existing water mains and valves shall be per the Contract Unit Price and shall include all appurtenant work.

Payment for abandoning blow-off valves shall be per the Contract Unit Price and shall include any appurtenant work.

Payment for abandoning fire hydrants shall be per Contract Unit Price and shall include all appurtenant work.

Payment for abandoning detector check assembly shall be per the Contract Unit Price and shall include all appurtenant work.

There shall be no separate payment for abandoning existing water services. All costs associated with abandoning existing water services shall be considered as included in the Contract Unit Price for installation of new water services.

The following section shall apply to jacking and receiving pits for jack and bore operations.

306-8.3.5 Shafts. (The term "shaft" and "pit" are used interchangeably) Delete the first sentence of the third paragraph.

Add the following at the end of the section:

The Contractor shall utilize a California registered professional engineer to design the jacking and receiving pits. The pits shall be designed to allow a safe work area for the jacking operation. The Contractor shall submit for approval prior to commencing the pit construction: shaft dimensions, design criteria, details for ground support system such as stabilization, protection of the excavation, requirements for shaft penetrations. Allowable surcharge loads and any restrictions on surcharge capacity, including live loads, shall be clearly shown on the shaft drawings. Thrust blocks or other reactions required for jacking shall be shown if applicable. The entire submittal shall be stamped and signed by a California registered professional engineer.

Payment for the shafts shall be per the Contract Unit Price Bid for JACKING PIT and RECEIVING PIT, respectively.

SECTION 307 – STREET LIGHTING AND TRAFFIC SIGNALS

Delete the entire Section 307, and replace with Section 86 of the Caltrans Standard Specifications.

86-1 GENERAL

86-1.01 Description. Replace the entire subsection with the following:

The Work shall consist of maintaining existing and temporary electrical systems and traffic loop detectors.

86-1.06 Maintaining Existing and Temporary Electrical Systems. Add the following:

Maintenance of the existing traffic signals, street lighting, signs or approved temporary replacements shall be the responsibility of the Contractor. The Contractor shall provide twenty-four (24) hour telephone number where any intersection problem can be reported. Unless permission has been granted by the Engineer and Caltrans, the intersection must not be left on flash more than two (2) hours. Existing traffic signal system shall remain in operation during construction and until the new system is in operation.

All work to be done in connection with modification of traffic signals shall be performed in such a manner that the signals shall be in continuous operation, except for an approved duration between the hours of 9:00 AM and 3:00 PM on weekdays when a traffic signal may be turned off for necessary work. All signal indications, detectors and control equipment shall be maintained in operation except during shutdown hours as specified above. For permission to shutdown a traffic signal, Contractor shall notify the Engineer and Caltrans at least 48 hours prior to shutdown. If the traffic signal is at the intersection of two Arterial streets, the Contractor shall notify the Engineer and Caltrans at least 7 working days prior to shutdown. The placement of any temporary wiring necessary to maintain traffic signal operations shall provide a minimum of 18 feet vertical clearance for vehicles and a minimum of 10 feet over pedestrian areas. All safety regulations and precautions shall be observed in the installation work.

Replace the third paragraph with the following:

The cost for maintaining existing and temporary electrical systems shall be included in other items of work.

86-1.07 Scheduling of Work. Add the following:

The Contractor shall not begin sub-surface work until approval has been obtained from the Engineer. The Contractor shall be responsible to minimize the time between the sub-surface work and aboveground installations so as to minimize impact to the public. The Contractor's schedule for both sub-surface and aboveground work shall be based on a written estimated pole delivery date.

86-5 DETECTORS

At locations where the water installation or street improvement work will damage existing detectors in any way, they shall be replaced in accordance with the following requirements.

86-5.01 Vehicle Detectors

86-5.01A Inductive Loop Detectors.

86-5.01A(4) Construction Materials. Replace the first paragraph with the following:

Conductor for each inductive loop detector shall be continuous and unspliced and shall conform to the following:

Type 1 loop wire shall be Type RHW-USE neoprene-jacketed or Type USE cross-linked polyethylene insulated, No. 12, stranded copper wire. The minimum insulation thickness at any point shall be 40 mils.

86-5.01A (5) Installation Details. Add the following:

The Contractor shall test the detectors with a motor-driven cycle, as defined in the California Vehicle Code that is licensed for street use by the Department of Motor Vehicles of the State of California.

The unladen weight of the vehicle shall not exceed 220 pounds and the engine displacement shall not exceed 100 cubic centimeters. Special features, components or vehicles designed to activate the detector will not be permitted. The Contractor shall provide an operator who shall drive the motor-driven cycle through the response or detection area of the detector at no less than three miles per hour and no more than seven miles per hours. The detector shall provide an indication in response to this test.

Asphaltic emulsion sealant shall be used in all sawcuts.

86-8 PAYMENT

86-8.01 Payment. Replace the entire subsection with the following:

Payment for maintaining existing and temporary electrical systems and detectors shall be included in other items of work.

SECTION 310 - PAINTING

310-5 PAINTING VARIOUS SURFACES.

310-5.6 Painting Traffic Striping, Pavement Markings and Curb Markings. Delete the entire subsection 310-5.6 and replace with Sections 84-1 and 84-2 of the Caltrans Standard Specifications.

When street addresses painted on curb faces have been eliminated due to work associated with this contract, each street address shall be restored by painting on the face of new curb. Background shall be white in color and address numbers shall be black in color and 4 inches in height. Existing paint markings on curbs shall be removed prior to applying the new paint markings.

84-1.01 Description. Replace the first two paragraphs with the following:

This work shall consist of applying thermoplastic traffic stripes (traffic lines) and pavement markings at the locations and in accordance with the details shown on the Plans or designated by the Engineer, and as specified in these Specifications and Special Provisions.

The thermoplastic material shall conform to the provisions of 84-2.02 of the Caltrans Standard Specifications.

84-2.06 Payment. Replace the entire subsection with the following:

Payment for traffic striping, pavement marking, and curb markings shall be on a lump sum basis per the Contract Unit Price and shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, necessary to complete the Work.

All costs for establishing alignment of traffic stripes, pavement markings, layout, temporary pavement painting, and sandblasting of existing lines and markings shall be included and no extra costs will be allowed.

Add the following subsections:

310-5.7 Exterior Coatings for Exposed Water Pipes and Appurtenances

310-5.7.1 General. The exterior surfaces of water pipes and appurtenances that will be exposed to the atmosphere inside structure or above ground shall be thoroughly cleaned and then given a shop coat of rust-inhibitive primer conforming to 210-1.8 of these Special Provisions.

Where practicable, each succeeding coat of paint shall be of a different color. Colors as specified shall be maintained unless found to be no longer available from the manufacturer. If an alternative paint system is selected and approved by the Engineer, the Engineer will select the colors to be utilized from the color samples presented.

Each coat shall produce a minimum film thickness as specified herein. In areas where this thickness is not developed, sufficient additional coats shall be applied to produce it. All coating thicknesses specified herein refer to minimum dry film thickness.

Manufacturer's instructions shall be strictly followed in the application of proprietary coatings and materials.

310-5.7.2 Ungalvanized Ferrous Metals. Prior to coating, surfaces shall be sandblasted in accordance with SSPC-SP-6 (Commercial Blast Cleaning), except that where, in the Engineer's opinion, sandblasting is inappropriate because of the size, location or nature of the surface, or because of the difficulty in protecting adjacent work, such surfaces shall be either power tool cleaned in accordance with SSPC-SP-3 (Power Tool Cleaning) or hand tool cleaned in accordance with SSPC-SP-2 (Hand Tool Cleaning).

All paint shall be brush applied unless an alternate method is approved in advance by the Engineer. Surfaces shall be primed or spot primed as required. Prime coat shall be 2 mils. followed by two succeeding coats of 2 mils. each. Total thickness of the completed coating system shall be 6 mils.

310-5.7.3 Galvanized Ferrous Metals. Prior to coating, surfaces shall be cleaned in accordance with SSPC-SP-7 (brush-off blast cleaning).

All paint shall be brush applied unless an alternate method is approved in advance by the Engineer. Surfaces shall be primed or spot primed as required. Prime coat shall be 2 mils. followed by two succeeding coats of 2 mils. each. Total thickness of the completed coating system shall be 6 mils.

310-5.7.3 Payment. There shall be no separate payment for painting and coating. This cost shall be included in the work to which it is appurtenant.

310-5.9 Waterproofing (Concrete)

310-5.9.1 General. The Contractor shall furnish all material, labor and equipment necessary to waterproof the interior and exterior of all manholes and vaults.

310-5.9.2 Surface Preparation

1) Do not treat concrete surfaces with chemical hardeners or curing agents prior to the application of waterproofing.

2) Examine surfaces to be waterproofed for form tie holes and structural defects, such as honeycombing, rock pockets, faulty construction joints, cracks, etc. Repair these areas in accordance with Section 303.

3) Concrete surfaces shall have an open capillary system to provide tooth and suction and shall be clean, free from scale, form oil, latency, curing compounds, and any other foreign matter. Lightly sandblast, water blast, or acid etch with muriatic acid (15% to 20%) to provide a clean absorbent surface. Saturate surfaces to be acid etched with water prior to application of acid. Vertical surfaces may have a sacked finish. Do not apply a slurry coat of water materials to horizontal concrete deck surfaces that are less than 20 hours old.

4) Use light sandblasting or etching to remove the surface glaze of dense or steel troweled concrete.

5) Abrasive clean and wash construction joints.

310-5.9.3 Application

1) After completing repairs, apply a top-coat system to the concrete surfaces to be treated, apply after curing and finishes are complete. Application of waterproofing and any point top coatings shall conform to the manufacturers recommended application procedures.

2) The Contractor shall have the manufacturer's representative advise and/or supervise the waterproofing application in person.

3) Apply crystalline waterproofing material to concrete, which has been thoroughly saturated with clean water. Moisten surfaces to be treated prior to application. Remove free water prior to application of waterproofing material.

4) Apply crystalline waterproofing to:

   (a) Interior walls and roof of concrete vaults and manholes. Exterior walls of concrete vaults and manholes.
   (b) Joints of precast concrete manholes as shown on the Plans.
   (c) The interior surfaces shall have a white color and the exterior a gray color.

5) Apply second coat when the first coat has reached an initial set. Use light water spray on surfaces to be coated if rapid drying occurs.

310-5.9.4 Payment. There shall be no separate payment for waterproofing. This cost shall be included in the work to which it is appurtenant.

SECTION 312 – PAVEMENT MARKER PLACEMENT AND REMOVAL

Delete the entire Section 312 and replace with Sections 85-1.06, 85-1.07 and 85-1.09 of the Caltrans Standard Specifications.

85-1.06 Placement. Add the following:

The solid 4" white lines at intersections shall have a marker installed at each end. These markers shall be placed on the line.

Markers shall not be installed on bike lane striping.

85-1.09 Payment. There shall be no separate payment for pavement markers. Full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in furnishing and placing pavement markings, complete in place, including adhesives and establishing alignment for pavement markers, as shown on the Plans, and specified in these Special Provisions shall be included in the Contract Unit Price for TRAFFIC STRIPING, PAVEMENT MARKING AND CURB MARKING as described in Section 84-2.06 of these Special Provisions.

Add the following Section 313 in its entirety.

SECTION 313 – INSTALLATION OF MISCELLANEOUS POTABLE WATER DISTRIBUTION SYSTEM MATERIALS

313-1 CONNECTIONS TO EXISTING POTABLE WATER MAINS. Connections to the existing water mains shall be made within ten (10) working days of passing disinfection test and shall be as shown on the Plans and in accordance with City of Torrance Standard Plan No. T-723. If the Contractor fails to complete the connections within this time period, the Contractor shall be required to flush the new line weekly through a construction meter per the direction of the Engineer and pay all additional costs of water required for flushing.

In the event that a planned shut down of an existing water main is found necessary, the Contractor shall request approval four (4) days in advance from the Engineer for the time, date, duration and location of proposed shut down. Preparation and distribution of shut down notices shall be the responsibility of the Contractor. Shut down notices shall be reviewed by the Engineer and shall be in the form of a door hanger. These shut down notices shall indicate the time/date/duration/reasons for the shut down. Distribution of shut down notices shall be accomplished by placing said shut down notice on the main entry door of each dwelling unit, businesses, etc. effected by the shut down. All shut down notices shall be distributed (48 hours) 2 days in advance of the shut down.

The limits of this area for distribution of the shut down notice shall be approved by the Engineer prior to beginning the distribution process. Sample of the approved shut down notice will be available at the pre-construction meeting.

Shut down of any existing water mains may have to be performed during off-hours when the water demand is low. The Engineer shall determine the time of day when the shutdown is to be performed.

313-1.1 Payment. There shall be no separate payment for connection to the existing water main. Full compensation for furnishing labor, materials and equipment necessary to complete the connection shall be included in the Contract Unit Price per linear foot of pipe installed.

313-2 INSTALLATION OF VALVES. The size of valves to be installed shall be as shown on the Plans. All buried valves shall have the operating nuts in a vertical position except as otherwise noted. Valve boxes shall be centered over the operation nuts and shall be set plumb and conform to City of Torrance Standard Plan No. T712.

313-2.1 Payment. Payment for valves shall be per the Contract Unit Price and shall include valve boxes and related appurtenant work.

313-3 INSTALLATION OF AIR AND VACUUM RELEASE VALVES. Air and vacuum release valves shall be installed where shown on the Plans and in accordance with City of Torrance Standard Plan No. T708.

313-3.1 Payment. Payment for air and vacuum release valves shall be per the Contract Unit Price and shall include the service line, ball valve, valve box assembly, air release valve cover, concrete pad, concrete repair and related appurtenant work.

313-4 FIRE HYDRANTS. The Fire hydrant assembly shall include the hydrant extension, bury, thrust blocks, 6" service line, 6" valve, and other appurtenances as indicated in City of Torrance Standard Plan Nos. T705 and T706. Hydrant extension and bury shall be cement-mortar lined per AWWA C 104.

All fire hydrants shall be painted yellow after receiving a prime coat, as described in Section 210 of these Special Provisions.

The plan layout of proposed hydrants are diagrammatic only. Actual locations of new hydrants shall be laid out in the field in the presence of the Engineer.

When the location of a proposed fire hydrant is in conflict with the existing water main, the Contractor shall install the fire hydrant in phases and protect the existing water main in place until the new water main has been put into service.

313-4.1 Payment. Payment for fire hydrant assemblies shall be per the Contract Unit Price and shall include all related appurtenant work.

313-5 BLOW-OFF ASSEMBLIES. The Contractor shall install the blow-off assembly, including the 2-inch service line, 2-inch ball valve, and other appurtenances at the locations shown on the Plans and in accordance with City of Torrance Standard Plan No. T707.

313-5.1 Payment. Payment for blow-off assemblies shall be per the Contract Unit Price and shall include blow-off hydrants, service lines, fittings, valve box assemblies, thrust blocks and related appurtenant work.

313-6 DOUBLE CHECK DETECTOR CHECK ASSEMBLIES. Double check detector check assemblies shall be installed where shown on the Plans and in accordance with City of Torrance Standard Plan No. T710.

313-6.1 Payment. Payment for double check detector check assemblies shall be per the Contract Unit Price and shall include all related appurtenant work.

313-7 DISPLACEMENT TYPE - 3/4", 1", 1-1/2" AND 2" COLD WATER METERS. The Contractor shall install 3/4", 1", 1-1/2" and 2" water meters and meter boxes at the locations shown on the Plans and in accordance with City of Torrance Plan Nos. T703 or T704. Existing 2" meters shall be retrofitted with a new ball valve and meter box per City of Torrance Standard Plan No. T707.

313-7.1 Payment. Payment for installation of 3/4", 1", 1-1/2" and 2" water meters and meter boxes shall be per unit per the Contract Unit Price and shall include relocation, driveway repair and all related appurtenant work.

313-8 COMPOUND TYPE 3" AND 4" COLD WATER METERS. The Contractor shall install 3" and 4" water meters at the locations shown on the Plans and in accordance with City of Torrance Standard Plan No. T717.

313-8.1 Payment. Payment for installation of 3" and 4" water meter assemblies shall be per the Contract Unit Price and shall include gate valves, fittings, thrust block, support assemblies, concrete slab and other related work.

313-9 PRECAST CONCRETE MANHOLES. Installation of precast concrete manholes shall be in accordance with the manufacturer's recommendations and shall comply with all safety requirements set by state and local agencies.

313-9.1 Payment. Permit for installation of precast concrete manholes shall be per the Contract Unit Price and shall include all related appurtenant work.

SECTION 315 - SIGNAGE

Add the entire Section 315.

315.1 ROADSIDE SIGNS. All signs shall be installed in accordance with the requirements of Section 56-2.03 of the Caltrans Standard Specifications, Caltrans Standard Plans and these Special Provisions. Roadside signs shall be installed at the locations shown on the Plans or where directed by the Engineer.

All signs shown on the traffic control plans shall be new signs provided and installed by the contractor, except for existing signs specifically indicated to be relocated or to remain.

All signs shall be of 3M Diamond Grade Cubed, with 1160 protective anti-graffiti overlay film and matched components system warranty (12 years) on 0.080 Aluminum with "Torrance" and year on border.

56-2.03 CONSTRUCTION. Delete the third paragraph and last sentence of the eleventh paragraph.

Delete the entire subsection 56-2.05.

56-2.06 PAYMENT. Replace the entire subsection with the following:

There shall be no extra payment for roadside signs. Full compensation for furnishing all labor, materials, tools, equipment, and individuals, and for doing all the work involved in furnishing and installing roadside signs, complete in place, as shown on the Plans and these Special Provisions, and as directed by the Engineer shall be included in the Contract Unit Price for TRAFFIC CONTROL.

SECTION F

WEST BASIN MUNICIPAL WATER DISTRICT

SUPPLEMENTAL SPECIAL PROVISIONS FOR THE RECYCLED WATER RETROFITS FOR ANZA AVENUE MEDIANS AND PARKS

SECTION F

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SECTION 01001

SUPPLEMENTAL SPECIAL PROVISIONS

PART 1 - GENERAL

A. Responsible Agencies and Contacts

West Basin Municipal Water District (WBMWD) distributes recycled water on a wholesale basis. The local water and recycled water purveyor is City of Torrance and California Water Services Company. The water purveyor for each site is identified on the Plans. Anza Avenue medians and La Paloma, Paradise, Seaside Heroes and Victor Parks are owned and operated by the City of Torrance. The irrigation systems are connected to potable water. The purpose of this project is to convert the irrigation systems from the potable water system to recycled water.

Prior to converting the irrigation systems to recycled water and begin delivering recycled water, a successful cross-connection and coverage test will be required. The following agencies may be participating in the cross-connection and coverage test: WBMWD; City of Torrance; California Water Services Company; County of Los Angeles Department of Public Health; State of California Department of Public Health (DPH); and a representative from Tetra Tech, Inc. Contractor will be required to sequence his work to allow for the cross-connection and coverage test prior to performing the disconnection of the potable water and connection of the recycled water to the existing irrigation system. The Contractor shall be present during this test to assist as necessary during testing. The Contractor shall provide a minimum two (2) laborers in addition to the foreman to install and operate the temporary connection and assist as necessary during the testing for a period of eight (8) hours for each test.

The following is a summary of these agencies and their responsible contact information:

City of Torrance:	Mr. John Dettle (310) 618-3059
California Water Services Company:	Mr. George Cook (310) 420-8603
WBMWD Project Manager:	Mr. Frank Fuchs (310) 660-6255
County of Los Angeles Department of Public Health:	Mr. Carlos Borja (626) 430-5295
State of California Department of Health Services:	Mr. Jeff O'Keefe (213) 580-3181
Tetra Tech, Inc. Project Manager:	Mr. Mark Bush (949) 809-5000

B. Cross-Connection Testing

Prior to the beginning of construction, an initial cross-connection inspection/test will be coordinated by the City and Department of Public Health Agencies. The test will follow the general guidelines outlined in Section F of the Recycled Water Urban Irrigation User's Manual. The purpose of the test is to determine if there are any connections between the existing irrigation system and the potable water system prior to construction.

After the construction work has been completed a final cross-connection test will be performed. This on-site test is to ensure the absolute separation of the recycled and potable water systems. The City will coordinate the scheduling of the cross-connection test. The shut down test procedure is detailed in Section F of the Recycled Water Urban Irrigation User's Manual. The Contractor shall assume that the testing will take one day at each site.

The Contractor shall provide a temporary water supply from a fire service to the proposed recycled water service for the test at Victor and Paradise Parks. The Contractor to coordinate and pay for a temporary water meter from the local water purveyor. The temporary water shall be protected with an RP back flow device approved by the City. The Contractor to provide all temporary piping and appurtenances necessary for the temporary water supply.

C. Schedule Constraints

The Contractor shall notify the City in writing three (3) calendar days prior to beginning the construction activities at each site. The Contractor shall assume at least a one week time period (five (5) consecutive working days) will be required from the date of the written notification to the City that the site is ready for final cross-connection testing for the completion of the final cross-connection test.

The Contractor shall keep the existing irrigation system operational during construction to facilitate maintenance of the park. When it is necessary to de-activate the existing system or portions thereof, the Contractor shall coordinate with the City so as not to unduly hamper their maintenance work. After the Contractor's work is complete and the final acceptance of the new irrigation system is made, the Contractor shall terminate all service to the old system.

D. Construction Sequencing

A pre-construction meeting with the City and Los Angeles County Department of Public Health will be held with the Contractor prior to any construction activities to discuss the overall project, define the specific work requirements and cover any questions.

All buried piping shall be inspected by the City field representative and Los Angeles County Department of Public Health prior to being backfilled. If any recycled water, potable water, non-potable water piping is buried before field inspection, all or any portion of the piping system may be required to be exposed and corrected as necessary.

After the construction work has been completed the Contractor shall notify the City in writing so the final inspection and cross-connection test can be scheduled.

During the final cross-connection test, a punch list may be generated which the Contractor will be required to complete prior to connecting the irrigation system to the recycled water system. The City will notify the Contractor in writing of the successful completion of the final cross-connection testing.

This construction sequencing is further explained within Section G of the Recycled Water Urban Irrigation User's Manual.

E. Detailed Specifications

The material specifications for all products and the execution requirements for these products shall be per these Specifications and the Recycled Water Urban Irrigation User's Manual. If the material is not covered within the above Specifications, then the Standard Specifications for Public Works Construction ("Greenbook") shall govern.

F. Restoration of Improvements

The Contractor shall be responsible for the protection of all the trees, shrubs, irrigation systems, fences, hardscape, walkways, street and other landscape items adjacent to or within the work area, unless they are directed to do otherwise on the Plans.

In the event of damage to City improvements, the Contractor shall replace the damaged items in a manner satisfactory to the City.

All curbs, gutters, driveways, sidewalks, buildings, equipment, roadways, utilities, grounds, landscaping, irrigation and similar improvements that are broken or damaged by the Contractor's operations shall be reconstructed by the Contractor. Reconstruction shall be of the same kind of materials with the same finish and in no less than the same dimensions as the original work. Repairs shall be made by removing and replacing the entire portion between joints or scores and not merely refinishing any damaged part. All work shall match the appearance of the existing improvements as nearly as possible.

Parking lots and roads in which the surface is removed, broken, or damaged, or in which the ground has caved or settled during the work under this Contract, shall be resurfaced and brought to the original grade and section. Parking lots and roadways used by the Contractor shall be cleaned and repaired. Before resurfacing material is placed, edges of pavements shall be trimmed back far enough to provide clean, solid, vertical faces, and shall be free of loose material.

Planted areas (including grass) and hardscape areas which are damaged by actions of the Contractor shall be restored as nearly as possible to their original condition. All trees, bushes or shrubbery that are removed or cut must be replaced with similar kind and quality. All irrigation lines that are cut or damaged during the construction activities shall be repaired by approved methods to good working order at the end of each day. The Contractor shall be responsible for maintaining and cleaning up of all areas within each park of all paper, debris, etc., occurring from his construction activity. The Contractor shall resod all grass areas damaged during the construction activities. This restoration shall include placement of five (5) inches of good topsoil, along with resoding and/or replacement of the landscape items.

G. Separation Requirements

All potable water, recycled water and sewer lines shall be installed to maintain a 10-foot minimum horizontal separation between utilities. Parallel construction of recycled watermains shall maintain a minimum of four (4) feet outside diameter to outside diameter clearance as shown on WBMWD Standard Drawing RW-21. Normally, water, sewer and recycled water shall be located vertically from the finish surface in order of the higher quality, i.e., water shall be above recycled water and recycled water shall be above sewer. A minimum of 1-foot clearance vertically between the utilities should be maintained at all times. Whenever a crossing must occur where there is no alternative but to install the main with

less than the required horizontal separation or not in the higher quality, special construction will be required as shown on WBMWD Standard Drawing RW21 or as directed by the City and/or WBMWD.

H. Traffic Requirements

Pedestrian, vehicle traffic flow and pedestrian traffic through the park will be maintained at all times. If it is necessary to impact any vehicle traffic, the Contractor shall obtain approval from the City two days prior to disturbing the normal traffic flow. The Contractor shall maintain the access roads through the project site and shall keep all public roads around the park open to public traffic. The Contractor shall conduct his operations to cause the least possible obstruction to traffic and inconvenience to the public.

The Contractor shall provide traffic control for street work within Anza Avenue. Traffic control limited to one lane closure shall be in conformance with the City of Torrance Standard Drawings for Traffic Control.

If two traffic lanes are required the Contractor is required to prepare traffic control plans in conformance with the latest Watch Manual and CA MUTCD. The traffic control plans shall be prepared by a registered civil or traffic engineer licensed in the State of California. The Contractor shall submit traffic control plans to the City for approval.

The Contractor shall provide a four (4) week review time of traffic control plans.

I. Contractor's Records/As-Built Drawings

The stamped set of approved plans and specifications shall be on the jobsite at all times and in addition the Contractor shall maintain "As-Built" drawings of all work, continuously as the job progresses. A separate set of prints for this purpose shall be required and these drawings shall be up-to-date. Upon completion of the project, the Contractor shall provide the "As-Built" corrections on a copy of the plans.

J. Job Site Safety

Contractor acknowledges responsibility for jobsite safety and acknowledges that the City, WBMWD or engineer (Tetra Tech, Inc.) will not have any such responsibility.

K. Contractor's License

The Contractor shall possess a valid Class C Contractor's license or better at the time of submitting bids

L. Control Of Materials

All testing of materials to be furnished by the Contractor, testing of materials placement, and testing of manufactured materials shall be the responsibility of the Contractor and shall be done by and under the supervision and direction of a licensed California Registered Engineer or Geotechnical Engineer. This includes all compacting testing stated in Section 02223, Part 1.C.7. The District will not provide any testing services and all costs for testing shall be borne by the Contractor. The Contractor shall notify the District 24 hours prior to any planned testing. The Contractor shall submit all test results to the District. The District reserves the right at their discretion to perform their own independent testing.

M. Construction Staking

The Contractor shall be responsible for providing all construction staking required to prosecute the work of the contract. The District will not perform any construction survey staking. The construction staking shall be done under the direction and supervision of a Registered Licensed Surveyor. The Contractor shall provide the District with copies of all cut sheets. The accuracy of all the Contractor's stakes, alignments and grades is the responsibility of the Contractor. However, the District has the discretionary right to check the Contractor's stakes, alignments, and grades at any time. Where such discretion is to be exercised by the District, the District will notify the Contractor of their intention, stating the time at which the checking will commence. Any part of the work in progress, the results of which are predicated directly upon the Contractor's stakes, alignments, or grades to be checked, shall be held in abeyance until the District has notified the Contractor that the checking has been completed.

N. Drawings and Verification of Dimensions

All plot plan dimensions are approximate, and shall be checked and verified by the Contractor before proceeding with work. The Contractor shall report all variations from those indicated in the plot plan to the Owner or the Owner's Representative and the Designer.

For clarity and legibility, pipelines and electrical lines are diagrammatic. The sizes and location of equipment are drawn to scale wherever possible.

O. Shop Drawing Submittals

Shop drawings shall be submitted in accordance with Specification Section 01300 – Contractor Submittals.

The Contractor shall include as part of their bid the costs associated with the preparation of Shop Drawings for the following critical scheduling items:

1. DIP, CL350
2. PVC CL315 Pipe
3. Transition Couplings
4. RPPD
5. Protective Enclosures
6. Recycled Water Identification Signs
7. Potable/Non-Potable/Recycled Water Identification Tags and Labels
8. RW Quick Coupler
9. Brass Pipe
10. Bronze Valves
11. Copper Pipe
12. Pressure Reducing Valve
13. Concrete Mix
14. Sand Bedding
15. Asphalt Paving
16. Aggregate Base
17. Resilient Wedge Gate Valves
18. Valve Box

P. Lead Free Plumbing (For Potable Water Only)

In September 2006, the State Legislature passed Assembly Bill 1953 prohibiting the use of any pipe, pipe or plumbing fitting or fixture, solder or flux that is not lead free in the

installation or repair of any fixture intended to convey or dispense water for human consumption. The prohibition has been in effect since January 1, 2010.

All potable water facilities shall be provided with materials that meet the lead free requirements as defined in AB 1953, and certified by an independent American National Standards Institute (ANSI) accredited third party, including but not limited to, NSF International, as being in compliance with section 116875 (g) of the Health and Safety Code as amended by AB 1953. Each shipment shall contain a copy of the certification that the item is lead free as defined by AB 1953.

Q. Asbestos Materials

It is the specific intent of these Contract Documents to exclude from the work any and all products or materials containing asbestos. No products containing asbestos shall be incorporated in the work.

Water lines constructed of asbestos cement pipe are known to exist in the area and have been identified on the plans based on the best utility information available. If asbestos materials are encountered during any work, the Contractor shall promptly notify the District in writing. Removal of existing asbestos material shall be performed by a Contractor registered by CAL/OSHA and certified by the State Contractors Licensing Board for asbestos removal. Copies of the certification shall be submitted to the District prior to the commencement of any asbestos removal activities. The Contractor or subcontractor shall comply with all State and Federal laws regarding handling and removal of asbestos materials. Removal of asbestos materials from the project site and disposal at an authorized disposal facility will be the responsibility of the Contractor and all costs for this will be borne by the Contractor.

In the specific instance of making piping connections to existing asbestos cement pipe, the Contractor shall disconnect, at the nearest joints, the length of asbestos cement pipe to be connected into. This length of existing asbestos cement pipe will be replaced by the new pipe making the tie-in.

R. New Potable Water Service and Recycled Water Service

The City of Torrance will request and obtain new potable water service and or new recycled water service. The Contractor shall notify the City in writing three (3) weeks in advance when these services are required.

PART 2 - PRODUCTS
(Not Used)

PART 3 - EXECUTION
(Not Used)

END OF SECTION

SECTION 01045

EXISTING FACILITIES

PART 1 - GENERAL

A. Description

This section includes requirements for connection to existing City facilities.

B. Related Work Specified Elsewhere

All related work specified elsewhere, or in other codes or standards, will be as last revised, unless a specific date of issuance is called out in opposition to later revision date(s).

Other sections of the technical specifications, not referenced below, shall also apply to the extent required for proper performance of this work.

1. Trenching, Backfilling, and Compacting: 02223

2. Hydrostatic Testing of Pressure Pipelines: 15042

3. Manual Valves: 15100

C. Condition of Existing Facilities

The City does not warranty the condition, size, material, and location of existing facilities. The contractor shall be responsible for verifying the properties of the existing pipe that will be connected to the proposed piping.

D. Location

The contractor shall be responsible for potholing and verifying in advance the location of all existing pipelines as shown on the plans.

E. Protection of Existing Utilities and Facilities

1. The contractor shall be responsible for the care and protection of all existing sewer pipe, water pipe, gas mains, culverts, power or communications lines, sidewalks, curbs, pavement, or other facilities and structures that may be encountered in or near the area of the work.

2. It shall be the duty of the contractor to notify Underground Service Alert and each agency of jurisdiction and make arrangements for locating their facilities prior to beginning construction.

3. The Contractor shall submit a plan as to the method the Contractor will use to protect and support any utilities which will become exposed during excavation or that which are vulnerable to failure due to unsupported trenches or other construction activity.

4. In the event of damage to any existing facilities during the progress of the work and of the failure of the contractor to exercise the proper precautions, the contractor will pay for the cost of all repairs and protection to said facilities. The contractor's work may be stopped until repair operations are complete.

F. Protection of Landscaping

1. The contractor shall be responsible for the protection of all the trees, shrubs, irrigation systems, fences, and other landscape items adjacent to or within the work area, unless they are directed to do otherwise on the plans.

2. In the event of damage to landscape items, the contractor shall replace the damaged items in a manner satisfactory to the City representative and the owner, or pay damages to the owner as directed by the City.

3. When the proposed pipeline and/or vault is to be within planted or other improved areas in public or private easements, the contractor shall restore such areas to the original condition after completion of the work. This restoration shall include grading, a placement of 5 inches of good topsoil, resoding, and replacement of all landscape items indicated.

4. If the contractor does not proceed with the restoration after completion of the work or does not complete the restoration in a satisfactory manner, the City reserve the right to have the work done and to charge the contractor for the actual cost of the restoration including all labor, material, and overhead required for restoration.

G. Permits

All work shall conform to the specifications and requirements of the jurisdictional agency. The contractor shall keep a copy of all the required permits in the job site and comply with all the terms and conditions of said permits.

PART 2 - MATERIALS

All materials used in making the connection or removing the facility from service shall conform to the applicable sections of these specifications.

A. Grout

Grout shall consist of Portland cement and water or of Portland cement, sand, and water; and all grout mixtures shall contain 2% of bentonite by weight of the cement. Grout shall be a pump mix with a minimum of six sacks cement (564 lbs) per cubic yard.

Portland cement, water and sand shall conform to the applicable requirements of the concrete section (Section 03300), except that sand to be used shall be of such fineness that 100% will pass a standard 8-mesh sieve and at least 45%, by weight, will pass a standard 40-mesh sieve.

B. Concrete

Concrete used for the replacement of damaged or removed facilities shall be in accordance with Section 03300 and shall match the mix design of the existing facility and per the requirement of the jurisdictional agency.

PART 3 - EXECUTION

A. Connection to Existing Facilities

1. All connections shall be made by the contractor unless shown otherwise on the plans or specified herein.

2. The contractor shall notify the City a minimum of two working days before the time of any proposed shutdown of existing mains or services. The City inspector may postpone or reschedule any shutdown operation if for any reason he feels that the contractor is improperly prepared with competent personnel, equipment, or materials to proceed with the connection work.

3. Connections shall be made only in the presence of the City, and no connection work shall proceed until the City has given notice to proceed. If progress is inadequate during the connection operations to complete the connection in the time specified, the City shall order necessary corrective measures. All costs for corrective measures shall be paid by the contractor.

4. The contractor shall furnish all pipe and materials including furnishing all labor and equipment necessary to make the connections, all required excavation, backfill, pavement replacement, lights, and barricades, and may be required to include a water truck, high line hose, and fittings as part of this equipment for making the connections. In addition, the contractor shall assist the City in alleviating any hardship incurred during the shutdown for connections. Standby equipment or materials may be required by the City representative.

5. The contractor will de-water existing mains, as required, in the presence of the City representative. The dewatering shall be discharged to a sewer system. The Contractor shall notify the City of dewatering activities two working days prior to commencing the activity.

6. Connections shall be made with as little change as possible in the grade of the new main. If the grade of the existing pipe is below that of the new pipeline, a sufficient length of the new line shall be deepened so as to prevent the creation of any high spot or abrupt changes in grade of the new line. Where the grade of the existing pipe is above that of the new pipeline, the new line shall be laid at specified depth, except for the first joint adjacent to the connection, which shall be deflected as necessary to meet the grade of the existing pipe. If sufficient change in direction cannot be obtained by the limited deflection of the first joint, a fitting of the proper angle shall be installed. Where the connection creates a high or low spot in the line, a standard air release or blow off assemble shall be installed as directed by the City representative.

7. New pipelines shall not be connected to existing facilities until the new pipelines have been successfully tested, disinfected and accepted by the City.

8. Tapping connection can be made to the existing system while it is either in service or shut down depending on the City's prior direction. A tapping valve shall be used when the existing system is maintained in service during connection. Tapping shall be in accordance with the specification requirements for the pipe being tapped.

B. Abandonment of Existing Water Service

1. The Contractor shall notify the City a minimum of two working days before any proposed abandonment of existing service.

2. The Contractor shall excavate and expose the service tap at the main and close the existing corp stop. Install a bronze cap at the corp stop and crimp closed the service lateral at the main and meter box. Backfill within the street shall be one sack slurry.

3. The Contractor shall remove the existing water meter and deliver the meter to the City Yard. Remove and dispose the existing water meter box and crimp close service at both ends of meter. Backfill void with native and compact to 85% relative compaction and restore landscaping to original condition.

4. If the existing meter box is within the concrete side walk, the Contractor shall remove and replace the concrete sidewalk to the nearest construction joint per City Standard Drawing T102-2.

C. Cutting and Restoring Street Surfacing

1. In cutting or breaking up street surfacing, the Contractor shall not use equipment that will damage adjacent pavement.

2. All asphalt and/or portland cement concrete surfaces shall be scored with sawing equipment of a type meeting the approval of the City; providing however, that any cement concrete base under an asphaltic mix surface will not be required to be scored by sawing. Existing paving surfaces shall be saw cut back beyond the edges of the trenches to form neat square cuts before repaving is commenced.

3. Pavement, sidewalks, curbs, or gutters removed or destroyed in connection with performance of the work shall be saw cut to the nearest score marks, if any, and shall be replaced with pavement sidewalks, curbs, or gutters of the same kind, or better by the contractor in accordance with the latest specifications, rules, and regulations and subject to the inspection of the agency having jurisdiction over the street or highway.

4. Aggregate base shall be placed beneath the restored pavement to the thickness required by the agency having jurisdiction.

END OF SECTION

SECTION 09900

PAINTING AND COATING

PART 1 - GENERAL

A. Description

This section includes the materials and application of painting and coating systems for buried and exposed surfaces.

All articles to be painted or coated will be painted or coated in the place of manufacture, unless field painting and coating is absolutely necessary. The City representative will make the determination. In the event that the paint or coating is damaged in the field, it will be touched up in the same manner as the original paint or coating applied in the place of manufacture.

B. Related Work Described Elsewhere

All related work specified elsewhere, or in other codes or standards, will be as last revised, unless a specific date of issuance is called out in opposition to later revision date(s).

Other sections of the technical specifications, not referenced below, shall also apply to the extent required for proper performance of this work.

1. Ductile-Iron Pipe and Fittings: 15056

2. Manual Valves: 15100

3. Domestic and Recycled Water Facilities Identification: 15151

C. Approved Manufacturers

1. Organic Zinc Primer
   Koppers
   Tnemec 90-93
   Rust-Oleum

2. Alkyd Enamel
   Koppers Glamortex 501
   Dunn-Edwards Syn-Lustro
   Rust-Oleum Industrial Enamel
   Tnemec Endura Shield IV

3. Epoxy Paint
   a. Field Applied
      Koppers 200
      Tnemec Series 66 Epoxoline
      Rust-Olem 9100 High Performance Epoxy

b. Factory Applied
Keysite 750
Tnemec Series 140 NSF 61

c. Factory Applied
Fusion Bonded Epoxy
3M Scotchkote 134 NSF 61

4. Bituminous Mastic
Minnesota Mining and Manufacturing EC 244
Koppers Bitumastic (Supertank) 505

D. Paint Schedule

It is desired that aboveground or exposed facilities be color coded depending if they are recycled water facilities, domestic water or wastewater facilities. Unless otherwise noted, the color for surfaces that are to be coated shall be selected by the City.

1. Recycled Water System

a. Piping and Equipment: Purple (Pantone 512)

2. Potable Water System

a. Piping and Equipment: Edison Blue (Sinclair No. 75-30)

The Contractor shall submit color samples for approval by the City.

E. Permits

All work shall conform to the specifications and requirements of the jurisdictional agencies involved. The contractor shall keep a copy of all the required permits in the job site and comply with all the terms and conditions of said permits.

PART 2 - MATERIALS

A. Primer

1. All primer shall be synthetic-alkyd based.

2. All primer shall contain not less than 73% solids by volume and not less than 54% pigment by weight.

3. All primer shall contain not less than 43% zinc chromate pigment and 14% red iron oxide pigment by weight.

B. Alkyd Enamel

1. All enamels shall be synthetic-alkyd based.

2. All enamels shall be lead-free.

3. All enamels shall be high gloss industrial type intended for use on exterior metal surfaces.

4. All enamels shall contain not less than 60% solids by volume and not less than 30% pigment by weight.

C. Bituminous Mastic

1. Bituminous mastic shall be coal-tar pitch based.

2. Bituminous mastic shall have a minimum of 68% solids by volume.

D. Epoxy Paint

1. Epoxy shall be a colored polyamide cured epoxy with not less than 49% solids by volume.

2. All coatings and pigments to be used on domestic water services shall have FDA approval for use with domestic water.

PART 3 - EXECUTION

A. Surface Preparation

1. Do not sandblast or prepare more surface area than can be coated in one day. Remove all sharp edges, burrs, and weld spatter. Do not sandblast epoxy-coated pipe that has already been factory coated.

2. Surface preparation shall conform with the SSPC specifications as described below:

Solvent Cleaning	SP-1
Hand Tool Cleaning	SP-2
Power Tool Cleaning	SP-3
White Metal Blast Cleaning	SP-5
Commercial Blast Cleaning	SP-6
Brush-Off Blast Cleaning	SP-7
Pickling	SP-8
Near-White Blast Cleaning	SP-10

3. Wherever the words "solvent cleaning," "hand tool cleaning," "wire brushing," or "blast cleaning" or similar words are used in these specifications or in paint manufacturer's specifications, they shall be understood to refer to the applicable

SSPC (Steel Structure Painting Council, Surface Preparation Specifications, ANSI A159.1) specifications listed above.

B. Painting Systems

1. All materials of a specified painting system, including primer, intermediate; and finish coats, shall be produced by the same manufacturer. Thinners, cleaners, driers, and other additives shall be as recommended by the paint manufacturer for the particular coating system.

2. Deliver all paints to the job site in the original, unopened containers.

C. Surfaces Not To Be Coated

The following surfaces shall not be painted and shall be protected during the painting of adjacent areas:

1. Mortar-coated pipe and fittings
2. Stainless steel
3. Metal letters
4. Nameplates
5. Grease fittings
6. Brass and copper, submerged
7. Buried pipe, unless specifically required in the piping specifications
8. Bronze meters and strainers

D. Protection of Surfaces Not To Be Painted

Remove, mask, or otherwise protect hardware, lighting fixtures, switch plates, aluminum surfaces, machined surfaces, couplings, shafts, bearings, nameplates on machinery, and other surfaces not intended to be painted. Provide drop cloths to prevent paint materials from falling on or marring adjacent surfaces. Protect working parts of mechanical and electrical equipment from damage during surface preparation and painting process. Mask openings in motors to prevent paint and other materials from entering the motors.

E. Field Touch Up of Manufacturer-Applied Prime Coats

Surfaces that are primed at the place of manufacture shall receive a field touch-up of organic zinc primer to cover all scratches or abraded areas.

F. Alkyd Enamel

1. The following items shall be painted using an alkyd enamel system:

   a. All aboveground or exposed piping and all piping in vaults
   b. Fire hydrants
   c. Valve box lids
   d. Air release valves
   e. Meter box reading lids for all recycled water services
   f. Steel meter vault covers for all services 3 inches and larger
   g. All exposed metalwork as directed by the City representative

2. Surface Preparation:

   a. All rust, mill scale, or weld splatter shall be removed by sandblasting or power tool cleaning.
   b. All unpainted surfaces shall be solvent cleaned in accordance with SP-1.

   c. All abraded or scratched enamel coatings shall be sanded smooth or receive power tool cleaning per SP-3.

   d. All failures in the existing coating shall be sandblasted in accordance with SP-6.

   e. All existing surfaces to be repainted shall be washed with TSP, or other cleanser suitable for removing grease, dust or other residue, and a stiff bristle brush.

3. All unpainted or damaged surfaces shall be coated with primer to a dry-film thickness of not less than 2 mils.

4. The finish coats shall be two or more coats of alkyd enamel applied to a dry-film thickness of 3 mils, providing a total painted dry film thickness of not less than 5 mils.

G. Bituminous Mastic

1. Buried metal (flanges, non-stainless steel nuts and bolts, flexible couplings, exposed reinforcing steel, etc.) shall be coated with a minimum of 20 mils of bituminous mastic.

2. All surfaces coated with bituminous mastic shall be covered with 8 mil polyethylene wrap per Section 15056.

H. Epoxy Coating

1. Only those metal surfaces specifically called out shall be epoxy coated.

2. Epoxy lining and coating of valves shall be per AWWA C550 and Section 15100 Manual Valves. All valves shall be lined and coated by manufacturer.

3. Surfaces to be epoxy coated shall be sandblasted to SP-6 requirements.

4. Sandblasted surfaces shall be coated with organic zinc primer to a dry film thickness of 3 mils.

5. Apply two coats of epoxy paint (4 mils each) to the primed surface. The manufacturer's recommended drying time between coats shall be followed.

6. Prepare multiple-component coatings using all of the contents of the container for each component as packaged by the paint manufacturer. Do not use partial batches. Do not use multiple-component coatings that have been mixed beyond their pot life. Provide small quantity kits for touch up painting and for painting other small areas. Mix only the components specified and furnished by the paint

manufacturer. Do not intermix additional components for reasons of color or otherwise, even within the same generic type of coating.

H. Dry-Film Thickness Testing

1. Measure coating thickness specified for metal surfaces with a majestic-type dry-film thickness gage. Test the finish coat (except zinc primer and galvanizing) for holidays and discontinuities with an electrical holiday detector, low-voltage, wet-sponge type. Measuring equipment shall be provided by the contractor. Provide detector as manufactured by Tinker and Rasor or K-D Bird Dog. Provide dry-film thickness gage as manufactured by Mikrotest or Elcometer. Check each coat for the correct dry-film thickness. Do not measure within eight hours after application of the coating.

2. If the item has an improper finish color or insufficient film thickness, the surface shall be cleaned and topcoated with the specified paint material to obtain the specified color and coverage. Visible areas of chipped, peeled, or abraded paint shall then be primed and finish coated in accordance with the specifications. Work shall be free of runs, bridges, shiners, laps, or other imperfections.

END OF SECTION

SECTION 15000

PIPING SCHEDULE AND GENERAL PIPING REQUIREMENTS

PART 1 - GENERAL

A. Description

This section describes the general requirements for selecting piping materials; general piping specifications; backfill requirements; and requirements for miscellaneous piping appurtenances, including bolts, nuts and gaskets.

B. Related Work Specified Elsewhere

Supplemental Special Provisions: 01001.

C. Submittals

Submit shop drawings on the following items, as a minimum: piping, fittings, strainers, valves, gauges, and enclosures.

D. Definitions of Buried and Exposed Piping

1. Buried piping is piping buried in the soil, or encased in concrete, commencing at the inside face of the wall or top of the slab of a structure. Where a coating is specified, and pipe enters or leaves the ground, extend the coating a minimum of 6-inches above the ground surface. Where a coating is specified, extend the coating up to three inches inside of the structure.

2. Exposed piping is piping in any of the following conditions or locations:

   a. above ground;
   b. inside vaults, or other structures;

E. Default Piping Materials

If no material is shown in the drawings, use the following piping materials:

Service	Size Range (inches)	Water System PW/RW/IRRIG	Material
Buried	2" and smaller	PW	Copper
	4"	PW	AWWA C-900 PVC
	2" and smaller	RW	Copper
	3"	RW	DIP
	4"	RW	AWWA C-900 PVC

Service	Size Range (inches)	Water System PW/RW/IRRIG	Material
Buried	2" and smaller	IRRIG	PVC Sch. 80
	2-1/2" and larger	IRRIG	PVC Sch. 80
Exposed	2" and smaller	PW	Copper
	3" and larger	PW	DIP
	2" and smaller	RW	Copper
	3" and larger	RW	DIP
	2" and smaller	IRRIG	Brass
	2-1/2"	IRRIG	Brass
	3" and larger	IRRIG	DIP

PART 2 - MATERIALS

A. Pipe Material Selection

The acceptable piping materials for the pipelines are shown on the Construction Plans or use the above default materials.

B. Ductile Iron Pipe

All ductile iron pipe shall be in accordance with Section 207-9.2 of WBMWD Standard Specifications for Pipeline Construction. All DIP buried underground shall be protected with polyethylene encasement as specified in Section 207-9.2.6 of WBMWD Standard Specifications for Pipeline Construction. Also, recycled water DIP buried underground may be encased with purple colored polyethylene encasement as stated in 207-9.2.7 of WBMWD Standard Specifications for Pipeline Construction.

C. PVC Pipe: 4-inches in diameter

PVC Pipe 4-inches in diameter and larger shall be in accordance with Section 207-25 of WBMWD Standard Specifications for Pipeline Construction. Tracer wire will not be required for the PVC pipelines.

D. PVC Pipe: 1-inch Through 3-inch in diameter

PVC Pipe 1-inch through 3-inces in diameter shall be in accordance with Section 207-25.7 of WBMWD Standard Specifications for Pipeline Construction. Tracer wire will not be required for the PVC pipelines. All irrigation pipe and fittings shall conform to Section 212-2.1 of the Standard Specification for Public Works Construction unless modified herein. Pressure main line piping (3-inches and larger or where called for on the plan) shall be PVC 315. Fittings shall be Schedule 80. Non-pressure lateral piping (2-inches and smaller) shall be PVC Class 200. Fittings shall be Schedule 40.

E. Resilient-Wedge Gate Valves

Resilient-wedge gate valves shall be in accordance with Section 207-26.2.3 of WBMWD Standard Specifications for Pipeline Construction. Valve painting and coating shall be in accordance with Section 207-26.2.7 of WBMWD Standard Specifications for Pipeline Construction.

F. Flanges

Flanges shall be in accordance with Section 207-26.3.2 of WBMWD Standard Specifications for Pipeline Construction.

G. Copper Pipe and Fittings

Copper pipe and fittings shall be in accordance with Section 207-26.4 of WBMWD Standard Specifications for Pipeline Construction.

H. Brass Pipe, Nipples and Fittings

Brass pipe, nipples and fittings shall be in accordance with Section 207-26.5 of WBMWD Standard Specifications for Pipeline Construction.

I. Bronze Appurtenances

Bronze appurtenances shall be in accordance with Section 207-26.6 of WBMWD Standard Specifications for Pipeline Construction.

J. Painting and Protective Coatings

Painting and protective coatings shall be in accordance with Section 210 of WBMWD Standard Specifications for Pipeline Construction.

K. Concrete

Concrete shall be 560-C-3250 unless otherwise specified and shall be in accordance with Standard Specifications for Public Works Construction.

L. Bedding and Backfill Material

Pipe bedding and backfill material shall be per WBMWD Standard Drawing RW17 and shall be per the Standard Specifications for Public Works Construction, except where modified by the plans and permit requirements.

M. Enclosures

Enclosures shall be of rugged construction that will prevent vandalism and theft of the above ground piping, valves and appurtenances. The enclosures shall have no sharp corners. The enclosures shall be powder-coated metal for lasting durability and lower maintenance costs.

Standard color shall be High Gloss Forest Green. The City shall approve of the color prior to ordering the enclosure.

Enclosures shall be Powdercoated Enclosures, GuardShack manufactured by BPDI or approved equal. Enclosures shall be provided with LockShield brackets for maximum protection form bolt cutters. The enclosures shall be furnished with complete hardware kit needed to secure unit to concrete base.

N. Strainers

2-inch strainer shall be constructed of bronze and shall have a NPT blow-off connection. Strainer shall be provided with 40 mesh stainless steel screen. Strainer shall be provided with a 1-inch bronze plug.

3-inch strainer shall be constructed of cast iron and shall have a NPT blow-off outlet. Strainer shall be provided with a perforated 304 stainless steel screen (1/16" perforations). The body and cover shall be fusion epoxy coated per AWWA C550. Strainer shall be provided with a 1-inch cast iron plug.

O. Backflow Preventers

All backflow prevention assemblies shall be listed in the latest edition of the "List of Approved Backflow Prevention Assemblies" Foundation for Cross-Connection Control and Hydraulic Research, University of Southern California, School of Engineering.

Upon completion of the installation of the device, a test shall be performed and a certificate of the adequacy and operational compliance shall be furnished to the City and WBMWD. The tests shall be performed by a testing agency approved by the County of Los Angeles Department of Health Services.

P. Pressure Reducing Valves

The pressure reducing valves shall be a hydraulically-controlled diaphragm actuated valve. The main valve body and cover shall be made of ductile iron, ASTM A 536. The main valve trim and seat shall be Type 303 stainless steel, ASTM A 276 or A 351. The pilot control system shall be cast bronze, ASTM B 62, with Type 303 stainless steel trim. Piping and tubing shall be copper and brass or stainless steel. Elastomers shall be EPDM rubber material. The interior surfaces of the valve shall be epoxy coated. Valves shall be coated the same as the adjacent piping.

Pressure reducing valves shall automatically maintain a constant downstream pressure regardless of changing flow rates and/or varying inlet pressures. The pilot control shall be direct-acting, spring loaded, diaphragm valve, designed to permit flow when controlled pressure is less than the spring setting.
The pilot control system shall be provided with a strainer, isolation valves, opening speed control, and closing speed control.

The valve shall be Cla-Val 90-01, Ames ACV 910 Series "Mustang Valve", Singer Model 106-PR or approved equal.

Q. Bolts and Nuts

Bolts, nuts and washers for buried flanges and for above ground applications shall be Type 316 stainless steel. Provide one (1) washer for each bolt. The length of each bolt or stud shall be such that between ¼ inch and 3/8 inch will project through the nut when drawn tight. Lubricant for stainless steel nuts and bolts shall be TRX-Synlub by Ramco, Anti-Seize by Ramco, Husk-It Husky Lube O'Seal, or equal.

PART 3 - EXECUTION

A. Trenching, Backfilling and Compaction

Trenching, backfilling and compaction shall be per Standard Specifications for Public Works Construction, except where modified by the plans and permit requirements.

B. Pipe Installation

Pipe installation shall be per WBMWD Standard Specifications for Pipeline Construction. If not specified therein, the pipe installation shall be per the Standard Specifications for Public Works Construction.

END OF SECTION

SECTION 15057

COPPER, BRASS, AND BRONZE PIPE FITTINGS AND APPURTENANCES

PART 1 - GENERAL

A. Description

This section includes materials and installation of copper, brass, and bronze pipe, fittings and appurtenances.

B. Approved Manufacturers

1. All materials shall be the appropriate model number specified on WBMWD standard drawings as manufactured by the companies listed herein.

2. Copper Tubing
   - Anaconda
   - Phelps – Dodge
   - Revere

3. Service Saddle
   - Jones
   - Mueller

4. Corporation Stop
   - Jones
   - Mueller
   - Ford
   - A.Y. McDonald

5. Angle Meter Stop
   - Jones
   - Mueller
   - Ford
   - A. Y. McDonald

6. Customer Valve
   - Jones
   - Ford
   - A.Y. McDonald

7. Insulating Pipe Bushings, Unions, or Couplings
   - Pipeline Coating and Engineering Co.
   - 1566 East Slauson Avenue, Los Angeles
   - Smith Blair
   - Pipe Seal and Insulator Company

PART 2 - MATERIALS

A. Copper

1. Copper tubing shall conform to the requirements of ASTM B 88 for seamless copper water tube. Piping located aboveground or suspended within vaults shall be Type L. Buried piping shall be Type K. Copper pipe shall be of domestic manufacture.

2. Fittings shall be copper conforming to ASTM B 75 and ANSI B16.22, with solder end joints. Fittings 3/8 inch and smaller may have flared end connections or compression joint connections.

3. Solder shall be silver solder conforming to ASTM B 32, Grade 95TA. Do not use cored solder.

4. All copper lines shall be encased within a 8-mil polyethylene sleeve. Sleeves shall be color coded per Section 15151.

B. Brass Pipe, Nipples, and Fittings

Short threaded nipples, brass pipe and fittings shall conform to ASTM B 43, regular wall thickness, except that nipples and pipe of sizes 1-inch and smaller shall be extra strong. Threads shall conform to ANSI B2.1.

C. Bronze Appurtenances

1. All items specified herein shall be manufactured of bronze conforming to ASTM B 62, "Composition Brass or Ounce Metal Castings."

2. All size service saddles shall be of the double-strap type for any type of pipe. The straps (or bails) shall be flat and shall be manufactured of silnic bronze for ACP and of stainless steel for C900 PVC and ductile iron pipe. The body shall be manufactured of bronze and shall be tapped for an iron pipe thread. The seal with the pipe shall be effected with either a rubber gasket or an O-ring.

3. Corporation stops shall be, ball valve type and shall be manufactured of bronze. The inlet fitting shall be a male iron pipe thread when used with saddle and the outlet connection shall be a flare type.

4. Angle meter stops shall be ball valve type for ¾-inch and 1-inch services and ground inverted key type for 1-1/2-inch and 2-inch services and shall be manufactured of bronze. The inlet connection shall be a flare type or female iron-pipe thread and the outlet fitting shall be a meter flange or meter coupling. The inlet and outlet shall form an angle of 90 degrees on a vertical plane through the centerline of the meter stop. A rectangular lug and lock wing shall be provided on the top of the fitting to operate the shutoff mechanism.

5. Customer service valves shall be manufactured of bronze, ball valve type, with lever-type turn handle. The inlet connection shall be a meter flange or a meter coupling and the outlet female iron pipe.

D. Flanges, Gaskets, Bolts, and Nuts

1. Connect to flanged valves and fittings with bronze flanges conforming to ANSI B16.24, Class 125 or Class 150, to match the connecting flange. Use solder end companion flanges.

2. Gaskets for flanged-end fittings shall be made of synthetic rubber binder and shall be fullface, 1/8-inch-thick John-Manville 60, John Crane Co. "Cranite," or equal.

3. When both adjoining flanges are bronze, use bronze bolts and nuts. Bolts shall conform to ASTM F 468, Grade C65100 or C63000. Nuts shall conform to ASTM F 467, Grade C65100 or C63000.

4. When only one of the adjoining flanges is bronze, use type 316 stainless-steel bolts and nuts conforming to ASTM A 193, Grade B8M for bolts, and ASTM A 194, Grade 8M for nuts.

5. Connect to buried ferrous flanges with flange insulation kits. Bolts used in flange insulation kits shall conform to ASTM B 193, Grade B7. Nuts shall comply with ASTM A 194, Grade 2H. If the adjoining buried flange is bronze, use bronze bolts and nuts as described above, without a flange insulation kit.

6. Provide one (1) washer for each nut. Each washer shall be of the same material as the nut.

PART 3 - EXECUTION

A. Copper Tubing and Fittings

1. Cut tubing square and remove burrs. Clean both the inside and outside of fitting and pipe ends with steel wool and muriatic acid before soldering. Prevent annealing of fittings and tubing when making connections. Do not miter joints for elbows or notch straight runs of pipe for tees.

2. Bends in soft copper tubing shall be long sweep. Shape bends with shaping tools. Form bends without flattening, buckling, or thinning the tubing wall at any point.

3. Brazing procedures shall be in accordance with Articles XII and XIII, Section IX, of the ASME Boiler and Pressure Vessel Code. Silver solder shall be used. Solder shall penetrate to the full depth of the cup in joints and fittings. Solderers shall comply with ANSI B31.3, paragraph 328.

4. Buried piping shall be installed with some slack to provide flexibility in the event of a load due to settlement, expansion or contraction. A MINIMUM COVER OF 36 INCHES BELOW THE FINISHED STREET GRADE SHALL BE ADHERED TO. The tubing is to be bedded and covered with sand or select material as determined by the City representative.

5. All domestic service laterals shall be 3/4-inch minimum size copper tubing. End connections shall be flare type.

6. All 2-inch size services shall be installed with straight lengths of soft copper water tube Type K. Flare fittings are acceptable on only the corporation stop and angle meter stop. All couplings and adapters shall be silver soldered.

7. The service line shall extend perpendicular to the centerline of the street from the water main to the meter stop or structure, except in a cul-de-sac, where the service shall run in a straight line from the water main to the meter stop.

8. The service line shall be placed within an 8-mil polyethylene sleeve, color-coded for the type of service. The ends and splices in the sleeve shall be sealed with 20-mil tape.

B. Service Saddle

1. The service saddle shall be no closer than 18 inches to a valve, coupling, joint, or fitting.

2. The surface of the pipe shall be filed to remove all loose material and to provide a hard, clean surface before placing the service saddle.

3. The service saddle shall be tightened per manufacturer's recommendation. Care shall be used to prevent damage or distortion of either the corporation stop or service saddle by over tightening.

4. The tap into the pipe shall be made in accordance with the pipe manufacturer's recommendation.

C. Installing Flange Bolts and Nuts

1. Lubricate bolt threads with anti-seize compound prior to installation.

2. Set flanged pipe with the flange bolt holes straddling the pipe horizontal and vertical centerlines.

D. Insulating Bushings and Unions

Pipe or fittings made of nonferrous metals shall be isolated from ferrous metals by nylon insulating pipe bushings, union, or couplings.

E. Backfill Material

The pipe zone material for all service laterals shall be compacted sand per Section 02223.

END OF SECTION

SECTION 15151

DOMESTIC AND RECYCLED WATER FACILITIES IDENTIFICATION

PART 1 - GENERAL

A. Description

All domestic water systems and appurtenances shall be identified as herein described.

This section describes special identification, markings, materials and their installation procedures for recycled water facilities.

All recycled water systems and appurtenances must be marked as described herein to avoid confusion with other utilities and between potable water facilities.

B. Related Work Specified Elsewhere

All related work specified elsewhere, or in other codes or standards, will be as last revised, unless a specific date of issuance is called out in opposition to later revision date(s).

Other sections of the technical specifications, not referenced below, shall also apply to the extent required for proper performance of this work.

1. Painting and Coating: 09900

C. Approved Manufacturers

1. Warning Tape and Pipe Sleeves

a. Griffolyn Company, Inc.
10020 Mykawa Road
P.O. Box 33248
Houston, TX 77033
Phone: (713) 943-0070 or (800) 231-6074

b. Terra Tape, Division of Reef Industries
P. O. Box 33310
Houston, TX 77233
Phone: (800) 231-2417

c. T. Christy Enterprises, Inc.
655 E. Ball Road
Anaheim, CA 92805
Phone: (714) 507-3300

2. Warning Labels and Signs

In all cases the warning labels or signs must be approved prior to installation. Failure to receive prior approval may result in the Contractor removing such sign(s) and providing approved replacement(s). All costs shall be borne by the Contractor for the replacements.

D. Recycled Water Identification

For PVC pipe carrying recycled water:

1. Purple colored pipe marked with the wording "CAUTION: RECYCLED WATER, DO NOT DRINK" on opposite sides of the pipe.

2. Purple identification tape with the wording "CAUTION: RECYCLED WATER, DO NOT DRINK" may be attached directly to the top of the pipe with plastic adhesive tape.

3. Encase PVC pipe with purple colored polyethylene encasement with the wording "CAUTION: RECYCLED WATER, DO NOT DRINK".

For Ductile Iron Pipe

1. Attach purple colored identification tape with the wording "CAUTION: RECYCLED WATER, DO NOT DRINK" directly to the top of the ductile iron pipe and polyethylene encasement with plastic adhesive tape.

2. Encase ductile iron pipe with purple colored polyethylene encasement with the wording "CAUTION: RECYCLED WATER, DO NOT DRINK". Polyethylene encasement shall conform to the requirements of Section 15056.3.C.4, "Plastic Film Wrap".

D. Recycled Water Warning Tape

For PVC or ductile iron pipe, all pipelines shall have purple colored warning tape placed in the trench 12-inches above the pipe with the wording, "CAUTION: RECYCLED WATER LINE BURIED BELOW".

E. Valve Boxes

Valve boxes shall be as specified in Section 15100.

F. Color and Painting Schedule

1. Recycled water facilities shall be painted purple (Pantone 512) per Section 09900.

2. Domestic water facilities shall be blue, with the exception of fire hydrants which shall be painted per the jurisdictional agencies requirements.

G. Warning Signs and Labels

1. The City requires warning labels to be installed on all appurtenances in vaults, such as, but not limited to, air release valves, blow offs, and meters, and on

designated facilities, such as, but not limited to, filtration systems, pressure reducing valves, filters, above ground valves, controller panels and wash down or blow off hydrants on water trucks and temporary construction services.

2. Each filter and every pipe shall be identified with a painted label. In the fenced filter system area, at least one sign shall be posted on the fence which can be readily seen by all operations personnel utilizing the facilities.

3. Painted labels may, at the City representative's discretion be acceptable in lieu of plastic labels.

H. Domestic Water Piping

1. All domestic water piping shall be installed with domestic water identification.

2. All PVC domestic water piping shall be blue or shall be white with blue stenciling appearing on both sides of the pipe with the marking "DOMESTIC WATER" in 5/8-inch letters repeated every 12 inches.

3. Blue warning tape identifying it as a domestic water line and stating "CAUTION: DOMESTIC WATER-LINE BURIED BELOW" may be used as an alternate to blue or stenciled pipe. The tape shall run continuously for the entire length of the main line piping. The tape shall be attached to the top of the pipe with plastic tape banded around the warning tape and pipe every 5 feet on center.

PART 2 - MATERIALS

A. Buried Piping Warning Tape

The plastic warning tape shall be virgin low-density polyethylene specifically formulated for prolonged underground use. Warning tape for domestic water pipeline shall be purple (Pantone 512) with 2-inch black printing having the words, "CAUTION: RECYCLED WATER, DO NOT DRINK" The minimum thickness shall be 4 mils and the overall width of the tape shall be 12 inches (for 8-inch pipe) and 6 inches (for 6-inch and smaller pipe).

B. Warning Labels

Labels shall be inert plastic film specifically formulated for prolonged exposure and shall be prepared with black printing on a purple field having the words: "CAUTION: RECYCLED WATER, DO NOT DRINK" on one side and "AVISO: AGUA IMPURA – NO TOMAR" on the other side. The minimum thickness shall be 4 mils for adhesive backed labels and 10 mils for tag type labels. Tag type labels shall have reinforced tie holes and shall be attached with heavy-duty nylon fasteners. The size, type of label and location will be dictated by each individual application and subject to acceptance by the City's representative. The minimum size shall be 1/2-inch letters.

PART 3 - EXECUTION

A. Installation of Pipe Warning Tape

Warning tapes shall be installed directly on the top of the pipe longitudinally and shall be centered. The warning tape shall be installed continuously for the length of the pipe and shall be fastened to each pipe length by plastic adhesive tape banded around the pipe and warning tape at no more than 5-foot intervals. Taping attached to the sections of pipe before installing in the trench shall have 5-foot minimum overlap for continuous coverage.

B. Installation of Warning Labels

Warning labels shall be firmly attached to all appurtenances using heavy-duty nylon fasteners.

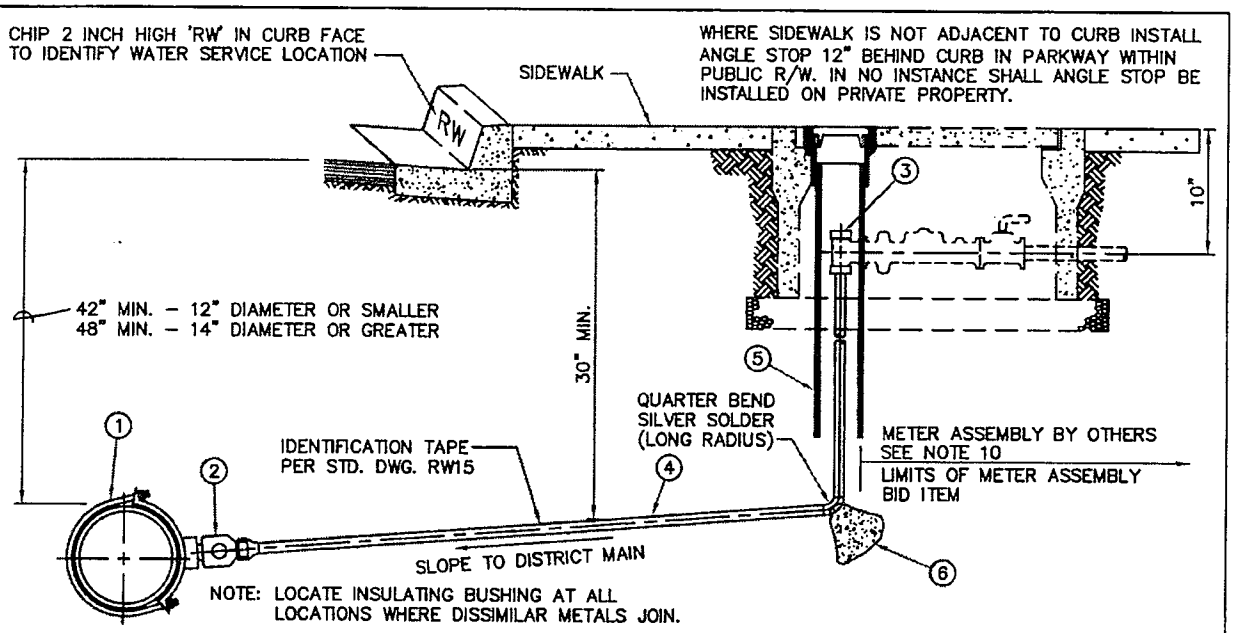
C. Installation of Witness Markers

Witness markers shall be installed over pipe in unpaved areas, open space areas, at appurtenances, including but not limited to valves, air release/vacuum breaks, dead ends, inflection points, tees, and at intervals not greater than 200 feet.

Witness markers shall be embedded into the soil at least 18-inches and shall be equipped with a barb or other such device to secure it in the surrounding soil.

END OF SECTION

APPENDIX A:
WBMWD STANDARD DRAWINGS



CONSTRUCTION ITEMS / MATERIALS LIST			
ITEM NO.	SIZE AND DESCRIPTION	MANUFACTURER	MFR. CAT. NO. OR SPEC.
①	SERVICE SADDLE WITH CC THR'D. FOR: POLYVINYL–CHLORIDE PIPE (PVC) DUCTILE–IRON PIPE (D.I.P.)	 MUELLER JAMES JONES MUELLER FORD	 H–13000 SERIES J–996 DR 2A SERIES F–202B
②	2" BRONZE CORPORATION STOP, INSULATING BUSHING	MUELLER JAMES JONES	H–15000 J–1930
③	2" BRONZE ANGLE BALL METER VALVE WITH LOCKWING	FORD MUELLER JAMES JONES	FV23–777W B–24286 J–1973W
④	2" COPPER TUBING	—	TYPE "K" SOFT
⑤	VALVE BOX AND COVER PER STANDARD DRAWING RW7	—	—
⑥	THRUST BLOCK – 0.7 CU. FT.	—	—

NOTE:

1. DOUBLE STRAP SERVICE SADDLE FOR ALL MAINS.
2. INSTALL CORPORATION STOP WITH KEY SIDEWAYS, IN OPEN POSITION (FOR HOT TAP).
3. THE CORPORATION STOP TAP WILL BE MADE AS SPECIFIED BY THE PIPE MANUFACTURER. ALL DRY TAPS WILL BE MADE USING MACHINE GUIDE OR PILOT TAP.
4. THE WATER SERVICE SHALL EXTEND PERPENDICULAR TO THE CENTERLINE OF THE STREET FROM THE WATER MAIN TO THE METER STOP EXCEPT IN CUL–DE–SAC ENDS, WHERE NON–PERPENDICULAR INSTALLATION IS ALLOWED.
5. NO TAP TO MAIN SHALL BE WITHIN 24" OF VALVE, COUPLING, JOINT, OR FITTING.
6. NO SPLICES WILL BE PERMITTED BETWEEN CORPORATION STOP AND ANGLE METER STOP EXCEPT WHEN SERVICE RUN EXCEEDS 60 FEET, IN WHICH CASE A SILVER SOLDER COUPLING SHALL BE USED.
7. SERVICE TERMINATION POINT SHALL NOT BE PLACED IN DRIVEWAYS.
8. WARNING TAG SHALL BE PLACED ON THE METER.
9. TRENCH BACKFILL SHALL BE ONE SACK SLURRY (100–E–100) AS REQUIRED BY LOCAL JURISDICTIONAL AGENCY/CITY, UNLESS OTHERWISE SHOWN.
10. METER BOX AND ASSEMBLY TO BE FURNISHED AND INSTALLED BY PURVEYOR.
11. ALL SWEAT FITTINGS SHALL BE ASSEMBLED WITH SILVER SOLDER.
12. FINAL LOCATION OF METER ASSEMBLY SHALL BE CONFIRMED WITH THE DISTRICT AND THE PURVEYOR PRIOR TO CONSTRUCTION.

REVISION	DRAWN	APP'D.	DATE
MARCH 2010			

APPROVED

DISTRICT ENGINEER RCE DATE

WEST BASIN MUNICIPAL WATER DISTRICT

2–INCH RECYCLED WATER SERVICE

STANDARD DRAWING
RW3

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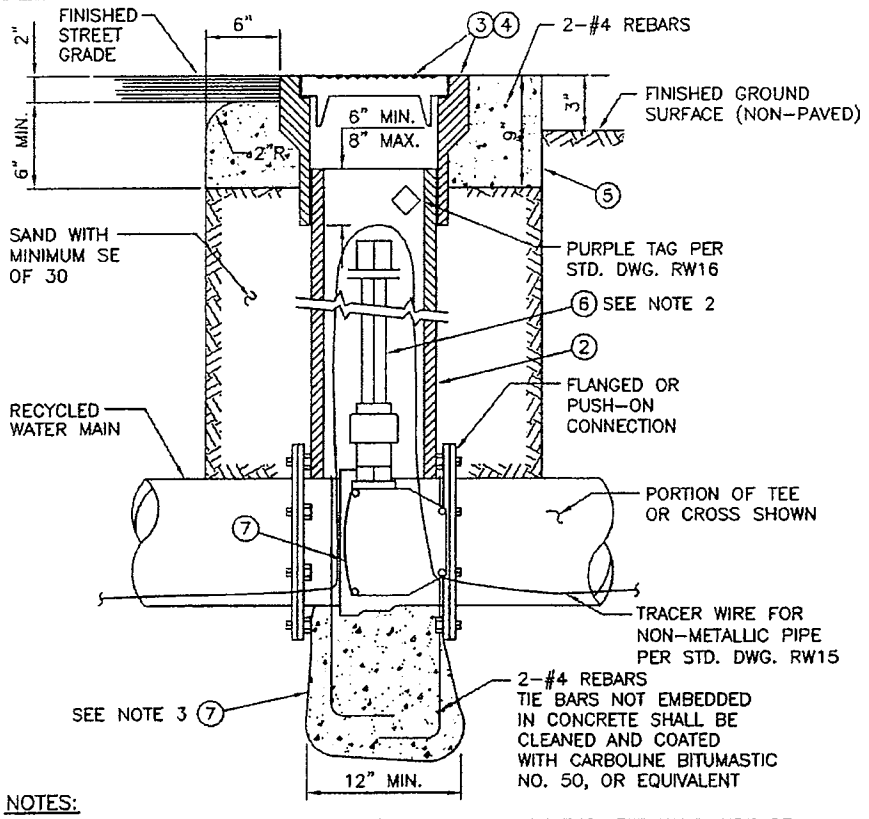

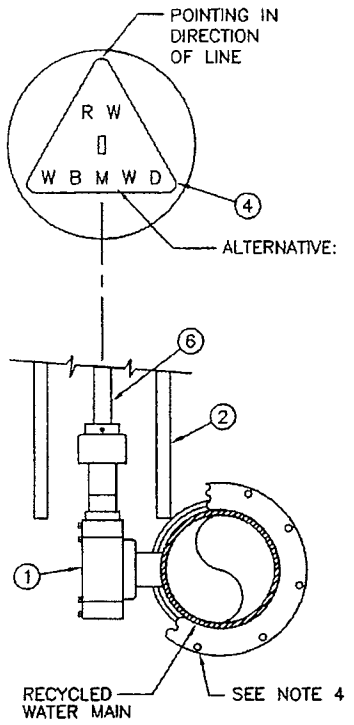

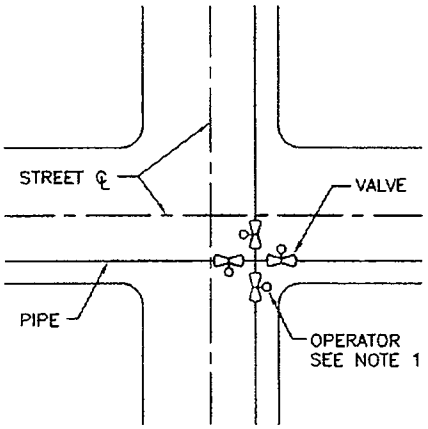

BUTTERFLY VALVE OPERATOR POSITIONS

NOTES:

1. BUTTERFLY VALVE OPERATORS SHALL BE LOCATED ON THE LEFT HAND SIDE OF THE VALVE WHEN STANDING ON THE FLANGED END OF THE VALVE (AT THE TEE OR CROSS) AND LOOKING THROUGH THE VALVE TOWARD THE PIPE END. AT STREET INTERSECTIONS WHERE VALVE BOX LOCATION MAY INTERFERE WITH PROPOSED CONCRETE CROSS GUTTER, PIPELINE SHALL BE MOVED AWAY FROM STANDARD LOCATION AS REQUIRED PER DETAIL HEREON.
2. PROVIDE VALVE STEM EXTENSION IF DEPTH TO VALVE NUT EXCEEDS 4 FEET.
3. ANCHOR BLOCK REQUIRED AT ALL TIMES. ANCHOR BLOCK SHALL BE TRENCH WIDTH PLUS TWO PIPE DIAMETERS WIDE AND SHALL EXTEND VALVE SIZE PLUS SIX INCHES BELOW BOTTOM OF TRENCH.
4. ALL CONTRACTOR PROVIDED BURIED BOLTS SHALL BE 316 STAINLESS STEEL AND COATED WITH CARBOLINE BITUMASTIC NO. 50 OR EQUIVALENT.

CONSTRUCTION ITEMS / MATERIALS LIST

ITEM NO.	SIZE AND DESCRIPTION	MANUFACTURER	MFR. CAT. NO. OR SPEC.
1	BUTTERFLY VALVE OR RESILIENT WEDGE GATE VALVE PER STD. SPECIFICATIONS	——	——
2	8" PVC SDR35 PIPE	——	——
3 4	10 1/4" BODY AND COVER (BOX LID)	BROOKS	4-TT
5	CONCRETE RING, CLASS 560-C-3250	——	——
6	VALVE STEM EXTENSION PER STANDARD DRAWING RW8 (SEE NOTE 2)	——	——
7	ANCHOR BLOCK PER STANDARD DRAWING RW19 (SEE NOTE 3)	——	——

REVISION	DRAWN	APP'D.	DATE
JUNE 2003			
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DISTRICT ENGINEER RCE DATE

WEST BASIN MUNICIPAL WATER DISTRICT

VALVE, VALVE BOX, AND COVER

STANDARD DRAWING RW7

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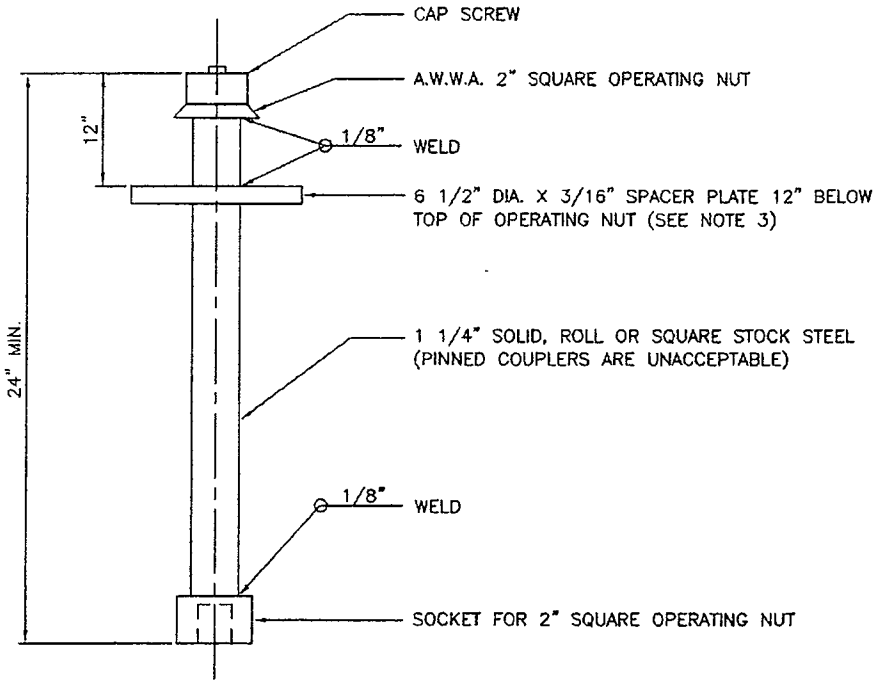

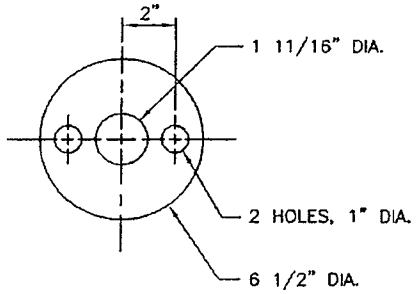

SPACER PLATE
PLAN

NOTES:

1. PROVIDE VALVE STEM EXTENSION WHEN DEPTH TO OPERATING NUT EXCEEDS 48" (FABRICATE EXTENSION TO FIELD MEASUREMENT – SEE NOTE 2).
2. NO VALVE STEM EXTENSION SHALL BE LESS THAN 2 FEET IN LENGTH. TERMINATE EXTENSION 24" TO 36" FROM FINISHED GRADE.
3. PROVIDE ADDITIONAL SPACER PLATE WHEN DISTANCE TO BOTTOM SOCKET EXCEEDS 5 FEET.
4. HOT DIP GALVANIZE EXTENSION AFTER FABRICATION.

REVISION	DRAWN	APP'D.	DATE
JUNE 2003			

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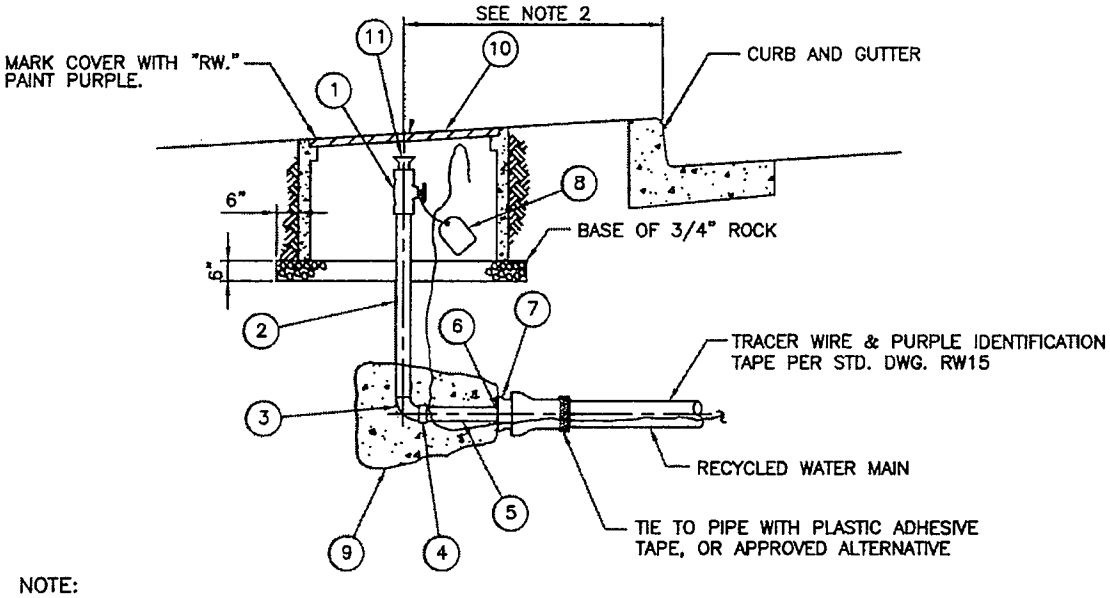
WEST BASIN MUNICIPAL WATER DISTRICT

VALVE STEM EXTENSION

STANDARD DETAIL
RW8

W:\ENGINEERING\WB STANDARD SPECS AND DRAWINGS\West Basin Standard Specs_2007\Standard Specs WB\RW-8.dwg 02/22/2010 11:24



NOTE:

1. WHEN BLOW OFF VALVE IS PLACED BEHIND CURB USE BROOKS 66T OR EISEL 6T METER BOX WITH STEEL LID OR APPROVED EQUAL. WHEN BLOW OFF VALVE IS PLACED IN STREET USE 24" PRECAST CONCRETE MANHOLE WITH ALHAMBRA A-1254B COVER OR APPROVED EQUAL.
2. EXACT LOCATION OF BLOWOFF TO BE AS PROVIDED ON CONSTRUCTION PLANS AND AS APPROVED BY THE DISTRICT.

CONSTRUCTION ITEMS / MATERIALS LIST

ITEM NO.	SIZE AND DESCRIPTION	MANUFACTURER	MFR. CAT. NO. OR SPEC.
(1)	2" BRONZE BALL VALVE	MUELLER FORD	B-25174 B-21-777
(2)	2" COPPER TUBING	—	TYPE "K" SOFT
(3)	2" COPPER 90° ELBOW S.J. x S.J. (LONG RADIUS)	—	—
(4)	2" BRONZE COUPLING – COPPER TO IP THREAD	—	—
(5)	2" BRASS NIPPLE, IP, THREAD x IP THREAD	—	—
(6)	RIGID PVC REDUCING BUSHING (2-1/2" x 2")	—	—
(7)	DUCTILE IRON PLUG, PIPE SIZE x 2-1/2" IP. THREAD TAP	—	—
(8)	WARNING TAG PER STANDARD DRAWING RW16	—	—
(9)	THRUST BLOCK, PER STANDARD DRAWING RW19	—	—
(10)	PRECAST CONCRETE VAULT WITH COVER (SEE NOTE 1)	—	—
(11)	2" COPPER/PVC THREADED PLUG	—	—

REVISION	DRAWN	APP'D.	DATE
JUNE 2003			

APPROVED

DISTRICT ENGINEER RCE DATE

WEST BASIN MUNICIPAL WATER DISTRICT

DEAD END WITH TEMPORARY 2-INCH BLOW OFF

STANDARD DRAWING RW12

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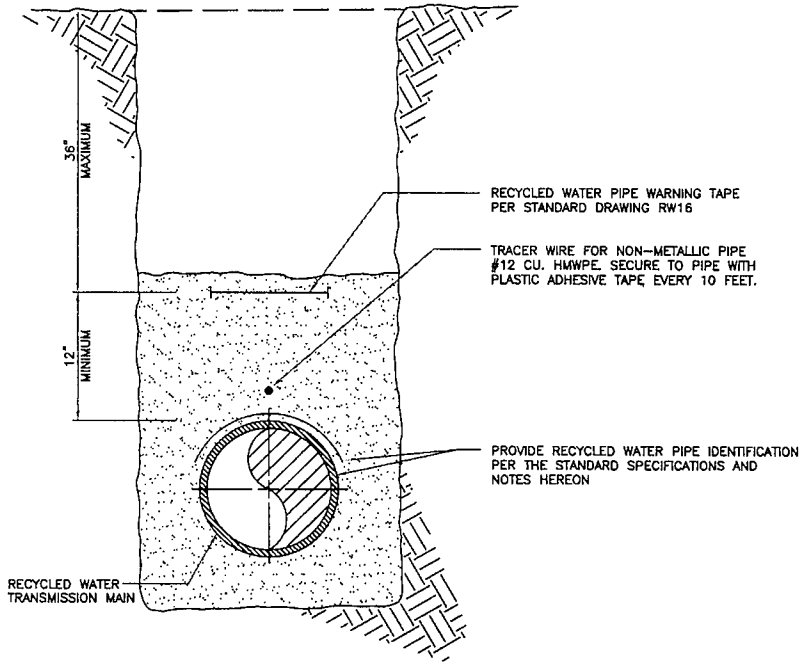


NOTES:

ALL RECYCLED WATER PIPELINES, INCLUDING SERVICE LINES AND ATTACHED APPURTENANCES SHALL BE PROVIDED WITH IDENTIFICATION PER ONE OF THE FOLLOWING ALTERNATIVES:

PVC PIPE ALTERNATIVE:

1. PIPE SHALL BE COLORED PURPLE AND INTEGRALLY STAMPED/MARKED WITH CONTINUOUS WORDING "CAUTION: RECYCLED WATER, DO NOT DRINK" PRINTED IN 5/8" BLACK LETTERING ON OPPOSITE SIDES OF THE PIPE.
2. AS AN OPTION TO PURPLE PIPE, PURPLE COLORED POLYETHYLENE IDENTIFICATION TAPE WITH CONTINUOUS WORDING "CAUTION: RECYCLED WATER, DO NOT DRINK" MAY BE ATTACHED TO THE TOP OF PIPE PER STANDARD DRAWING RW16.
3. AS AN OPTION TO EITHER OF THE ABOVE ALTERNATIVES, PURPLE COLORED POLYETHYLENE WRAP WITH CONTINUOUS WORDING "CAUTION: RECYCLED WATER, DO NOT DRINK" MAY BE USED TO ENCASE THE PIPE PER STANDARD DRAWING RW16.

DUCTILE IRON PIPE ALTERNATIVE:

1. PURPLE COLORED POLYETHYLENE IDENTIFICATION TAPE WITH CONTINUOUS WORDING "CAUTION: RECYCLED WATER, DO NOT DRINK" SHALL BE ATTACHED TO THE TOP OF PIPE PER STANDARD DRAWING RW16.
2. AS AN OPTION TO THE ABOVE ALTERNATIVE, PURPLE COLORED POLYETHYLENE WRAP WITH CONTINUOUS WORDING "CAUTION: RECYCLED WATER, DO NOT DRINK" MAY BE USED TO ENCASE THE PIPE PER STANDARD DRAWING RW16. PURPLE POLYETHYLENE ENCASEMENT SHALL BE USED AS THE SECOND LAYER OF ENCASEMENT REQUIRED FOR DUCTILE IRON PIPE CONSTRUCTION PER THE STANDARD SPECIFICATIONS.

STEEL PIPE ALTERNATIVE:

1. PURPLE COLORED POLYETHYLENE IDENTIFICATION TAPE WITH CONTINUOUS WORDING "CAUTION: RECYCLED WATER, DO NOT DRINK" SHALL BE ATTACHED TO THE TOP OF PIPE PER STANDARD DRAWING RW16.

REVISION	DRAWN	APP'D.	DATE
JUNE 2003			

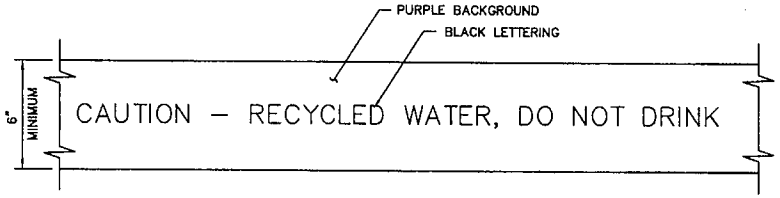
APPROVED

DISTRICT ENGINEER RCE DATE

WEST BASIN MUNICIPAL WATER DISTRICT

RECYCLED WATER PIPE IDENTIFICATION

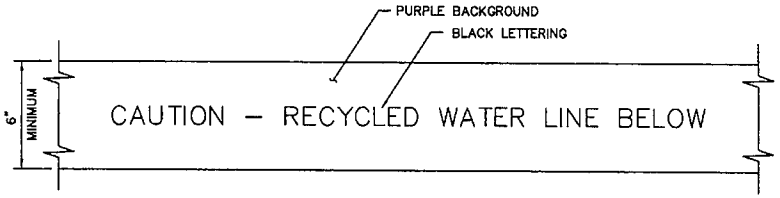
STANDARD DRAWING RW15



FOR ATTACHMENT TO PIPE

RECYCLED WATER PIPE IDENTIFICATION TAPE

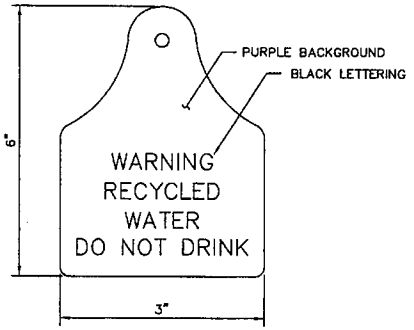
N.T.S.



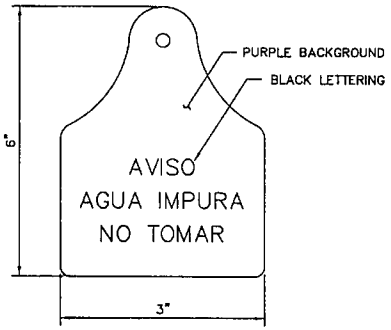
FOR BURIAL 12" MINIMUM ABOVE PIPE

RECYCLED WATER PIPE WARNING TAPE

N.T.S.



FRONT



BACK

RECYCLED WATER WARNING TAGS

N.T.S.

NOTES:

1. RECYCLED WATER WARNING TAGS SHALL CONSIST OF WEATHERPROOF PLASTIC, 3-INCH BY 4-INCH, WITH PURPLE BACKGROUND AND BLACK LETTERING. WARNING TAGS SHALL BE ATTACHED TO EACH RECYCLED WATER DEVICE WITH A NYLON TIE WRAP.
2. RECYCLED WATER IDENTIFICATION TAPE SHALL CONSIST OF A MINIMUM 4 MIL. POLYETHYLENE WITH METALLIC BACKING, WITH PURPLE BACKGROUND AND BLACK LETTERING. TAPE WIDTH SHALL BE 6-INCHES FOR PIPE 6-INCH AND SMALLER AND 12-INCHES FOR PIPE 8-INCH AND LARGER. LETTERING SHALL BE 2-INCHES HIGH AND THE MESSAGE SHALL REPEAT EVERY 36-INCHES. IDENTIFICATION TAPE SHALL BE FASTENED TO THE PIPE WITH PLASTIC ADHESIVE TAPE BANDED AROUND THE PIPE AT NO MORE THAN 5-FOOT INTERVALS, OR AS APPROVED THE DISTRICT.
3. PURPLE COLORED POLYETHYLENE ENCASEMENT WITH A MINIMUM THICKNESS OF 8 MILS MAY BE SUBSTITUTED FOR IDENTIFICATION TAPE SPECIFIED IN NOTE 2 ABOVE. MESSAGE SHALL CONTAIN 1-INCH HIGH LETTERING REPEATING EVERY 24-INCHES.
4. RECYCLED WATER WARNING TAPE MEETING THE SAME SPECIFICATIONS AS NOTE 2 ABOVE SHALL BE BURIED ABOVE THE PIPE ZONE BEDDING A MINIMUM OF 12-INCHES ABOVE THE PIPE.
5. WARNING TAGS, IDENTIFICATION/WARNING TAPE AND POLYETHYLENE ENCASEMENT SHALL BE AS MANUFACTURED BY T. CHRISTY ENTERPRISES, TERRA TAPE (DIVISION OF REEF INDUSTRIES) OR APPROVED EQUAL.
6. RECYCLED WATER PIPELINES LOCATED IN NON-PAVED AREAS OUTSIDE STREET RIGHT-OF-WAY SHALL ALSO BE IDENTIFIED WITH MARKER POSTS PER STD. DWG. RW28.
7. PURPLE COLOR SHALL BE PANTONE 512.

REVISION	DRAWN	APP'D.	DATE
JUNE 2003			

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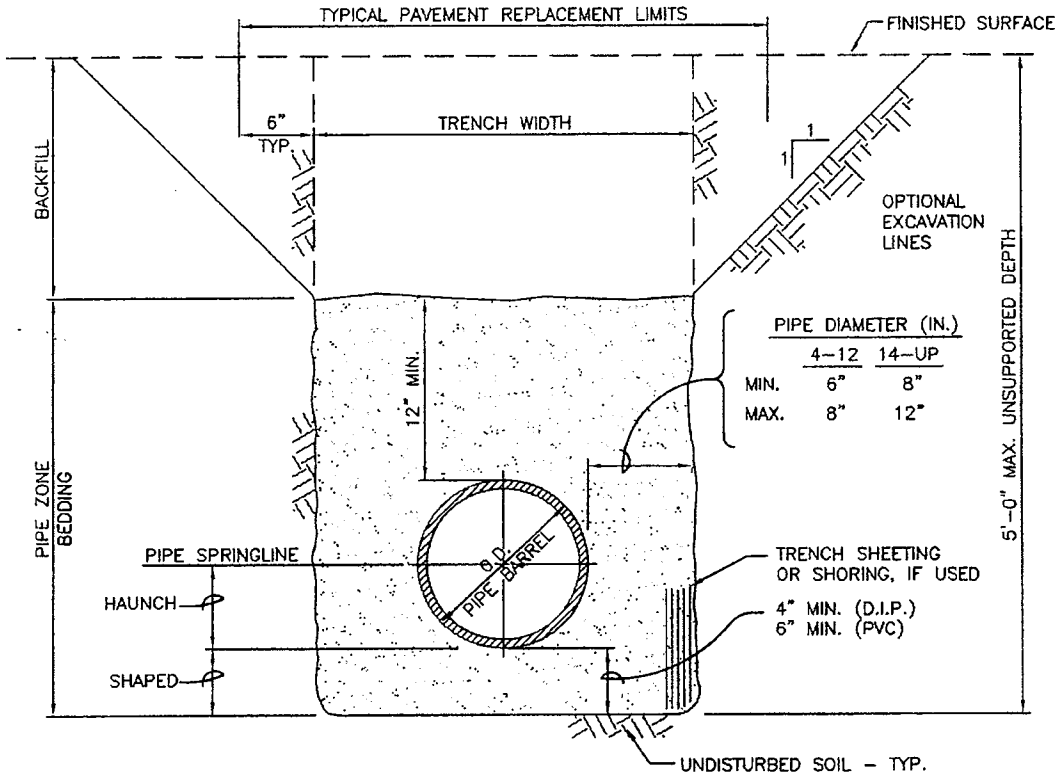
DISTRICT ENGINEER RCE DATE

WEST BASIN MUNICIPAL WATER DISTRICT

WARNING TAGS AND IDENTIFICATION TAPE

STANDARD DRAWING RW16

REPLACE PAVED SURFACE AND BASE PER RW18 OR JURISDICTIONAL REQUIREMENTS AND PERMITS (WHICHEVER IS MORE STRINGENT).



NOTE:

1. SHOULD LARGE GRAVEL OR COBBLES BE ENCOUNTERED AT THE TRENCH BOTTOM, THEY SHALL BE REMOVED AND REPLACED WITH GRANULAR MATERIAL WHICH SHALL BE COMPACTED TO PROVIDE UNIFORM SUPPORT AND A FIRM FOUNDATION.
2. IF EXCESSIVELY WET, SOFT, SPONGY, UNSTABLE, OR SIMILARILY UNSUITABLE MATERIAL IS ENCOUNTERED AT THE TRENCH BOTTOM, IT SHALL BE REMOVED AND REPLACED BY CRUSHED ROCK OR GRAVEL OF SUFFICIENT THICKNESS TO FORM A FIRM FOUNDATION.
3. WHERE WET, UNSTABLE OR RUNNING SOIL IS ENCOUNTERED, SOLID SHEETING IS REQUIRED FOR ALL VERTICAL TRENCH WALLS.
4. TRENCH SHEETING OR SHORING SHALL BE A MINIMUM OF 6 INCHES FROM THE PIPE BARREL AT SPRINGLINE.
5. VERTICAL TRENCH WALLS
   a) FOR DEPTHS UP TO 5'-0", NO TRENCH SUPPORT IS REQUIRED UNLESS UNSTABLE OR RUNNING SOIL IS ENCOUNTERED.
   b) FOR DEPTHS EXCEEDING 5'-0", SHEETING, SHORING OR OTHER EQUIVALENT BRACING SHALL BE PROVIDED IN ACCORDANCE WITH THE CALIFORNIA DEPARTMENT OF INDUSTRIAL RELATIONS (CAL/OSHA) CODE OF REGULATIONS TITLE 8, SUB CHAPTER 4 "CONSTRUCTION SAFETY ORDERS".
6. OPTIONAL COMBINATION OF VERTICAL AND SLOPING TRENCH WALLS
   a) TRENCH DEPTHS EXCEEDING 5'-0" SHALL HAVE VERTICAL WALLS IN PIPE ZONE UNLESS OTHERWISE APPROVED BY THE ENGINEER.
   b) FOR TRENCHES WITH COMBINED WALLS AND ANY DEPTH EXCEEDING 3'-6", THE CONTRACTOR SHALL PROTEDT IN ACCORDANCE WITH THE CALIFORNIA DEPARTMENT OF INDUSTRIAL RELATIONS (CAL/OSHA) CODE OF REGULATIONS TITLE 8, SUB CHAPTER 4 "CONSTRUCTION SAFETY ORDERS".
7. BEDDING SHALL BE PER STANDARD SPECIFICATIONS, EXCEPT THAT
   a) ALL PIPE SHALL HAVE A BEDDING WITH AN SE OF 30 MINIMUM.
   b) SE OF 30 AND HAUNCH BEDDING SHALL BE HAND TAMPED TO 90% RELATIVE COMPACTION MIN. FOR PVC AND ALL OTHER FLEXIBLE PIPE INSTALLATIONS, WHEREUPON BEDDING ABOVE SPRINGLINE SHALL BE COMPACTED CONCURRENTLY WITH THE BACKFILL.

REVISION	DRAWN	APP'D.	DATE
JUNE 2003			

APPROVED

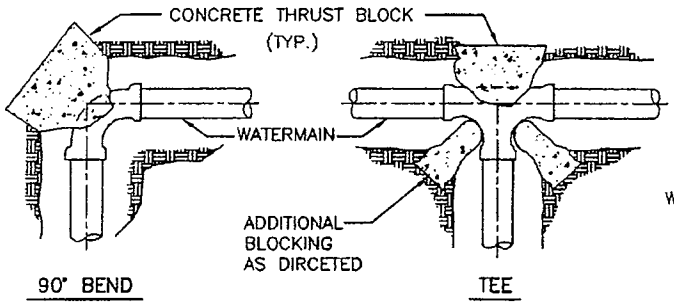
DISTRICT ENGINEER RCE DATE

WEST BASIN MUNICIPAL WATER DISTRICT

PIPE TRENCHING AND BEDDING

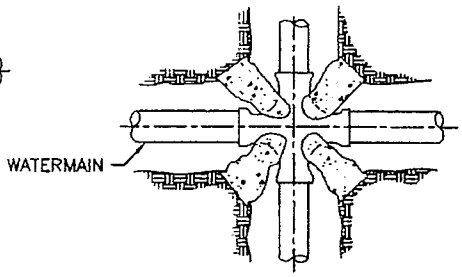
STANDARD DRAWING
RW17

W:\ENGINEERING\WB STANDARD SPECS AND DRAWINGS\West Basin Standard Specs_2007\Standard Specs WB\RW-17-bw.dwg 02/22/2010 11:37



90° BEND

TEE



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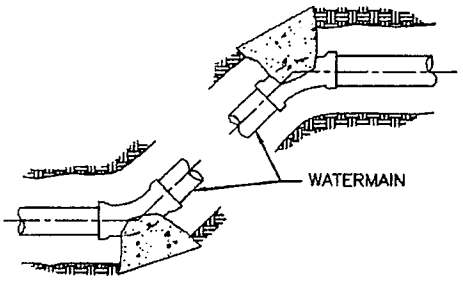
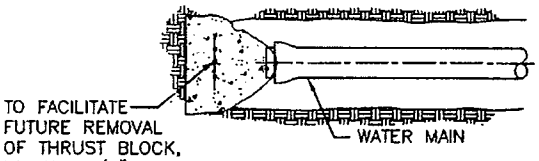
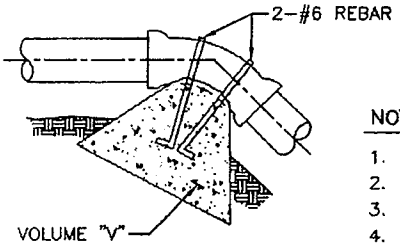


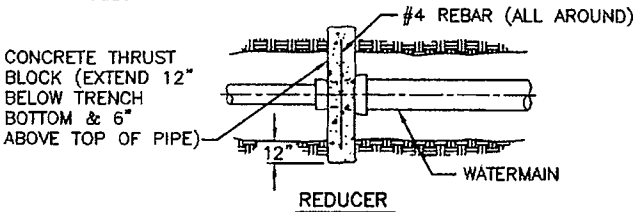
BEND



PLUG



VERTICAL BEND



REDUCER

NOTES:

1. ALL CONCRETE FOR THRUST BLOCK TO BE CLASS 560-C-3250.
2. CONCRETE TO BE KEPT CLEAR OF ALL PIPE, NUTS, BOLTS, AND ENDS OF FITTINGS.
3. ALL BEARING AREAS TO BE AGAINST UNDISTURBED SOIL.
4. BEARING AREAS ARE BASED ON A TEST OF 200 PSI AND SOIL BEARING CAPACITY OF 2000 PSF. THE RATIO OF WIDTH TO HEIGHT CANNOT EXCEED 1 1/2.
5. DISTRICT'S FIELD REPRESENTATIVE MAY INCREASE THE SIZE OF THRUST BLOCK, IF IN HIS OPINION, THE SOIL BEARING VALUE IS LESS THAN THE ASSUMED VALUE.
6. TIE BARS NOT EMBEDDED IN CONCRETE SHALL BE CLEANED AND COATED WITH BITUMASTIC NO. 50 OR EQUIVALENT.
7. THRUST BLOCK ON CROSSES SHALL ONLY BE USED WHEN THERE IS A STUB-OUT ON ONE OR MORE SIDES.
8. PROVIDE POLYETHYLENE (8 MIL MIN) BETWEEN FITTING AND CONCRETE.

PIPE SIZE	HORIZONTAL/VERTICAL ANCHOR AND THRUST BLOCK								
	90°		45°		22 1/2°		11 1/4°		TEE/PLUG
	"A"	"V"	"A"	"V"	"A"	"V"	"A"	"V"	"A"
3"/4"	3	1.4	2	1.0	2	.5	1	.3	2
6"	6	2.9	3	2.0	2	1.1	1	.6	4
8"	10	5	5	3.5	3	1.9	1.5	1.0	7
10"	16	7.5	8	5.3	5	2.9	2.5	1.5	12
12"	21	10.6	12	7.5	6	4.0	3	2.1	16
14"	30	14.2	16	10	8	5.4	4	2.8	21
16"	38	18.3	21	13	10	7	5	3.6	27

"A" DESIGNATES AREA IN SQ. FT. OF HORIZONTAL THRUST BLOCK.
"V" DESIGNATES VOLUME IN C.Y. OF VERTICAL ANCHOR BLOCK.

REVISION	DRAWN	APP'D.	DATE
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WEST BASIN MUNICIPAL WATER DISTRICT

TYPICAL THRUST BLOCKS

STANDARD DRAWING
RW19

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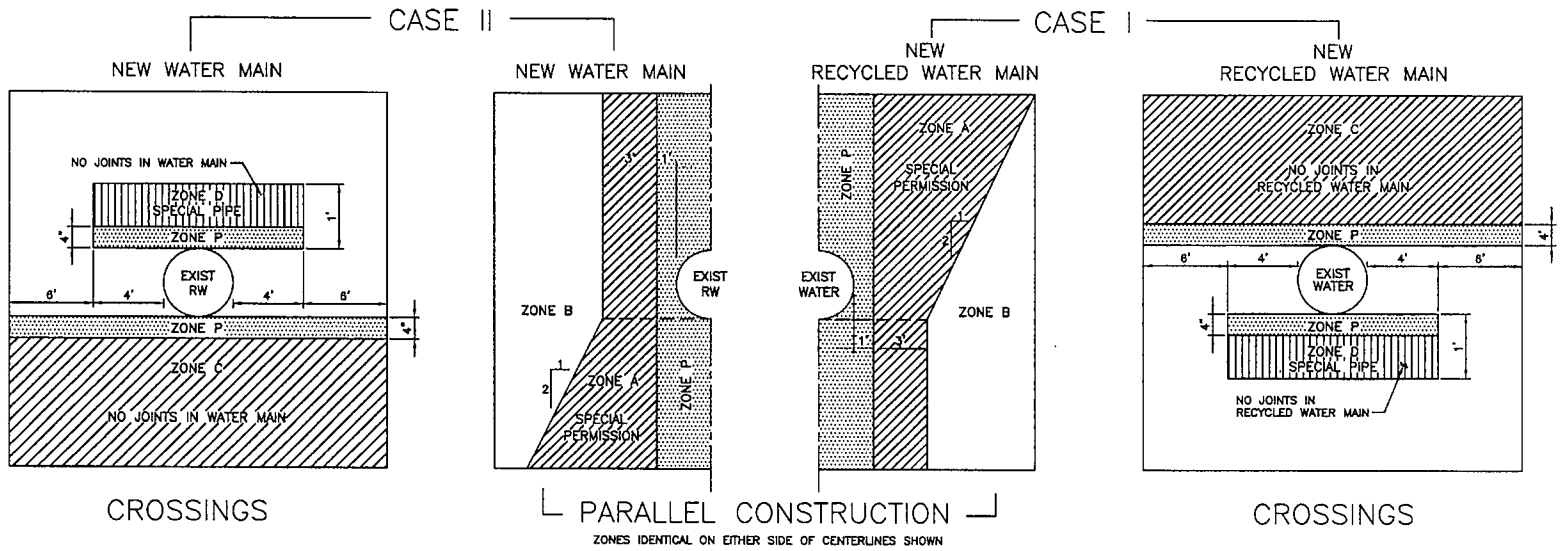

CASE II

CONSTRUCTION REQUIREMENTS FOR DOMESTIC WATER MAINS

ZONE

- A — SPECIAL PERMISSION REQUIRED. DO NOT LOCATE ANY PARALLEL WATER MAIN IN THIS AREA WITHOUT DISTRICT AND STATE HEALTH DEPARTMENT APPROVAL.
- B — NOT APPLICABLE
- C — IF THE SEWER OR RECYCLED WATER MAIN DOES NOT MEET THE REQUIREMENTS OF CASE I, ZONE C THE WATER MAIN SHALL BE CONSTRUCTED AS DESCRIBED FOR ZONE B ABOVE, WITH THE EXCEPTION THAT THE WATER MAIN SHALL CONTAIN NO JOINTS IN ZONE C.
- D — IF THE SEWER OR RECYCLED WATER MAIN DOES NOT MEET THE REQUIREMENTS OF CASE I, ZONE D THE WATER MAIN SHALL ALSO BE CONSTRUCTED AS DESCRIBED FOR ZONE B ABOVE, WITH THE EXCEPTION THAT THE WATER MAIN SHALL CONTAIN NO JOINTS IN ZONE D.
- P — PROHIBITED ZONE; NO DOMESTIC WATER MAINS SECTION 64630 (e) (2) CALIFORNIA ADMINISTRATIVE CODE, TITLE 22.

CASE I

CONSTRUCTION REQUIREMENTS FOR RECYCLED WATER MAINS

ZONE

- A — SPECIAL PERMISSION REQUIRED. DO NOT LOCATE ANY PARALLEL SEWER OR RECYCLED WATER MAIN IN THIS AREA WITHOUT DISTRICT ENGINEER AND STATE HEALTH DEPARTMENT APPROVAL.
- B — NOT APPLICABLE
- C — DIP POLYETHYLENE LINED WITH MECHANICAL JOINTS, A CONTINUOUS SECTION OF C900 PVC PIPE CLASS 200 CENTERED OVER THE PIPE BEING CROSSED, OR ANY SEWER PIPE IN A 1/4" THICK CONTINUOUS STEEL CASING WITH ANNULAR SPACE PRESSURE GROUTED FOR SEWER LINES; FOR RECYCLED WATER MAINS USE ANY OF THE REQUIREMENTS DESCRIBED FOR CASE II, ZONE C.
- D — A CONTINUOUS SECTION OF DIP POLYETHYLENE LINED WITH PUSH-ON TYPE RUBBER RING JOINTS, A CONTINUOUS SECTION OF C900 PVC PIPE CLASS 200 CENTERED ON THE PIPE BEING CROSSED, ANY SEWER PIPE IN A 1/4" THICK CONTINUOUS STEEL CASING WITH ANNULAR SPACE PRESSURE GROUTED OR ANY SEWER PIPE SEPARATED BY A 10'± 10'± 4" THICK REINFORCED CONCRETE; FOR RECYCLED WATER MAINS USE ANY OF THE REQUIREMENTS DESCRIBED FOR CASE II, ZONE D.
- P — PROHIBITED ZONE; NO SEWERS OR RECYCLED WATER MAINS; SECTION 64630 (e) (2) CALIFORNIA ADMINISTRATIVE CODE, TITLE 22.

NOTES:

1. THE DESIGN AND INSTALLATION OF SEWER FORCE MAINS REQUIRE SPECIAL DISTRICT REVIEW AND APPROVAL.
2. THE DESIGN OF ALL WATER AND RECYCLED MAINS 24-INCH IN DIAMETER AND LARGER SHALL BE REVIEWED AND APPROVED BY THE STATE HEALTH DEPARTMENT PRIOR TO CONSTRUCTION.

REF. SOURCE: "GUIDANCE CRITERIA FOR THE SEPARATION OF WATER MAINS AND NON-POTABLE PIPELINES", STATE OF CALIFORNIA, DEPARTMENT OF HEALTH SERVICES; DATED APRIL 14, 2003.

REVISION	DRAWN	APP'D.	DATE
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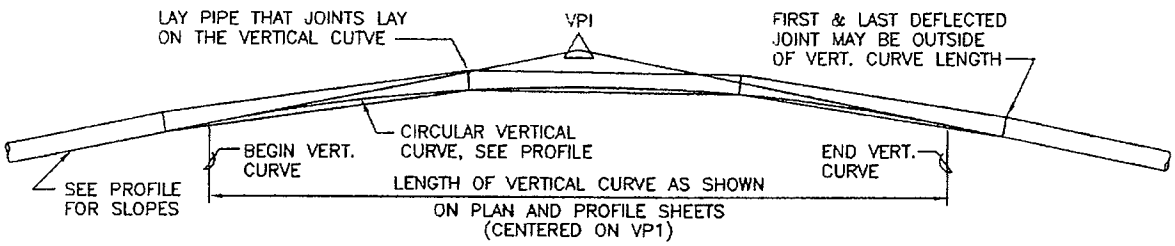
WEST BASIN MUNICIPAL WATER DISTRICT

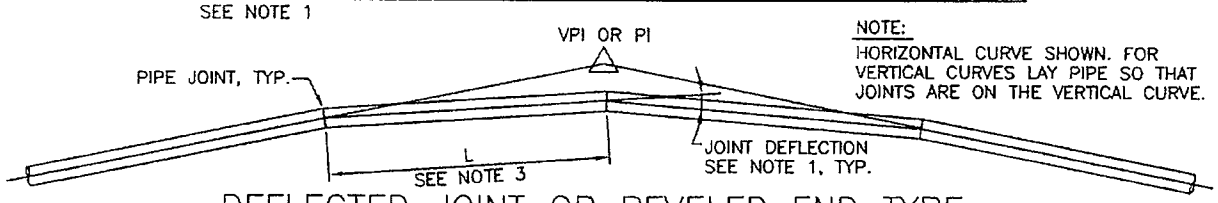
CRITERIA FOR THE SEPARATION OF WATER MAINS FROM RECYCLED WATER MAINS

STANDARD DRAWING RW21

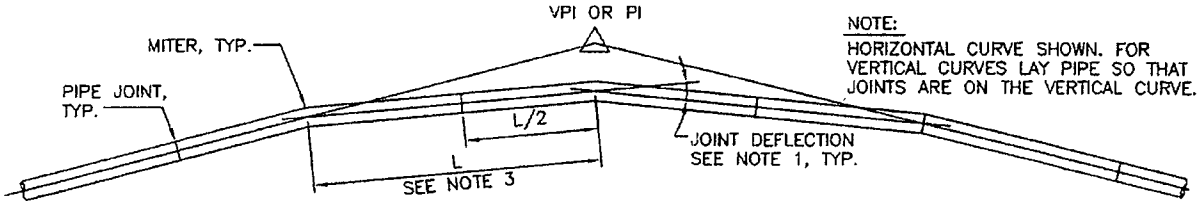


TYPICAL VERTICAL CURVE (VC) UP OR DOWN

SEE NOTE 1



DEFLECTED JOINT OR BEVELED END TYPE



MITERED TYPE

NOTES:

1. WHERE CURVES CANNOT BE INSTALLED BY JOINT DEFLECTIONS OF STANDARD PIPE LENGTH, THE CONTRACTOR MAY SELECT FROM THE FOLLOWING OPTIONS:
   a) USE SHORTER PIPE LENGTHS (SEE NOTE 3) AND THE ALLOWABLE JOINT DEFLECTION (SEE NOTES 4a & 4b).
   b) USE SPECIAL BEVELED ENDS OR MITERED PIPE LENGTHS (SEE NOTE 4c).

2. DEFLECTION OF VERTICAL CURVES:

3. THE DISTANCE BETWEEN JOINTS OR MITERS SHALL BE:

   a) FOR VERTICAL CURVES UP–10 FT. MIN. & 10 FT. MAX.
   b) FOR VERTICAL CURVES DOWN FROM DEFLECTED POINTS – 10 FT. MIN. & 40 FT. MAX.
   c) FOR VERTICAL CURVES DOWN FROM BEVELED END OR SINGLE MITERED PIPE SECTION – 30 FT. MIN. & 40 FT. MAX.
   d) FOR HORIZONTAL CURVES – 10 FT. MIN. & 40 FT. MAX.

4. THE MAXIMUM ALLOWABLE JOINT DEFLECTIONS FOR CURVES SHALL BE:
   a) FOR WSP CURVES FROM DEFLECTED JOINTS. THE JOINT DEFLECTIONS SHALL BE NO MORE THAN 75 PERCENT OF THE MAXIMUM ALLOWABLE AS RECOMMENDED BY THE PIPE MANUFACTURER.
   b) FOR DIP CURVES FROM DEFLECTED JOINT. THE MAXIMUM DEFLECTED ANGLE SHALL BE 5.0 DEGREES OR 75 PERCENT OF THE MANUFACTURER'S RECOMMENDED JOINT DEFLECTION, WHICHEVER IS LESS.
   c) FOR CURVES FROM BEVELED JOINTS OR SINGLE MITERED PIPE SECTIONS, THE PIPE BEVELS OR MITERS SHALL BE MORE THAN 5.0 DEGREES.

5. ALL ELEMENTAL ANGLES AND LENGTHS SHALL BE EQUAL IN A BEND.

6. CURVES DO NOT REQUIRE SPECIAL BEDDING OR BACKFILL. USE STANDARD TRENCH BACKFILL AS SPECIFIED.

7. FOR COMBINATION VERTICAL AND HORIZONTAL CURVES THE REQUIREMENTS FOR BOTH CONDITIONS SHALL BE COMBINED.

REVISION	DRAWN	APP'D.	DATE
JUNE 2003			

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WEST BASIN MUNICIPAL WATER DISTRICT

PIPELINE CURVES

STANDARD DRAWING RW42

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APPENDIX B:
WBMWD STANDARD SPECIFICATIONS

CENTRAL BASIN MUNICIPAL WATER DISTRICT
WEST BASIN MUNICIPAL WATER DISTRICT

SUPPLEMENTAL STANDARD SPECIFICATIONS
Water Recycling Program

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SECTION 00700

STANDARD SPECIFICATIONS

CENTRAL BASIN MUNICIPAL WATER DISTRICT
WEST BASIN MUNICIPAL WATER DISTRICT

The work to be done under this Contract requires the completion of all work in accordance with the Bidding and Contract Requirements herein, and the current edition of the following Standard Specifications, as modified herein.

The Standard Specifications for this project are defined as the Standard Specifications for Public Works Construction, latest edition (Green Book) including all supplements, as written and promulgated by the Joint Cooperative Committee of the Southern California Chapter of the Associated General Contractors of California. Copies of these Standard Specifications are available from the publisher, Building News Incorporated, 10801 National Boulevard, Suite 180, Los Angeles, California 90064, telephone (888) 264-7483.

The Standard Specifications set forth above will control the Bidding and Contract Requirements, construction materials, and construction methods for this Contract except as amended by the plans, Supplemental Standard Specifications or other contract documents. Refer to Sections 00801 and 00802 for the Supplemental Standard Specifications.

The District is not responsible for job site safety. The District will not direct, supervise or lay out the work of the contractor or any subcontractor.

The District and its representatives shall be responsible for their activity and that of its employees on the site. This shall not be construed to relieve the general contractor, or any subcontractor of their obligation to maintain a safe job site. Neither the professional activities nor the presence of the District or its employees and consultants shall be understood to control the operations of others, nor shall it be construed to be an acceptance of the responsibility for job site safety.

The contractor shall, in writing, acknowledge responsibility for the job site safety and acknowledges that the District and its representatives will not have such responsibility and that if the District and its representatives are sued by one of the contractor or subcontractor's employees, or anyone else, that the contractor will indemnify, defend, and hold the District and its representatives harmless of any and all such claims.

SECTION 00801

CONSTRUCTION MATERIALS

SECTION 200 - ROCK MATERIAL

200-2 Untreated Base Materials

200-2.1 General

Amend the first sentence of the second paragraph as follows:

When base material without further qualifications is specified, the Contractor shall supply crushed aggregate base with gradation requirements as specified by the District. The aggregate base shall have a minimum R-value of 80, a minimum sand equivalent of 50, and a minimum durability index of 40.

SECTION 201 - CONCRETE, MORTAR, AND RELATED MATERIALS

201-1 Portland Cement Concrete

201-1.1 Requirements

201-1.1.2 Concrete Specified By Class and Alternate Class

Supplement as follows:

The Contractor is to use the Concrete Class Table 201-1.1.2(A) unless specifically called out on the Plans

201-1.2 Material

201-1.2.1 Portland Cement

Amend the first sentence of the first paragraph as follows:

All cement to be used or furnished, including precast products, shall be either Type II or Type V, conforming to ASTM C150.

201-1.4 Mixing

201-1.4.4 Hand Mixing

Amend as follows:

Hand mixed concrete shall not be allowed, unless otherwise approved by the District.

201-1.6 Prepackaged Unmixed Concrete

Add as follows:

Prepackaged unmixed concrete will be allowed for main installation 12-inches and smaller provided that all requirements of Subsection 201-1 of the Standard Specifications are met.

201-2 Reinforcement for Concrete

201-2.2. Steel Reinforcement

201-2.2.1 Reinforcing Steel

Amend the first sentence as follows:

Reinforcing steel shall conform to ASTM A615, Grade 60 unless otherwise specified on Plans.

201-5 Cement Mortar

201-5.1 General

The first sentence of the fourth paragraph is amended as follows:

Cement mortar shall be used within 30 minutes after mixing with water and shall show no visible signs of setting prior to use.

SECTION 203 - BITUMINOUS MATERIALS

203-5 Emulsion--Aggregate Slurry.

203-5.2 Materials

Item 1 is amended as follows:

Emulsified asphalt shall be slow set type conforming to requirements for SS1h of Subsection 203-1.3, Test Reports and Certification and Subsection 203-3.2, Testing Requirements.

203-5.3 Composition and Grading

Supplement as follows :

The grading of the contained aggregate and the percentage of emulsified asphalt shall be Type I or II per Trench Paving Section Details on the Plans, or as required by the local jurisdictional agency.

203-6 Asphalt Concrete

203-6.1 General

Amend the second paragraph as follows:

Unless otherwise superseded by other jurisdictional agency, permit, or Special Provisions requirements, asphalt concrete shall be class and grade C1-AR-4000 for pavement base course and D1-AR-4000 for final course conforming to the requirements in this section.

SECTION 207 - PIPE

Add the following:

General. Recycled water shall be considered similar to potable water and recycled water supply pipelines and distribution systems will be designed accordingly. Submit design criteria, pipe design calculations, and plans to the District for acceptance prior to ordering pipe and appurtenances. Design calculations shall include all calculations necessary to establish pipe class or thickness and lengths of restrained joints. Plans shall, as a minimum, show pipe size, joint type, thickness or class of pipe and fittings, valve location and size, appurtenances, and lengths of restrained joints.

207-9 Iron Pipe and Fittings

207-9.1 General

Supplement as follows:

Recycled water shall be considered similar to potable water and recycled water supply pipelines and distribution systems will be designed accordingly using ductile iron pipe. Thickness design for ductile iron pipe shall be in accordance with ANSI/AWWA C150/A21.50.

207-9.2 Ductile Iron Pipe for Water and Other Liquids

207-9.2.1 General

Supplement as follows:

Unless otherwise approved by the District, the minimum pressure class for ductile iron pipe shall be Class 200 or as otherwise called out on the Plans.

All ductile iron pipe shall be designed for external loading conditions, laying conditions, and operating and surge pressures, except minimum pressure class for plain end pipe shall be 200 psi. Minimum standard thickness Class 53 shall be used for flanged or grooved end pipe. All pipes shall be designed for minimum live load of HS-20 per AASHTO standard specifications for highway bridges. A bedding angle of no more than 60 degrees shall be used for design.

207-9.2.2 Pipe Joints

Supplement as follows:

All ductile iron pipes laid underground shall have bell and spigot or mechanical joints in accordance with ANSI/AWWA C111/A21.11, unless shown otherwise. Required length of pipe with restrained joints shall be shown on the plans, or shall be determined by the Contractor and approved by the District.

Restrained joints shall be Clow Corp., Super-Lock Joints; American Cast Iron Pipe Co., Flex-Ring Joint or Lok-Ring Joint; or U.S. Pipe, TR-Flex. Megalug or Field Lok gaskets may be used on pipe greater than 12-inch in diameter with prior approval by the District. All other ductile iron pipe shall have flanged joints, unless flexible couplings or other type joints are specifically indicated on the Plans or specified.

The Contractor shall bond all ductile iron pipe joints with bond wires per District's corrosion control Standard Drawings.

207-9.2.3 Fittings

Supplement as follows:

All fittings shall be ductile iron. Fittings shall be designed for the operating and surge pressure, except that the minimum pressure rating shall be 150 psi. Compact body fittings will be permitted in accordance with ANSI/AWWA C153/A21.53 for all sizes between 6-inches and 12-inches in diameter. All fittings shall be made with "push-on" joints designed for use with the type of pipe to be joined, unless otherwise noted on the Plans.

Grooved end fittings shall be ANSI/AWWA C110/A21.10, ANSI/AWWA C606 and ANSI B16.1, radius cut grooved, rigid joint, as manufactured by Victaulic Company, or approved equal. Grooved end pipe couplings shall be malleable iron, ASTM A47, or ductile iron, ASTM A536, Victaulic Style 31, or approved equal. Gaskets for grooved end joints shall be manufacture's flush-seal type specifically designed for cast surfaces. Properties shall be as designated in ASTM D2000 for the required service. Dimensions shall conform to ANSI/AWWA C606.

Flanged fittings shall be ANSI/AWWA C110/A21.10 and ANSI B16.1, faced and drilled 125-pound ANSI standard. Flanges shall be ductile iron, ANSI/AWWA C115/A21.15, threaded, minimum 250 psi working pressure, ANSI 125-pound drilling.

Gaskets for flanged joints shall be 1/8-inch thick, cloth-inserted rubber conforming to applicable parts of ANSI B16.12 and AWWA C207, or approved equal. Gasket material shall be free from corrosive alkali or acid ingredients and suitable for use in potable waterlines. Gaskets are full-face types for 125-pounds FF flange.

Mechanical joint fittings shall be ANSI/AWWA C110/A21.10, ANSI/AWWA C111/A21.11, or may be ANSI/AWWA C153/A21.53 for pipe sizes up to 12-inches in diameter.

Push-on fittings shall be ANSI/AWWA C110/A21.10 and ANSI/AWWA C111/A21.11, American Cast Iron Pipe Company, Fastite Joint; U.S. Pipe and Foundry, Union/Tyler Joint, or approved equal.

Proprietary restrained fittings shall be Clow Corp., Super-Lock Joint; American Cast Iron Pipe Co., Flex-Ring Joint or Lok-Ring Joint; U.S. Pipe and Foundry, TR Flex, or approved equal. Gaskets shall be rubber conforming to ANSI/AWWA C111/A21.11.

207-9.2.4 Lining and Coating

Supplement as follows:

All cement shall be type II unless otherwise specified.

207-9.2.5 Inspection and Certification

Supplement as follows:

All required test reports and certificates of compliance for pipe and fittings shall be provided to the District prior to the shipment of pipe.

207-9.2.6 Polyethylene Encasement for External Corrosion Protection

Supplement as follows:

Unless otherwise called out on the Plans, all ductile-iron pipe, fittings, valves, and appurtenances buried underground shall be protected with two wraps of minimum 8-mil thick polyethylene encasement in accordance with the requirements of ANSI/AWWA C105/A21.5, Installation Method A, using a polyethylene tube for straight pipe and flat sheets for fittings, valves, and other appurtenances.

The polyethylene encasement shall be taped and secured with general purpose polyethylene adhesive tape 2-inches wide. The tape shall be Scotch Wrap 50, Polyken 900, Plus Flex No. 340, Protecto Wrap No. 200, or approved equal.

Add new Subsection as follows:

207-9.2.7 Recycled Water Pipeline Identification

All ductile iron recycled water pipe, fittings, valves, and appurtenances buried underground shall be identified directly on the pipe by one of the following means in accordance with the Standard Drawings:

1. Attach purple colored identification tape with the wording ACAUTION: RECYCLED WATER, DO NOT DRINK@ directly to the top of the DI pipe and polyethylene encasement with plastic adhesive tape in accordance with Section 207-26.13.

2. As an alternative to purple identification tape, the DI pipe may be encased with purple colored polyethylene encasement stenciled with the wording ACAUTION: RECYCLED WATER, DO NOT DRINK@ oriented on top of the pipe in accordance with Section 207-26.13 . Polyethylene encasement shall have a minimum thickness of 8-mil and may be used in place of the second layer of encasement required in Section 207-9.2.6.

207-10 Steel Pipe

207-10.2 Fabricated Steel Pipe

207-10.2.1 General

Supplement as follows:

Steel pipe shall be cement mortar lined and mortar coated in accordance with the requirements of AWWA C205, or cement mortar lined and dielectric coated with mortar rock-shield, in accordance with the requirements of AWWA C214, as directed by the District. Pipe ends shall be tightly closed with a plastic wrap for protection of the cement-motor lining during shipment. The plastic wrap shall consist of a 10-mil sheet of polyethylene plastic and shall remain on the pipe until the time of installation. Damage to the lining or coating shall be repaired, or the damaged section replaced at the expense of the Contractor.

Prior to shipping, furnish and install stulling and bracing with 90-degree spiders with a minimum of two sets of spiders per pipe length. Spiders shall fit tightly and be capable of withstanding backfill loading.

Welded steel pipe, specials, and fittings shall be handled at all times with equipment such as stout wide canvas slings and wide skids designed to prevent damage to welded steel pipe, specials, fittings, linings, and coatings. Bare cables, chains, hooks, metal bars, or narrow skids shall not be permitted to come in contact with the welded steel pipe, specials, and fittings. When shipped by truck or rail, all pipe shall be carefully loaded on cradles or saddles of suitable timbers shaped on the supporting surface and padded to fit the curvature of pipe. Pipe sections shall be separated so that they do not bear against each other, and the whole load shall be securely fastened together and to the cars or trailers to prevent movement in transit.

Patching inserts, overlays, or pounding out of dents in welded steel pipe, specials, and fittings will not be permitted. Repair of notches or laminations on section ends will not be permitted. Damaged ends shall be removed as a cylinder, and the section end properly prepared. Distorted or flattened lengths shall be rejected. A buckled section shall be replaced as a cylinder.

Physical properties and chemical composition of pipe steel shall be determined by tests on steel at the mill and certified for compliance with these specifications, and shall be reviewed by the District prior to fabrication of the pipe.

Records of the Hydrostatic Shop Test for each pipe shall be made and certified copies furnished to the District. Written notice to the District shall be given 48 hours before testing. In lieu of hydrostatic testing to straight pipe sections, radiographic testing of the full length of all butt joint welds in straight pipe sections may be done.

Records of the radiographic testing and repair shall be made and certified copies furnished to the District in lieu of the Hydrostatic Shop Test submittals.

Production welds on factory manufactured pipe shall be tested in accordance with ANSI/AWWA C200, Section 3.3 and test results delivered to the District.

Change the fifth paragraph to read as follows:

Steel plates or sheets used in the manufacture of fabricated steel pipe shall comply with the physical and chemical requirements of ASTM A570, Grades 33, 36, and 40; ASTM A36: or ASTM A572, Grade 42. Wall thickness of pipe shall be based on an allowable design stress of at least 16,500 psi.

207-10.2.2 Design Criteria

Amend the second paragraph to read as follows:

Minimum design pressure for all pipe diameters shall be 200 psi. Steel cylinders shall have a wall thickness of not less than 10 gage (0.135-inch or 3.43 mm) for all pipe diameters.

207-10.2.5 Joints

Supplement as follows:

Spigot rings for bell and spigot joints shall be Carnegie M-3516. The bell ring thickness shall be the same as the steel cylinder, but not less than 3/16-inch. Use Carnegie M-3818 when cylinder wall thickness exceeds 3/8-inch and connect to the pipe cylinder by double fillet welding of the lap joint. For Carnegie spigot and expanded bell, steel wall thickness shall not exceed 5/16-*inch*. Rubber gaskets shall be synthetic rubber.

Restrained joint pipe ends shall be bell-and-spigot for field lap welding. Slip joints shall be long lap joints. The bell depth specified shall be formed by mechanical expansion. Rolling of the bells is not permitted. The bells, after expansion, shall be sized to the required tolerances. The minimum inside radius on either side of the bell slope shall be 15 times the wall thickness of the steel furnished.

Thrust ties shall consist of steel tie bolts extending across the pipe joint to lugs shop welded to the pipe barrel. The joint harness shall be of adequate strength to prevent movement of the joint with 225 psi internal pressure on the pipe. The harness design shall be in conformance with AWWA M11 Steel Pipe Manual. Pipe manufacturers may submit their standard design for joint restraint to the District for review. Submit method of installation for review.

Slip joints shall be provided, as required, at a maximum spacing of 350 feet. Pipe with slip joints shall be marked specially for identification in the field. Both lap and slip joints will be field welded using a fillet weld and a seal weld where shown. The minimum bell depth and stab depth for the lap and slip joint is shown on the Standard Drawings.

The bell depth shall be measured from the outside (end) of the bell to the beginning of the radius at the back of the bell. The stab depth shall be measured from the outside (end) of the bell to the end of the straight end (spigot) when installed. In no case shall the stab depth be more than 1-1/2-inches for lap joints or 4-inches for slip joints. The minimum and maximum stab depth shall be marked on the bell and/or spigot. Deeper or longer bells, with the District's approval, may be furnished at no additional cost to the District, provided that the specified tolerances shall be maintained.

Flanges shall be ANSI/AWWA C207, Class E. Flange shall be furnished in the steel slip-on welding pattern. Flanges shall be faced smooth or may have a serrated finish of approximately 32 serrations per inch, approximately 1/64-inch deep. Serrations may be spiral or concentric. Plate or blind flanges shall have all flange faces machined flat and shall be center drilled and tapped 2-inch I.P.T. 12-inch and larger, and furnished with a standard square head pipe plug.

Final machining on the contact faces of all flanges shall be done prior to being welded to the full length of the adjacent steel plate section. Flange faces shall be checked with a straight edge and shall be perpendicular to the pipeline. All warped flanges will be returned to the pipe company for adjustment. Contractor to be responsible for all additional expenses and delays.

Gaskets for flanged joints shall be cloth-inserted sheet rubber gaskets in one piece conforming to ANSI/AWWA C207 and ANSI B16.21, 1/8-inch thick, or approved equal. The gasket shall be full-face, with holes to pass bolts. Gasket material shall be free from corrosive alkali or acid ingredients. Segmented straight-joint or interlocking gaskets will not be accepted.

Grooved ends shall be ANSI/AWWA C606, Type B, C, or D.

Where mechanical couplings are shown, provide plain ends on pipe and/or special pieces. Plain ends shall be at least 8-inches long, shall have wall thickness not less than specified for special pieces, and shall be such that when the field joint is made, including welds, the joint shall be at least equal in strength to the adjoining pipe section. The outside diameter of the plain end section shall be such that the joint can be coupled with a mechanical coupling. Protect plain ends with at least one coat of Amercoat No. 25. Coating to have a minimum thickness of 2.5 mils.

207-10.2.8 Welding

Supplement the first paragraph as follows:

Field hand welding shall be done by certified welders in accordance with the latest edition of ANSI/AWWA C206.

Supplement the third paragraph as follows:

Production welds on factory manufactured pipe shall be tested in accordance with ANSI/AWWA C200, Section 3.3, and test results delivered to the District.

207-10.4 Protective Lining and Coating for Steel Pipe

207-10.4.1 General

Add the following paragraph:

The surface of exposed pipe shall be prepared by abrasive blast, or centrifugal wheel blast to near white, primed with one coat polyamide, anticorrosive epoxy primer, 2.5 mils minimum dry film thickness; coated with one coat polyamide high-build epoxy, 6 mils minimum dry film thickness; and two coats polyurethane enamel, 3 mils minimum dry film thickness. The surface of embedded piping shall be abrasive blasted or centrifugal wheel blasted to white metal; primed with one coat polyamide, anticorrosive, epoxy primer, 2.5 mils minimum dry film thickness; and two coats coal-tar epoxy, 16 mils minimum dry film thickness.

207-10.4.6 Preparation of Pipe Ends (Lined and Coated Pipe)

Add the following:

The linings and coatings of pipe and fittings to be field welded shall have a holdback minimum of 4-inches and a maximum of 6-inches on each side of field welds. Holdback areas for joints to be field mortared shall be blast cleaned and shop primed with the manufacturer's recommended primer.

The inside joints of pipe 24-inches and larger shall be cleaned and thoroughly wetted before being filled with stiff cement mortar and finished off smooth by troweling, or other equivalent method as approved by the District.

The outside joints of cement-mortar-coated pipe shall be coated with cement-mortar retained by diapers so as to bridge the joint and maintain the specified minimum coating thickness over the joint. The mortar shall be compacted within the diaper to produce a dense coating without voids. The materials and application procedures shall be in accordance with ANSI/AWWA C205. Diapers shall be as manufactured by Mar-Mac Company or equal, Diaper material shall be at least 12-ounce duck.

Outside joints of dielectric coated pipe shall be coated pipe, manufacturer's requirements in accordance with AWWA C214.

Add new Subsection as follows:

207-10.4.7 Fabrication Identification Marking

Each fabricated pipe section or special shall be marked with nontoxic paint on each end both inside and outside the pipe. The minimum size of the lettering shall be 4-inches. The number marking on each spool shall correspond to the Shop Drawings.

Add new Subsection as follows:

207-10.4.8 Recycled Water Pipeline Identification

All steel recycled water pipe, fittings, valves, and appurtenances buried underground shall be identified directly on the pipe by attachment of purple colored identification tape with the wording ACAUTION: RECYCLED WATER, DO NOT DRINK@ directly to the top of the steel pipe with plastic adhesive tape in accordance with Section 207-26.13 and the Standard Drawings.

Add new Subsection 207-25 as follows:

207-25 Polyvinyl Chloride Pressure Pipe (PVC) 4-Inch through 18-Inch

207-25.1 General

These specifications apply to polyvinyl chloride pressure pipe (PVC) for the transmission and distribution of recycled water under pressure. PVC pipe shall be of the size, type, pressure or class shown on the plans or in the specifications. PVC pipe 4-inches and 12-inches in diameter shall comply with ANSI/AWWA C900, Class 200 minimum. PVC pipe greater than 12-inches but less than or equal to 18-inches in diameter shall comply with ANSI/AWWA C905.

207-25.2 Material Requirements

Material used to produce the pipe shall be made from Class 12454-B, rigid polyvinyl chloride compounds, or better, as outlined in ASTM D1784, with an established hydrostatic design basis (HDB) equal to or greater than 4000 psi for water at 73.4 degrees F (23 degrees C), and a wall thickness to a dimension-ratio (DR) series 14.

207-25.3 Joints

Joints for PVC pressure pipe shall be pipe integral bell and spigot joints with elastomeric gaskets, unless noted otherwise. Elastomeric gaskets shall comply with the requirements

specified in ASTM F477. All pipes shall have a home mark on the spigot end to indicate proper penetration when the joint is made.

207-25.4 Inspections and Certifications

All PVC pressure pipe shall be manufactured in strict accordance with the latest revisions of ANSI/AWWA C900 or C905 and the applicable ASTM standards listed therein. The manufacturer shall furnish an affidavit that all delivered materials comply with the requirements of ANSI/AWWA C900 or C905 and these specifications.

207-25.5 Fittings

All fittings for PVC pressure pipe shall be ductile-iron and shall be in accordance with the latest revisions of ANSI/AWWA C110/A21.10 or ANSI/AWWA C153/A21.53, and in accordance with Subsection 207-9. Fittings shall be lined and coated as specified in Subsection 207-9.2.4 and encased with polyethylene in accordance with subsection 207-9.2.6. All fittings shall be restrained joint type or shall be thrust-blocked and anchored in accordance with the Standard Drawings. Bell size shall be for Class 200 cast-iron equivalent PVC pressure pipe, including the rubber-ring retaining groove.

207-25.6 Installation

PVC pressure pipe shall be installed in accordance with AWWA Manual No. M23, "PVC Pipe - Design and Installation" and the manufacturer's installation guide. Pipe shall be bedded in accordance with Subsection 306-1.2.13. Pipe bedding shall provide uniform longitudinal support under the pipe. Pipe bedding material shall be worked under the sides of the pipe to provide satisfactory haunching and be hand tamped to a ninety percent (90%) minimum relative compaction.

207-25.7 Polyvinyl Chloride (PVC) Pipe -1-Inch Through 3-Inch

PVC pipe shall be made from all new rigid unplasticized polyvinyl chloride and shall be Normal Impact (Type I) Schedule 40, unless otherwise shown. Elbows and tees shall be of the same material as the pipe. Unless otherwise shown, joints shall be solvent-welded in accordance with the manufacturer's instructions. Expansion joints or pipe bends shall be provided to absorb pipe expansion over a temperature range of 100 degrees F. PVC pipe shall be approved for recycled water use.

207-25.8 Service Saddles

All service connections to PVC pressure pipe water main shall be constructed with bronze service saddles, double-strap type, with CC threads for receiving a bronze corporation stop in accordance with the Standard Drawings. Service saddles for PVC pressure pipe shall be manufactured to provide full support around the circumference of the pipe and have a minimum width of 2-inches along the axis of the pipe in order to provide full bearing and prevent distortion of the pipe when the saddle is made tight.

Service saddles shall be double strap type as manufactured by the following:

1) Mueller H-13400
2) James Jones J-996

207-25.9 Recycled Water Pipeline Identification

PVC recycled water pipe shall meet the above specifications and shall be colored purple. All such pipe shall be embossed or integrally stamped/marked with black stenciling on opposite sides of the pipe with the wording ACAUTION: RECYCLED WATER, DO NOT DRINK@. Lettering shall be a minimum of 5/8-inches in height and repeated every 12-inches. The purple pipe color shall be achieved by adding pigment to the PVC material as the pipe is being manufactured.

As an alternative to purple colored pipe, PVC recycled water pipe may be installed with purple colored tape attached directly to the top of the pipe or wrapped in polyethylene encasement in accordance with Section 207-26.13 and the Standard Drawings.

207-25.10 Tracer Wire For PVC Pipelines

Copper tracer wire shall be installed with all PVC pipelines, centered and just above the top or crown of the pipe for the purpose of providing a continuous signal path for electronic pipe locators used to determine pipe alignment after installation. The copper wire shall be No. 12 cu. with HMWPE insulation. The wire shall be electrically continuous throughout the entire pipe system including adjacent service line assemblies. At service lines, the wire shall be extended up the pipe and secured by a cable lug under the top nut of one set of bolts. At cul-de-sacs, the wire shall be placed in the same trench with the last lone side service lateral and extended into the meter box. All splices shall be wrapped with PVC tape and the wire shall be tied to the pipe at 10-foot intervals with plastic adhesive tape. Tracer wire shall be extended to surfaces as shown on the Standard Drawings. The Contractor shall provide the District with results of electrical continuity test.

Add new Subsection 207-26 as follows:

207-26 Pipe Appurtenances

207-26.1 General

Unless specified, all appurtenances shall comply with the specifications herein and the appropriate Standard Drawings.

207-26.2 Main Line Valves

207-26.2.1 General

Location, station, size, type of valve, and end connection shall be shown on the Plans.

Valves shall be iron body, non-rising stem, butterfly or resilient wedge disc gate type. All valves shall open by turning the wrench nut counter clock-wise. All valves shall be equipped with O-ring stem seals and shall have mechanical joints or flanged ends or a combination of both.

All valves installed at fittings shall be flanged by mechanical ends with the flange abutting the fitting. All valves shall be provided with a stem extension if depth of valve nut exceeds four feet. All valve extensions shall be centered in the valve well by use of a guide and shall operate freely without binding after installation.

207-26.2.2 Gate Valves-3-Inches and Smaller

Gate valves 3-inches and smaller shall be all-bronze, screwed bonnet and ends, single solid wedge gate, non-rising stem, rated 150-pound SWP, 300-pound WOG and shall be manufactured by one of the following or an approved equal:

1) Stockham: B128
2) Crane Co.; Cat. No. 437

207-26.2.3 Resilient-Wedge Gate Valves

Resilient-wedge gate valves shall conform to the latest revision of ANSI/AWWA C509 and the following:

1) Resilient-wedge gate valves shall be iron bodied with all bronze internal mountings and working parts. Valve stems shall contain no more than five-percent zinc and two percent aluminum.

2) Resilient-wedge gate valves shall have non-rising stems; two O-rings sealed above the thrust collar, with a two-inch square operating nut, opening counterclockwise, and shall be designed for 200 psi working water pressure.

3) Resilient-wedge gate valves shall have sizes and type of ends as shown on the Plans or Specifications.

4) Resilient-wedge gate valve suppliers shall furnish the District with an affidavit of compliance to ANSI/AWWA C509.

5) Resilient-wedge gate valves shall have their internal surface fusion epoxy coated, except stainless steel and rubber surface, as specified in Section 207-26.2.7.

6) Resilient-wedge gate valves shall have the disc 100% encapsulated and completely open at bottom of wedge for drainage.

Resilient wedge gate valves shall be manufactured by one of the following or an approved equal and shall meet all of the above requirements:

1) Mueller Company
2) Clow Corporation
3) M & H Kennedy

207-26.2.4 Butterfly Valves

Butterfly valves shall conform to the latest revision of ANSI/AWWA C504 and the following:

1) Butterfly valves and operators shall be Class 150B constructed for direct burial and have flanged ends unless otherwise specified.

2) Butterfly valves shall be furnished with operators of the traveling nut or worm gear type, self-locking in any position, and sealed, gasketed, and lubricated to withstand a submersion in water to 10 psi. The valve shall be open by counterclockwise rotation of a two-inch square AWWA operating nut. Minimum turns to open 15- to 24-inch valves shall be 35 and minimum turns to open 30- to 42-inch valves shall be 150. Enclose moving parts of valve and operator in housing to prevent contact with the soil. Buried valves shall have extension stems, bonnets, and valve box nuts.

3) The operator shall be capable of meeting the torque requirements for opening and closing the valve against:

   (a) 150 psi upstream and 0 psi downstream; and

   (b) Maximum flow rate of 12 FPS, normal flow rate of 6 FPS, and shall be provided with AWWA stops capable of absorbing up to 250 foot/pounds of input torque at the fully open or fully closed positions without damage to the valve or operator.

4) Butterfly valves shall have seats applied to the body and have a seat surface of stainless steel type 316, monel, Ni-chrome or bronze. All internal mountings or working parts shall be stainless steel. Butterfly valves shall have the shaft's O-ring sealed or Chevron packing. The shaft shall not be exposed between the valve body and the operator.

5) Butterfly valves shall be furnished with records of tests specified in ANSI/AWWA C504. Subsection 2.3 and Section 5. All valves shall be furnished with certified drawings and parts lists of the valve and operator. An affidavit of compliance to ANSI/AWWA C504 shall be furnished for all valves. Five (5) sets of the above information shall be furnished to the District as part of the submittals.

6) Butterfly valves shall have their internal surfaces fusion epoxy coated, except stainless steel and rubber surfaces, in accordance with Section 207-26.2.7.

7) The minimum interior port diameter of the valve shall be one-inch smaller than the nominal diameter of the equivalent pipe. Butterfly valves shall be manufactured by one of the following or an approved equal and shall meet the above requirements:

   (a) Kennedy
   (b) Clow Corporation
   (c) Dezurik
   (d) Pratt
   (e) Mueller

207-26.2.5 Check Valves

Unless otherwise specified, check valves 2-1/2-inches and larger shall conform to the following:

1) Check valves shall be swing type, iron bodied with flanged ends fitted with outside spring and lever.

2) Check valves shall be designed for 150 psi working pressure and a 300 psi test pressure, unless otherwise specified.

3) Check valves shall be functional in both vertical and horizontal position.

4) Check valves shall be fully bronzed mounted and have a stainless steel hinge pin. The disc shall be rubber faced with a bronze seat ring.

5) Check valves 21/2-inches through 12-inches shall be furnished with conventional packing.

6) Check valves shall have their internal surfaces fusion epoxy coated, except stainless steel and rubber surfaces, in accordance with Section 207-26.2.7.

Check valves shall be manufactured by one of the following or an approved equal:

1) Mueller A-2602-6-02
2) Clow F-5340

207-26.2.6 Air-Release and Vacuum-Relief Valves

207-26.2.6.1 General

This section includes materials of air and vacuum valves and air-release valves for water service. All valves shall be combination air release and vacuum valves.

207-26.2.6.2 Materials

Valves are identified on the Plans by size and type. Materials of construction for air-release valves for water service shall be as follows:

Item	Material	Specification
Body and Cover	Cast iron	ASTM A 126, Grade B
Float	Stainless Steel	ISI Type 316, ASTM A 240 or A 276
Linkage, orifice air-release mechanism	Stainless Steel	AISI Type 316, ASTM A 240 or A 276
Needle	Buna-N	

207-26.2.6.3 Valve Design and Operation

Air release and vacuum valves for water service shall have float assembly and large venting orifice to exhaust large quantities of air from pipelines when being filled and to admit large quantities of air when pipelines are being drained. Valve shall have a body with flanged top containing the air-release orifice. The float shall rise with the water level in the valve body to close the orifice by sealing against a synthetic rubber seat. Float shall be protected by a baffle to prevent premature closing and shall withstand an external pressure of 1,000 psig without collapsing. Do not use designs having levers and weights attached to the floats. Float shall have a one-piece guide rod extending out the bottom end to engage the guide bushings in the valve body at all times.

Air release and vacuum valves larger than 4-inches shall have a 1-inch threaded drain outlet with bronze plug near the bottom of the valve body and a 2-inch threaded outlet with bronze plug on the side of the valve body above the minimum water level in the valve which forces the float against the valve seat. The valve outlet shall have a protective steel hood to prevent entry of foreign material.

207-26.2.6.4 Valves

1) Air Release and Vacuum Valves, 1-inch:

   Valves shall be rated for a maximum working pressure of 300 psi. Valves shall be APCO 143C, Crispin UL 10, Val-Matic Model 201C or approved equal.

2) Air Release and Vacuum Valves, 2-inches:

   Valves shall be rated for a maximum working pressure of 300 psi. Valves shall be APCO 145C, Crispin UL 20, Val-Matic Model 202C or approved equal.

3) Air Release and Vacuum Valves, 3-inches:

   Valves shall be rated for a maximum working pressure of 300 psi. Valves shall be APCO 147C, Crispin UL30, Val-Matic 203C or approved equal.

4) Air Release and Vacuum Valves, 4-inches:

   Valves shall be rated for a maximum working pressure of 300 psi. Valves shall be APCO 149C, Crispin UL40, Val-Matic 204C or approved equal.

5) Air Release and vacuum valves shall have their internal surfaces fusion epoxy coated, except stainless steel and rubber surfaces, in accordance with Section 207-26.2.7.

207-26.2.7 Valve Painting and Coating

Metal valves (except bronze and stainless steel valves) located in vaults and structures shall have a zinc prime coat, fusion epoxy (interior of valves only) intermediate and finish coat.

207-26.2.7.1 Surface Preparation

Prime Coat: Self-curing, two-component inorganic zinc rich coating recommended by the manufacturer for overcoating with a epoxy finish coat. Minimum zinc content shall be 14 pounds per gallon. Apply to a thickness of 3 mils. Products: Tnemec N90E92, Porter 311 Zinc-Lock, Ameron Dimetcote 9, or approved equal.

Intermediate and Finish Coat: 100 percent solids, thermosetting or catalytic, fusion bonded, dry powder epoxy, suitable for the intended service as recommended by the manufacturer, Scotchkote 134 or approved equal.

Valves shall be coated on their interior metal surfaces excluding seating areas and bronze and stainless steel pieces. Sandblast surfaces in accordance with SSPC SP-5. Remove all protuberances, which may produce pinholes in the lining. Round all sharp edges to be coated. Remove any contaminants, which may prevent ponding of the lining, Coat the interior ferrous surfaces using one of the following methods:

1) Apply powdered thermosetting epoxy per the manufacturer's application recommendations to a thickness of 10 to 12 mils.

2) Apply two coats of catalytically setting epoxy (Keysite 740, Gilpon, or equal) to a dry film thickness of 10 to 12 mils total. Follow the paint manufacture's application recommendations including minimum and maximum drying time between required coats.

   All epoxy lining shall be fusion epoxy applied by the manufacturer. Coat interior surfaces of cast iron valves at the place of manufacturer. Do not coat seating areas and plastic, bronze, stainless steel, or other high alloy parts.

207-26.3 Main Line Pipe Fittings

207-26.3.1 Flexible Couplings

Unless otherwise specified, flexible couplings shall conform to the following:

1) Each coupling shall consist of one steel middle ring, two steel followers, gaskets, and sufficient numbers of Type 316 stainless steel bolts to compress the gasket without distorting the followers.

2) The thickness of the middle ring shall be such that the stress in the steel shall not exceed 50 percent of the yield point when subjected to the hydrostatic test pressure of the pipeline. The pressure rating shall be no less than the indicated design pressure. The middle ring thickness shall not be less than the thickness of the pipe jointed.

3) Middle rings shall be cold expanded a minimum of one-percent increase in diameter to test the weld and the size of the proper dimension.

4) The middle rings shall be coated with Keysite 740 or District-approved coating to a minimum dry film thickness of 10 mils. Follower rings shall be coated with a compatible shop coat for field coating.

5) Bolts shall be 5/8-inch diameter carriage bolts with hexagon nuts. The steel shall have minimum yield strength of 40,000 psi.

6) Buried coupling shall be coated with fusion bonded epoxy and provided with Type 316 stainless steel bolts and nuts.

7) Provide thrust ties where shown and where required to restrain the force developed by 1-1/2 times the operating pressures specified. Attach thrust ties to steel pipe with fabricated lugs and to ductile iron pipe with socket clamps against a grooved joint coupling or flange.

8) Flexible couplings shall be:

   (a) Baker
   (b) Dresser
   (c) Rockwell
   (d) Ford
   (e) Approved Equal

207-26.3.2 Flanges

Unless otherwise specified, flanges shall conform to the following:

1) Flange size 4-inches through 24-inches shall comply with ANSI/AWWA C207, 150 psi primary service rating.

2) Flange sizes 30-inches through 96-inches shall comply with ANSI/AWWA C207, Class D, 150 psi.

3) Flange sizes 4-inches through 96-inches shall be furnished in the steel slip-on welding pattern.

4) Flanges shall be faced smooth or may have serrated finish of approximately 32 serrations per inch, approximately 1/64-inch deep. Serrations may be spiral or concentric.

5) Plate or blind flanges shall have all flange faces machined fiat and shall be center drilled and tapped 1-inch I.P.T., 4-inch through 10-inch; 2-inch I.P.T. 12-inch and larger: and furnished with a standard square head pipe plug.

6) Final machining on the contact faces of all flanges shall be done prior to being welded to the full-length adjacent steel plate section. Flange faces shall be checked with a straight edge and shall be perpendicular to the pipeline. All warped flanges will be returned to the pipe company for adjustment. Contractor shall be responsible for all additional expenses and delays.

7) Where gaskets are to be furnished. they shall be 1/16-inch minimum thickness, cloth inserted rubber, and full-face gaskets meeting Federal Specification HH-P-151, or approved equal.

8) Nuts and bolts for all underground installations shall be type 316 stainless steeland coated with two coats of 10 Mils each of Carboline Bitumastic No. 50, or approved equal.

207-26.3.3 Insulation Kit/Gaskets

Unless otherwise specified, insulation kit/gaskets shall conform to the following:

1) The insulation gasket shall fit between Class D flanges, 150 psi pressure class.

2) Insulation gaskets shall be full pattern, fabric-reinforced phenolic, neoprene face, 1/8-inch thick.

3) The gasket shall have the following minimum physical characteristics:

   (a) Compression strength - 24,000 psi
   (b) Dielectric strength - 500 V/Mil
   (c) Operating temperature up to 175 degrees F
   (d) Water absorption - 1.6 percent

4) A mylar sleeve and double phenolic washers shall be used for each bolt or cap screw, EN-DW kit or approved equal. The one-piece sleeve and washer shall have the following physical characteristics'

   (a) Sleeve thickness - 1/32-inch
   (b) Washer thickness - 5/32-inch
   (c) Dielectric strength - 1200 V/Mil
   (d) Operating temperature up to 175 degrees F
   (e) Water absorption maximum - 0.22%

5) Flange insulation kits shall be:

   (a) PSI Products, Inc., Burbank, California
   (b) Central Plastics Company, Shawnie, Oklahoma
   (c) CALPICO, Inc., San Francisco, California
   (d) Approved Equal

207-26.4 Copper Pipe and Fittings

When copper pipe is to be furnished, the pipe shall conform to ASTM B88 for Type K hard drawn or soft annealed as shown on the Standard Drawings. When wrought

copper solder-type fittings are shown on the Standard Drawings, the joints shall be soldered with 95/5 non-leaded solder.

When brass or bronze fittings with threaded, copper flare or sweat weld (solder) ends are shown on the Plans or Standard Drawings, the fittings shall conform to ANSI/AWWA C800. Fittings shall be furnished by Mueller, Jones, Ford, or District-approved equal.

207-26.5 Brass Pipe, Nipples, and Fittings

Short threaded nipples, brass pipe, and fittings shall conform to ASTM B43, regular wall thickness. Threads shall conform to ANSI B2.1.

207-26.6 Bronze Appurtenances

All items specified herein shall be manufactured of bronze conforming to ASTM B62.

All services saddle bodies shall be manufactured of bronze and shall be tapped for a C.C. thread. The seal with the pipe shall be effected with either a rubber gasket or an O-ring. All service saddles shall be a double-strap type. The straps (or bails) shall be flat and shall be manufactured of Everdur or Silnic bronze. For PVC pipe use 2-inch wide SS bands instead of bronze bails.

Corporation stops shall be manufactured of bronze. The inlet fitting shall be a male C.C. thread and the outlet connection shall be a flared copper connection. Angle meter stops shall be manufactured of bronze. The inlet connection shall be a flared copper connection and the outlet fittings shall be a meter flange, or meter coupling. The inlet and outlet shall form an angle of 90 degrees on a vertical plane through the centerline of the meter stop. A rectangular lug and lock wing shall be provided on the top of the fitting to operate the shutoff mechanism. Ball (meter) valves shall be manufactured of bronze. It shall have a lever-type turn handle with the inlet being a meter flange or a meter coupling and the outlet female iron pipe.

207-26.6.1 Bronze Flanges

Bronze flanges shall conform to ANSI B16.24, Class 125 or Class 150, to match the connecting flange. Use solder end companion flanges. When both above ground adjoining flanges are bronze, use bronze bolts and nuts. Bolts shall conform to ASTM F468, Grade C65100 or C63000. Nuts shall conform to ASTM F467, Grade C65100 or C63000. When only one of the above ground adjoining flanges is bronze, use Type 316 stainless steel bolts and nuts. Connect to buried ferrous flanges with flange insulation kits. Bolts used in flange insulation kits shall conform to ASTM B193, Grade B7. Nuts shall comply with ASTM A194, Grade 24. If the adjoining buried flange is bronze, use bronze bolts and nuts without a flange insulation kit.

207-26.7 Insulating Bushings and Unions

Pipe or fittings made of non-ferrous metals shall be isolated from ferrous metals by nylon insulating pipe brushings, unions, or couplings as manufactured by Pipeline Coating and Engineering Company, Smith Blair, Pipe Seal and Insulator Company, or approved equal.

207-26.8 Small Steel Pipe

Unless otherwise shown, galvanized steel pipe and black steel pipe in sizes 6-inches in diameter and smaller shall conform to the requirements of the "Specifications for Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless Steel Pipe for Ordinary Uses" (ASTM A 120), and shall be standard weight unless otherwise shown. Galvanized steel pipe shall be wrapped with PVC tape, one half lap. PVC tape shall be 10 mil thickness. Fittings and unions shall be of threaded 150-pound galvanized malleable iron conforming to ASTM A197 with dimensions conforming to ANSI 16.3, unless otherwise shown.

207-26.9 Steel Pipe Casing

Steel casing pipe shall be new and shall be butt-welded steel sheets conforming to ASTM A-570 Grade 30 or of steel plate conforming to ASTM A-233, Grade C. Minimum diameter and thickness shall be as shown on the Standard Drawings. The Contractor may select a greater diameter or wall thickness as convenient for the method of work and loadings involved or as required by the agency having jurisdiction over the road or railroad crossing. Casing selections shall be joined by full circumferential butt welding in the field. Prepare ends of casings for welding by providing l/2-inch by 45-degree chamfer on outside edges. The annular space between the casing and carrier pipe shall be filled with air blown sand. All carrier pipes passing under railroads or freeways shall be restrained. DIP carrier pipe shall have restrained joints while PVC carrier pipe shall be restrained with EBAA Iron Series 1500 retainers or approved equal.

207-26.10 Precast Concrete Vaults

Precast concrete vaults shall comply with ASTM C858, except as modified herein. Design loads shall consist of dead load, live load, impact, and in addition, loads due to water table and any other loads that may be imposed upon the structure. Minimum design live loads shall be for HS20 per AASHTO standard specifications for highway bridges. Minimum design wheel load shall be 16 kips. All vaults located within roadways or driveways shall have traffic covers. Vaults in all other locations shall have parkway covers.

Vault frames and covers shall be fabricated steel and shall be fabricated with supports to resist deflection. Frames and covers shall be galvanized. All covers shall be hinged and have spring or torsion bar assists. All covers shall be equipped with a hold-open mechanism and with bolt down or locking devices. Contractor shall be responsible to

place covers so that the cover is flush with surrounding surface, unless otherwise specified and shall make all necessary adjustments so that the cover meets these requirements. All mortar joints in precast concrete vault section shall be made watertight. The joint sealing compound shall be permanently adhesive flexible plastic material complying in every detail to Federal Specification SS-S-00210.

All voids or openings in the vault walls around pipes shall be filled with 3,000 psi concrete or mortar, using an approved epoxy for bonding concrete surfaces.

207-26.11 Precast Concrete Manholes

Precast concrete manholes shall comply with ASTM C478, except that the wall thickness shall be a minimum of 6-inches with a minimum 4-foot diameter. The minimum allowable steel shall be hoops of No. 4 wire cast into each unit. Street-type manhole frames and covers shall be made of cast iron conforming to ASTM A48, Class 30. Castings shall be smooth, clean, and free from blisters, blowholes, and shrinkage. Frames and covers shall be heavy duty, traffic type, 36-inches clear opening. For 2-inch blowoff specifications are identical but clear opening should be 24". The cover shall seat firmly into the frame without rocking. Grind or otherwise finish each cover so that it will fit in each frame without rocking. Match marked sets of frames and covers prior to shipping. Covers for manholes shall have the word "WBMWD RECYCLED WATER or CBMWD RECYCLED WATER, as applicable, cast thereon in 3-inch high letters, 1/4-thickness and l/4-inch deep. Do not apply any other lettering. Before leaving the foundry, clean castings and subject them to a hammer inspection. Then dip casting twice in a preparation of asphalt or coal tar and oil applied at a temperature or not less than 290 degrees F, nor more than 310 degrees F. Concrete used in manholes and pouring the manhole base shall be Class 560-C-325 or 565-C-3250P per Section 201.

207-26.12 Thrust Blocks and Anchor Blocks

Restrained joints shall generally be used for thrust protection for pipelines over 12-inches in diameter and for thrust protection in street intersections and at locations of utility congestion.

Where used, show location, station, and dimensions of thrust blocks on the Plans.

Concrete thrust and anchor blocks shall be installed at the location and in accordance with the positions and dimensions as shown on the Standard Drawings. The District may direct any change in direction, location or dimension for field conditions or soil conditions that may arise.

207-26.13 Recycled Water Pipeline Identification Tape and Encasement

Recycled water pipeline identification tape shall be a minimum 4 mil thickness, virgin low-density polyethylene, specifically formulated for extended use underground. The tape tensile strength shall be in accordance with ASTM D882 and be not less than 4100

MD and 3650 TD. Elongation properties shall be in accordance with ASTM D882 and be greater than 600% at break point. Tape width shall be 6-inches for 6-inch diameter and smaller pipe and shall be 12-inches for 8-inch diameter and larger pipe. Identification tape shall be colored purple (Pantone 512) with black lettering a minimum of 2-inches in height repeating every 36-inches.

For pipeline identification tape attached to the top of the pipeline, the printed warning message shall read: ACAUTION: RECYCLED WATER, DO NOT DRINK@. Identification tape shall be installed continuously for the entire length of the pipe and shall be properly fastened to each pipe length by plastic adhesive tape banded around the pipe and identification tape at no more than 5-foot intervals. Tape attached to the sections of pipe before laying in the trench shall have 5-foot minimum overlap for continuous coverage.

Purple colored polyethylene encasement may be substituted for identification tape and shall consist of minimum 8 mil thickness low density polyethylene. The printed message shall read: ACAUTION: RECYCLED WATER, DO NOT DRINK@ with minimum 1-inch black letters repeating every 18-inches to 24-inches along the length of the encasement. The printing shall be approximately every 11-inches around the circumference of the encasement for 21-inch and larger encasement. The printing shall be once around the barrel for 16-inch and smaller encasements.

For pipeline warning tape buried 12-inches above the pipe, the printed warning message shall read: ACAUTION: RECYCLED WATER LINE BELOW@.

Identification tape, warning tape and polyethylene encasement shall be as manufactured by T. Christy Enterprises, Griffolyn Co. or approved equal.

207-26.14 Recycled Water Warning Tags

The District requires recycled water warning tags to be installed on all appurtenances in vaults or aboveground, such as, but not limited to, air release valves, blowoff valves, valve boxes, and meters. Recycled water warning tags shall be weatherproof plastic, 3-inch by 4-inch, with purple background and black or white lettering stating "CAUTION: RECYCLED WATER - DO NOT DRINK" on one side and "AVISO: AGUA IMPURA-NO TOMAR" on the other side. Tags shall be attached to each device with a nylon tie wrap. Recycled water warning tags shall be as manufactured by T. Christy Enterprises, Inc., or approved equal.

All recycled water valve boxes for recycled water facilities shall have the inscription "RW - CBMWD OR WBMWD" on the valve box cover.

SECTION 210 - PAINT AND PROTECTIVE COATINGS

210-1 Paint

210-1.5 Paint Systems

Supplement as follows:

For metal surfaces, primer for galvanized surfaces shall be two coats each of Sherwin-Williams "Galvanized Iron Primer", or approved equal. Primer for ungalvanized surfaces shall be two coats each of Sherwin-Williams "Kromik Metal Primer", or approved equal. If no finish paint is to be applied (only where specified), apply two additional coats of the above primers to give a finished dry film thickness of 10.0 mils minimum. Finish paint shall be Sherwin-Williams "Metalastic II", or approved equal. Finished coating thickness shall be 6.0 mils minimum, dry film thickness. Color shall be Pantone 512. Color chips of all finish paints to be used must be submitted to District prior to commencing work.

Piping and fittings in vaults or exposed to the atmosphere shall be field epoxy coated with a minimum total dry film thickness of 13 mils in accordance with ANSI/AWWA C210, except as modified herein. Surface shall be prepared in accordance with SSPC SP-10. The prime coat shall consists of a self-curing, two-component, inorganic zinc-rich coating recommended by the manufacturer for over coating with a high-built epoxy finish coat. Minimum zinc content shall be 14 pounds per gallon. Apply to a minimum thickness of 3 mils. Prime coat shall be Tnemec N90E92, Porter 311 Zinc-Lock, Ameron Dimemote 9, or approved equal. The intermediate and finish coat shall be a high-built epoxy having minimum volume solids of 60 percent. The intermediate and finish coat shall have a minimum thickness of 5 mils each coat. The intermediate and finish coat shall be Tnemec Series 20. porter 7510, Koppers Hi-Guard, Ameron 385 or approved equal.

Add new Subsection as follows:

210-1.8 Concrete Vaults and Manholes

The interior and exterior of concrete vaults and manholes shall be coated with crystalline waterproofing. Crystalline waterproofing shall be cementitious coating containing components that will diffuse into the concrete by water, react with lime, and create an impervious, waterproof, calcified barrier in the substrate. Technical requirements are as follows:

1) Permeability at 2.6×10^{-8} cm/sec (2 coats) minimum per Army COE CRD-C 48-55 or CRD-6 48-73.

2) Compatibility; shall produce no degradation of substrate.

Add new subsection as follows:

210-1.9 Recycled Water Color Coding

It is required that above-ground or exposed facilities be color coded to differentiate recycled water facilities from potable water or wastewater facilities as follows:

Valve Box Covers	Two Coats Purple (Pantone 512)
Air Valves and Piping	Two Coats Purple (Pantone 512)
Blowoffs/Covers	Two Coats Purple (Pantone 512)

In certain instances, the color may be tan; final color shall be verified with the District prior to construction.

*** END OF SECTION ***

SECTION 00802

CONSTRUCTION METHODS

SECTION 300 - EARTHWORK

300-1 Clearing and Grubbing

300-1.1 General

Amend as follows:

The Plans shall show the limits of clearing and grubbing, and designate trees and shrubs to be removed. All other trees and shrubs shall be protected in place, or replaced in kind at Contractor's expense.

300-1.3 Removal and Disposal of Materials

300-1.3.1 General

Add paragraph as follows:

Cleared material shall be disposed of in such a manner as to meet all requirements of state, county, and local regulations regarding health, safety, and public welfare

300-1.3.2 Requirements

Amend paragraph (a) Bituminous Pavement as follows:

Bituminous pavement shall be removed to clean, straight lines. Prior to removal of existing surfacing, pavement cuts shall be made in accordance with the Standard Drawings as specified herein, or as required by local jurisdictional agency. All pavement cuts shall be neat and straight along both sides of the trench or excavation and parallel to its alignment. Where large irregular surfaces are removed, such trimming or cutting shall be parallel to the roadway centerline or right angles to the same.

After backfilling and compaction, final pavement cuts shall be made by sawcutting (unless permit requirements supersede), to a minimum depth of two (2) inches at the location shown in the appropriate trench pavement sections.

300-2 Unclassified Excavation

300-2.2 Unsuitable Material

300-2.2.1 General

Add the following:

Handling of Contaminated Soil. The Contractor shall adhere to the requirements of all federal, state, and local governing agencies, including, but not limited to, OSHA Title 29. Part 1910.120 and Title 8 CCR 5192 (OSHA 40 Hour Hazardous Materials Training) for the handling of contaminated soil. The Contractor shall adhere to the health and safety plan provided by the District's designated hazardous waste representative and employee-training programs shall be submitted to the District prior to commencement of work by the Contractor.

All trenching and excavation operations in the vicinity of known or suspected contaminated soils shall be monitored with a photo ionization detector (PID) or equivalent instrument.

Contractor shall immediately notify the District when suspected or known contamination is about to be encountered or when unknown contamination is encountered.

Suspected or known contaminated soils shall be segregated and stockpiled on site in an area designated by the District and accessible to the District's designated representative for testing, loading, and off-hauling. The Contractor shall supply and install an adequate amount of 6-mil or thicker plastic film under and over all excavated contaminated stockpiles.

The District's designated representative shall perform all testing to determine soils that are contaminated and shall be disposed by the District's designated representative at an approved disposal facility appropriate to the type of contaminants identified.

The Contractor shall be responsible for all employee personal protective equipment as required by all applicable federal, state, and local regulations.

The Contractor shall coordinate with the District's designated representative in areas of suspected or known contaminated soil.

300-4 Unclassified Fill

300-4.7 Compaction

Amend the second paragraph to read as follows:

Each layer of earth fill shall be placed in 8-inch maximum lifts and compacted to obtain a relative compaction of not less than 90 percent as determined by ASTM D-1557, latest revision, or as specified by the Soils Engineer.

SECTION 301 - TREATED SOILS, SUBGRADE PREPARATION, AND PLACEMENT OF BASE MATERIALS

301-1 Subgrade Preparation

301-1.2 Preparation of Subgrade

Supplement as follows:

After the subbase has been prepared, a weed killer shall be applied to the entire subbase surface. Weed killer shall be Poly-Bor-Chlorate as manufactured by Coast Borax Company, Borascu concentrated type as manufactured by Pacific Coast Borax Company, or equal. The weed killer shall be applied according to the manufacturer's published instructions.

301-1.3 Relative Compaction

Amend as follows:

Unless otherwise superseded by other jurisdictional agency, permit requirements, or Special Provisions requirements, subbase shall be compacted to not less than the minimum relative density shown on the applicable trench pavement sections on the Plans or the Standard Drawings, or per the local jurisdictional agency requirements.

SECTION 302 - ROADWAY SURFACING

302-4 Emulsion Aggregate Slurry

Add new subsection as follows:

302-4.7 Final Course

The final course of asphalt concrete pavement shall be slurry sealed with an asphalt emulsion after compaction. The asphalt emulsion shall be Type SS-1h applied at a rate of 0.25 gallons per square yard, in accordance with Subsection 203-3.

302-5 Asphalt Concrete Pavement

302-5.1 General

Supplement as follows:

Unless otherwise superseded by other jurisdictional agency permit requirements or Special Provisions requirements, the minimum asphalt concrete pavement thickness shall be 3-inches placed upon a 6-inch aggregate base. The asphalt concrete shall be placed in two courses: a base course and a final course. The base course shall be constructed 2-inches in thickness to within 1-inch of the existing surface. The final course shall be a minimum 1-inch in thickness over the trench or as directed by the District

The final course of the asphalt concrete pavement shall be fog sealed with an asphalt emulsion after compaction. The asphalt emulsion shall be Type SS-1h applied at a rate of 0.25 gallons per square yard, in accordance with Subsection 203-3.

302-5.3 Prime Coat

Amend as follows:

A prime coat consisting of SC-250 liquid asphalt shall be applied at a rate of 0.25 gallons per square yard. Grade SC-70 liquid asphalt may be used when approved by the District.

SECTION 306 - UNDERGROUND CONDUIT CONSTRUCTION

306-1 Open Trench Operations

306-1.1 Trench Excavation

306-1.1.1 General

Amend the third paragraph as follows:

All excavation shall be considered unclassified and shall include the removal of all water and materials of any nature, including rock, which interfere with the construction work. Removal of groundwater to a level below the structure subgrade is required.

Supplement as follows:

Excavate the trench to the lines and grades shown or as established by the District with proper allowance for pipe thickness and special bedding when required. If the trench is excavated below the required grade, correct any part of the trench excavated below the grade at no additional cost to the District, with 2½-inch minus crushed rock or gravel reasonably well graded from coarse to fine, and free from excessive topsoil or other organic material.

306-1.1.2 Maximum Length of Open Trench

Amend the first paragraph as follows:

The maximum length of open trench shall be limited to that length that will permit pipe installation, compacted backfilling, and placement of temporary pavement at the end of each working day. Plating will be allowed only at the join points for the next day's work (maximum 20-feet), or as required and/or approved by the local jurisdictional agency.

306-1.1.3 Maximum and Minimum Width of Trench

Supplement first paragraph as follows:

For recycled water pipelines, the overall trench width for pipes with diameter of 12-inches or less shall not be more than 16-inches nor less than 12-inches wider than the outside diameter of the pipe barrel (pipe O.D.) to be laid, therein, measured at a point 12-inches above the top of the pipe, exclusive of branches. Excavation and trenching shall be true to line so that the pipe is centered within the trench and a clear space of not more than 8-inches nor less than 6-inches in width is provided on each side of the pipe O.D.

For recycled water pipelines, the overall trench width for pipes with diameters of 14-inches or greater shall not be more than 24-inches nor less than 16-inches wider than the outside diameter of the pipe barrel (pipe O.D.) to be laid, therein, measured at a point 12-inches above the top of the pipe, exclusive of branches. Excavation and trenching shall be true to line so that the pipe is centered within the trench and a clear space of not more than 12-inches nor less than 8-inches in width is provided on each side of the pipe O.D.

306-1.1.5 Removal and Replacement of Surface Improvements

Amend as follows:

For areas with 36-inches or less of asphalt remaining between the edge of the recycled water line trench and the lip of the existing gutter, the existing asphalt shall be removed to the lip of the gutter.

306-1.1.6 Bracing Excavations

Supplement as follows:

Sheet and brace the trench when necessary to prevent caving during excavation in unstable material, or to protect adjacent structures, property, workers, and the public. Increase trench widths accordingly by the thickness of the sheeting. Maintain sheeting in place until the pipe has been placed and backfilled at the pipe zone. Shoring and

sheeting shall be removed, as the backfilling is done, in a manner that will not damage the pipe or permit voids in the backfill. All sheeting, shoring, and bracing of trenches shall conform to the safety requirements of the federal, state, or local public agency having jurisdiction. The most stringent of these requirements shall apply.

Add new Subsection as follows:

306-1.1.7 Removal of Subsurface Obstructions

Remove obstructions within the trench area or adjacent thereto such as tree roots, stumps, abandoned piling, buildings and concrete structures, concrete rubble, logs, and debris of all types without additional compensation. The District may, if requested, make changes in the trench alignment to avoid major obstructions, if such alignment changes can be made within the easement or right-of-way without adversely affecting the intended function of the facility. The Contractor shall pay all additional costs or credit the District for any savings resulting from such alignment changes. Dispose of obstructions removed from the excavation in accordance with Subsection 300-1

Add new Subsection as follows:

306-1.1.8 Location of Excavated Materials

During trench excavation, place the excavated material only within the construction easement, right-of-way, or approved working area. Do not obstruct any traveled roadways or streets. Stockpiling excavated material in landscaped or turf areas will not be permitted. The Contractor shall conform to all federal, state, and local codes governing the safe loading of all trenches with excavated material.

306-1.2 Installation of Pipe

306-1.2.1 Bedding

Add a new paragraph at the beginning of this subsection as follows:

All soft, spongy, and unstable material within bottom of the trench shall be removed to a depth not exceeding 2 feet and, as determined by the District, be replaced with 2½-inch minus crushed rock or river gravel, reasonably well graded from coarse to fine and free from excessive topsoil or other organic material.

Amend the fourth and fifth sentence in paragraph three as follows:

Pipe bedding shall be compacted to a minimum of 90 percent relative density. Densify bedding in the pipe zone by hand or mechanical means prior to backfilling above the pipe zone. The densification method shall provide a uniformly compacted embedment of the pipe. Bedding in the pipe zone may be water densified by jetting, only when the

groundwater table is below the subgrade of the pipe base and the soils are porous and well draining and when approved by the District.

Amend the eighth paragraph as follows:

Special bedding shall be provided for all recycled water pipelines, including PVC, steel and ductile iron pipe (DIP). Bedding shall extend 4-inches below the bottom of DIP less than 14-inches in diameter and 6-inches below all steel, PVC and DIP over 14-inches in diameter. Except as provided in the paragraph below, bedding material for all pipes shall have a minimum SE of 30. Bedding shall be imported sand with 100 percent passing a 3/8-inch sieve and not more than 20 percent passing a 200-mesh sieve.

Two-and-one-half-inch minus crushed rock foundation material shall be placed, when groundwater table is above the bedding subbase and when, in the opinion of the District, the ground is insufficiently stable to support the pipe. The required depth below the grade of the bottom of the pipe will be ordered by the District. The crushed rock foundation material shall be carefully placed and sufficiently compacted by tamping so as to provide support without settlement of the pipe. 3/4-inch maximum crushed rock conforming to Subsection 200-1.2 shall be used from the top of the bedding subgrade to the springline of the pipe.

Cement slurry backfill, if required by the District, shall consist of the one sack (94 pounds) Type II Portland cement added per cubic yard of import sand, except within 6-inches of a buried flexible pipe coupling. In which case, use one-half sack (25 pounds) hydrated lime added per cubic yard of imported sand.

306-1.2.2 Pipe Laying

Supplement as follows:

Unless otherwise specified, all pipes shall be transported, handled, and installed in strict accordance with the manufacturer's recommendations and with approved tools and facilities. Pipe laying shall also conform to the requirements of ANSI/AWWA C905 and C900 for PVC pipe, AWWA M11 for steel pipe, and ANSI/AWWA C600 for ductile iron pipe. Pipe shall not be dropped into trench.

306-1.2.6 Field Jointing of Iron Pipe

Supplement with the following:

Ductile iron pipe and ductile iron fittings shall be installed in accordance with the applicable sections of ANSI/AWWA C600 and as specified herein. Under no circumstances shall pipe or accessories be dropped or dumped into the trench. Under no conditions shall cable, rope, or other devices used for lowering pipe or fittings be attached through the pipe or fittings interior. Combined deflections at rubber gasket or flexible coupling joints shall not exceed 2 degrees or 75 percent of that recommended

by the manufacturer, if smaller. Fittings shall be supported independently of the pipe Until thrust blocks and supports are poured, fittings shall be temporarily supported by placing earth mounds or sandbags under the bells so that the pipe is not subjected to the weight of the fitting. All nut and bolt threads shall be lubricated with oil and graphite, "No-Oxide Grease" or "Never-Seize" prior to installation.

306-1.2.13 Installation of Plastic Pipe and Fittings

Supplement with the following :

PVC pipe construction shall conform to AWWA Manual No. M23, "PVC Pipe - Design and Installation," and the manufacturer's installation guide. Combined deflections at PVC pipe joints with factory-assembled bell couplings shall not exceed 2 degrees or 75 percent of that recommended by the manufacturer, if smaller. All fittings and valves shall be supported so that the pipe is not subjected to the weight of those appurtenances.

Add the following Subsection:

306-1.2.14 Flexible Coupling (All Pipe)

Flexible couplings shall be installed according to the following:

1) Clean each pipe end for a distance of 6 to 8-inches. Remove oil, dirt, loose scale, and rust so that the gaskets will seat on the pipe barrel to provide a positive seal. Wire brushes or non-oily rags may be used, depending on the condition of pipe ends.

2) Slip the follower rings over the pipe ends and slide them back over the cleaned area.

3) Wipe the gaskets clean, immerse them in soapy water or approved gasket lubricant, and slide them over the pipe ends.

4) Clean the coupling middle ring, paying particular attention to flare on the ends where the gasket will seat. Slip the middle ring entirely over one end of the pipe.

5) Position the end of the pipe to be joined to the other pipe such that a 1/2-inch gap is maintained between pipes. Center the coupling middle ring over the gap.

6) Lubricate the pipe and the flares of the middle ring with soapy water or gasket lubricant. Slide the gaskets and followers into place making sure the gaskets are pushed under the middle ring flare all the way around.

7) Insert the bolts. Nuts should be run on with the rounded or chamfered edge toward the follower ring.

8) Wrenching should be done progressively, drawing up the bolts on opposite sides a little at a time and returning to retighten until all bolts have a uniform tightness. During wrenching it is advisable to strike the follower rings with a hammer occasionally to make sure they are seating properly.

Torque application shall be in accordance with the manufacturer's recommendations.

306-1.3 Backfill and Densification

306-1.3.1 General

Delete the seventh paragraph and replaced with the following :

Rocks greater than 3-inches in any dimension will not be permitted in backfill placed between 1 foot above the top of any pipe or box and the bottom of pavement subgrade.

306-1.3.2 Mechanically Compacted Backfill

Supplement the first paragraph by adding the following:

Impact, free fall, or stomping equipment shall not be used for backfill compaction until at least 3 feet of cover is placed over the top of the pipe.

306-1.3.3 Jetted Backfill

Amend as follows:

Water densification of backfill by means of flooding or jetting will not be allowed, except as permitted, in writing, by the District for designated areas. In areas where densified backfill is permitted, it shall be in accordance with the unamended Subsection 306-1.3.3 or as directed by the District.

306-1.3.6 Mechanical Compaction Requirements

Amend as follows:

Delete 1) 85-percent relative compaction:

Insert 1) 90-percent relative compaction:

Except as specified otherwise, trench backfill shall be compacted as required by the permitting agency but in no case less than 90-percent relative compaction.

All pipe and backfill shall be compacted to the minimum relative compaction. Compaction testing will be provided by the District.

306-1.4 Testing Pipelines

306-1.4.1 General

Supplement as follows:

The testing requirements for recycled water pipelines shall be as indicated for water pipelines herein.

306-1.4.5 Water Pressure Test

Supplement as follows:

C = 0.25 for PVC with elastomeric gasket joints
C = 0.25 for DIP and steel with push on joints

It is the responsibility of the Contractor to obtain all water for filling and testing and to remove excess water from the project area. The Contractor is responsible for any damages as a result of testing operations.

The new pipeline shall be swept clean and/or rinsed by hand, as directed by the District, to remove dirt, silt, mud, and any other foreign material from inside the pipeline prior to filling and pressure testing. The Contractor may clean pipelines by flushing with clean water. It is the Contractor's responsibility to obtain and dispose of all flushing water. Pipeline flushing velocity shall not be less than 2.0 ft/sec.

All tests shall be done in the presence of the District. The Contractor shall notify the District not less than forty-eight (48) hours in advance of the actual time of testing so that the District may observe the procedure. All blowoffs, combination air valves, services, and appurtenant facilities shall be tested with the main line pipe.

When the pressure test fails to meet the requirements of the specifications, the Contractor shall make necessary repairs, replacements, or repetition of procedures to conform to the specified requirements at his own expense.

Before testing, the backfill material shall have been compacted to the required compaction to the ground surface. All concrete anchor and thrust blocks shall be allowed to cure sufficient time to develop adequate resistance to thrust developed during testing (minimum three days).

The Contractor shall assume all responsibility for locating leaks and repairing damage to the pipe bedding, backfill, and pavement section resulting from leaks discovered during the pressure test or subsequent pipe failures.

All noticeable leaks shall be stopped regardless of the results of the test and all defective pipes, fittings, valves, and other accessories discovered in consequence of the test shall be removed and replaced. Repair clamps of any kind or type shall not be allowed.

The pump, pipe connection, water, water meter, measuring devices, gauges, and all other equipment, labor, and materials required for performing the leakage test shall be furnished by Contractor. The District may, however, use District's measuring device in place of Contractor's equipment. In case of a difference in the measured leakage rate between the measuring devices, the District's measured leakage shall govern.

The test pressure shall be applied by means of a pump connected to the pipeline in a manner approved by the District. The time duration of the pressure test for different nominal diameter pipeline systems shall be as follows:

Time	Pipe Diameter
4 hours	18-inch diameter pipelines and smaller·

The test pressure shall be maintained for the duration of the test. Whenever test pressure falls an amount of 5 psi, it shall be restored. The Contractor may, at his convenience, conduct a preliminary test at any time prior to the District's pressure test. The results of the preliminary test will not be considered by the District.

The test pressure for all pipelines shall be 200 psi as measured at the lowest elevation of the pipeline under test, or as directed by the District. No pipeline shall be tested at less than 200 psi unless authorized, in writing, by the District.

The amount of pipeline footage to be tested at one time shall be determined by the District. The leakage test shall be held concurrently with the pressure test.

Each section of the pipeline to be tested shall be slowly filled with water from the nearest source by means approved by the District. The pipelines shall be filled with water and placed under a light pressure for at least twenty-four (24) hours before the pressure test.

All air shall be vented from all high spots in the pipeline before making any pressure test. If hydrants or other outlets are not available, taps shall be made at the high points to expel the air by the Contractor at his own expense. These taps shall be capped after testing.

All valves shall be tested for leakproof tightness after the mainline pressure test with the test pressure on one side of the valve and atmospheric pressure on the other side.

Add new subsection as follows:

306-9 Recycled Water Pipeline Installation

306-9.1 Connection to Existing Recycled Water Lines

306-9.1.1 General

All connections shall be made in the presence of the District and no connection work shall proceed until the District has given notice to proceed. The Contractor shall furnish all pipe, materials, equipment, and labor required to make the connection, as well as assist the District in alleviating any hardships occurred during the shutdown for connections. Standby equipment or materials may be required by the District. The District may postpone or reschedule any shutdown operation if, for any reason, the District believes that the Contractor is improperly prepared with competent personnel, equipment, or materials to proceed with the connection work. If progress is inadequate during the connection operations to complete the connections in the time specified, the District shall order necessary corrective measures. All costs for corrective measures shall be paid by the Contractor. The District will operate all existing valves. The Contractor shall dewater existing mains, as required, in the presence of the District. The Contractor shall be aware that existing valves (if present) may leak and that the installation of connections may be made under wet conditions. All valves, existing and newly installed, shall be readily accessible at all times to the District for emergency operations.

Contractor shall notify the District a minimum of 10 working days prior to the date of connection. The Contractor shall be responsible for determining in advance the grade, station, and offset of the existing pipelines prior to laying the last 100 feet of the new pipeline. The Contractor, upon approval from the District, shall make necessary cut-to-fit changes, adjusting line and grade as necessary. Where the changes create a high or low point in the pipeline profile, a standard combination air release or blowoff assembly shall be installed if directed by the District. In no event shall the new pipelines be connected to existing facilities until the new pipelines have been successfully pressure tested and flushed.

306-9.1.2 Tapping Sleeves and Valves

Tapping valves shall conform to all requirements for gate valves and the additional requirements listed herein. One end of the tapping valve shall have slotted bolt holes to fit all standard tapping machines. Seat rings shall be oversized to permit the use of full-size cutters. Tapping sleeves shall be Mueller H-615 mechanical joint tapping sleeve, or approved equal. Gaskets shall be Buna-N rubber with a wide cross section. All bolts and nuts shall be stainless steel (316 SS) and coated with two coats of Carboline Bitumastic No. 50. Double nuts shall be provided on all sleeve bolts. Tap size on existing pipeline shall be minimum one size less and located a minimum of 5-feet from a joint, collar or service. The tapping sleeve shall be installed in accordance

with manufacturer's instructions and to the satisfaction of the District. The pipe barrel shall be thoroughly cleaned with a wire brush to provide a smooth, hard surface for the sleeve. The sleeve shall be pressure tested in the presence of the District prior to tapping. Thrust blocks shall be provided at the tapping sleeve.

306-9.2 Valve Installations

306-9.2.1 General

1) The Plans shall show the station, size, type, and end condition of all main line valves. The Standard Drawings show such information for appurtenant installations.

2) The Contractor shall install the valves at the locations shown on the Plans and on Standard Drawings.

3) Valves shall be installed in a level position with the operating stem vertical, except where shown on the Plans.

4) Butterfly valves operators shall be located on the left-hand side of the valve when standing on the flanged end of the valve (at the tee or cross) and looking through the valve toward the pipe end. Otherwise, the operator shall be installed on the street centerline side of the pipeline.

5) The Contractor shall coat all buried bolts with two coats of Carboline Bitumastic No. 50, or an approved equal. Wrap buried valves with two wraps of 8-mil polyethylene wrap per ANSI/AWWA C105.

6) Valves shall be stabilized and supported separately from the pipeline, as shown on the Plans or on the Standard Drawings.

7) Main line and appurtenant valves shall be tested for leak-proof tightness after the main line pressure test, at the test pressure.

8) The Contractor shall install valve boxes at all valve locations, except where shown otherwise on the Plans.

9) Valve location ties shall be made by the Contractor and shall be measured from the valve to two locations. One set of Plans shall be marked with the tie locations and dimensions and submitted to the District upon completion of the work.

10) Tie locations shall be a chiseled "V" on the curb or a white 4-inch by 4-inch witness post set at the property line, or as required by the District.

306-9.2.2 Valve Box Installations

1) The Contractor shall install valve box cap and rim, sleeves, and valve operator extensions of the type indicated in the Standard Drawings at each valve location shown on the Plans.

2) Operator extensions and sleeves shall be centered and set plumb over the valve operator nut.

3) Operator extensions, where required, shall be fitted with an AWWA 2-inch square operating nut and a tapered socket end for the valve operating nut.

4) Operator extension shaft, nut, socket, and centering guide shall be painted with one coat of zinc chromate primer after fabrication.

5) The valve box caps shall be set flush with finished pavement surface.

6) The valve box cap shall be painted with two coats of purple paint according to the requirements of Section 310.

306-9.3 Blowoff Assemblies

306-9.3.1 General

1) The Plans shall show the outlet station, size, direction, and location of the outlets.

2) The Contractor shall install blowoff installations at the location shown on the Plans and in accordance with Standard Drawings.

3) The piping between the outlet valve and the riser shall be at a continuous downgrade of not less than 1/4-inch per foot.

4) Where blowoffs are placed in sidewalk areas, the sidewalk shall be saw cut and removed to the nearest score line. The cover shall be set to sidewalk grade and the sidewalk replaced.

5) Where blowoffs are placed in unpaved areas, the cover and rim shall be set at the existing ground surface or as directed by the District.

306-9.4 Combination Air Release and Vacuum Valve Assembly

306-9.4.1 General

1) The Plans shall show the outlet station, size, direction, and location of the combination air valve assembly.

2) The Contractor shall install combination air release and vacuum valve assembly installations at the location shown on the Plans and in accordance with Standard Drawings.

3) The piping between the outlet valve and the elbow on the air valve riser shall be at a continuous up grade of 1/4-inch per foot.

4) The long axis of the valve shall be set parallel to the street.

5) The exposed vent pipe and guard posts, where used, shall be painted according to the requirements of Section 310.

6) The number and position of guard posts, when required shall be shown on the Plans or Standard Drawings.

7) The tap for the combination air valve shall be made in a level section of the pipe no closer than 18-inches to a bell, coupling, joint, or fitting.

306-9.5 Service Installations

1) The Plans shall indicate the recycled water service station, size, direction, and location of the meter box.

2) The Contractor shall install recycled water services at the locations shown on the Plans and in accordance with Standard Drawings.

3) The Contractor may open cut or bore service laterals as approved by the District.

4) Splicing of copper pipe for 1-inch services is not allowed.

306-9.6 Precast Vault, Manhole, and Meter Box Installation

1) The Plans or Standard Drawings shall show the station, location, and size of the installation.

2) The Contractor shall install precast vaults and manholes at the locations shown on the Plans or Standard Drawings.

3) Reinforcement steel shall be Grade 40 or Grade 60 billet steel conforming to ASTM A-615 and shall be deformed according to ASTM A-305.

4) Concrete for vaults or meter boxes shall use Type II cement, and shall develop a minimum strength of 3,250 psi at 28 days in conformance to ASTM C-150. All course and fine aggregate shall conform to ASTM C-33.

5) Concrete for vault and manhole footings shall be Type II 450-C-2000. and poured against undisturbed or well-compacted soil to the dimensions shown on the Plans or Standard Drawings.

6) Manholes

(a) Fill joints between precast sections with dry pack crystalline waterproofing plus an outside gun grade elastomeric sealant. The entire manhole shall be waterproof. After backfilling is completed and dewatering is stopped the Contractor shall check for any leakage. All leakage shall be repaired by the Contractor.

(b) Set each precast concrete manhole unit plumb on a bed of drypack crystalline to make a watertight joint at least 1-inch thick with the concrete base or with the preceding unit. Point the inside joint and wipe off the excess sealant. Secure the manhole frame to the grade ring with grout and cement mortar fillet. Backfill and compact and replace pavement.

(c) Assemble units so that the cover conforms to the elevation determined by the manhole location as follows:

(1) In Paved Areas: Top of cover shall be flush with paving surface.

(2) In Shoulder Areas: Top of cover shall be flush with existing surface where it is in traveled way of shoulder and 0.1 foot above existing surface where outside limits of traveled way but not in the existing roadside ditch.

(d) Backfill and compact around the manholes per Section 300 and pipe specification Section 306.

7) Coat interior and exterior of manholes and vaults with crystalline waterproofing per Section 210. The interior surface of the walls and roof shall be coated white. The exterior walls shall be coated gray.

306-9.7 Concrete for Thrust Blocks, Anchors and Pipe Cradles

306-9.7.1 General

1) Concrete thrust blocks, anchors, or pipe cradles shall be poured at the locations and with the dimensions shown on the Standard Drawings.

2) Portland Cement concrete Type II 450-C-2000 shall be poured against undisturbed soil and shall make positive contact with the pipe with a minimum thickness of 12-inches.

3) Sandbags may be used to provide form works for thrust blocks or anchors unless otherwise specified.

4) Concrete shall be placed such that bell ends of fittings shall be available for repairs. Concrete placed over joints shall be removed.

5) Reinforcing steel exposed directly to the soil shall be coated Carboline Bitumastic No. 50, or approved equal.

306-9.8 Recycled Water Pipeline Identification

All buried PVC, DIP and steel recycled water pipelines shall be identified directly on the pipe by one of the following means as specified in the Standard Drawings:

For PVC Pipe:

1. Purple colored pipe marked with the wording ACAUTION: RECYCLED WATER, DO NOT DRINK@ on opposite sides of the pipe in accordance with Section 207-25.9.

2. As an alternative to purple colored pipe, purple identification tape with the wording ACAUTION: RECYCLED WATER, DO NOT DRINK@ may be attached directly to the top of the PVC pipe with plastic adhesive tape in accordance with Section 207-26.13.

3. As an alternative to the two options described above, encase PVC pipe with purple colored polyethylene encasement with the wording ACAUTION: RECYCLED WATER, DO NOT DRINK@ in accordance with Section 207-26.13.

For DI Pipe:

1. Attach purple colored identification tape with the wording ACAUTION: RECYCLED WATER, DO NOT DRINK@ directly to the top of the DI pipe and polyethylene encasement with plastic adhesive tape in accordance with Section 207-26.13.

2. As an alternative to purple identification tape, encase DI pipe with purple colored polyethylene encasement with the wording ACAUTION: RECYCLED WATER, DO NOT DRINK@ in accordance with Section 207-26.13.

For Steel Pipe:

1. Attach purple colored identification tape with the wording ACAUTION: RECYCLED WATER, DO NOT DRINK@ directly to the top of the steel pipe with plastic adhesive tape in accordance with Section 207-26.13.

In addition to the above identification requirements, all PVC, DIP and steel buried recycled water pipelines shall have purple colored warning tape placed in the trench 12-inches

above the pipe with the wording "CAUTION: RECYCLED WATER LINE BELOW" in accordance with Section 207-26.13 and the Standard Drawings.

SECTION 310 - PAINTING

310-1 General

310-1.5 Painting Schedule

Add as follows:

Item	Color	No. of Coats
Valve Box Covers	Purple	2
Air Valve Blowoff Valves	Purple	2
Vault Covers (Top)	Zinc Chromate Primer Aluminum	1
Vault Covers (Underside)	Carboline Bitumastic No. 50	2
Piping and Valves (In Vault)	Tnemec 66	2
Guard Posts	Safety Yellow	2
Aboveground or Exposed Pipe	See Section 310-6.5	---

Add new Subsection as follows:

310-6 Protective Coatings (Ferrous Metals)

310-6.1 General

The Contractor shall furnish all material, labor, and equipment necessary to line and coat all piping, valves, fittings, pipe hangers, and other ferrous metal surfaces not shop lined and coated.

310-6.2 Surface Preparation

All ferrous surfaces to receive protective coatings shall be sandblasted to commercial standards per Subsection 310-2.5 of the Standard Specifications prior to the application of coatings. All surface irregularities such as weld spatter, sharp corners, rough welds, etc.,

shall be ground smooth. All surfaces shall be completely free of grease, oil, and other foreign material.

310-6.3 Interior of Ferrous Surfaces

The interior surfaces of iron pipe and fittings shall be cement lined in accordance with the latest revised edition of ANSI/AWWA C104.

310-6.4 Buried Exterior of Ferrous Surfaces

310-6.4.1 Field Coat

All buried ferrous metal fittings and joints (valves, couplings, flanges, etc.) in contact with the soil shall be coated with one (1) coat of Super Tank Solution or Carboline Bitumastic No. 50 after assembly to the main line pipe, or approved equal.

310-6.4.2 Polyethylene Encasement

All ductile iron pipe, fittings, and valves shall be encased with two wraps of minimum 8-mil polyethylene sheeting in accordance with ANSI/AWWA C105/A21.5.

310-6.5 Above Ground or Exposed Pipeline

Pipelines which will be above ground or permanently exposed to the environment will be prepared and coated using a Zinc Rich Primer/Epoxy/Urethane coating system as follows:

310-6.5.1 Preparation

Surfaces may be shop primed and coated or field coated. Preparation of metal surfaces shall be in accordance with the manufacturer's recommendations and in accordance with SSPC SP-10, "Near White Blast Cleaning".

Coated surfaces damaged during shop priming or installation shall be prepared and recoated in accordance with the coating manufacturer's recommendations and these specifications.

310-6.5.2 Coating System

The coating system shall be a 3-coat system as follows, or approved equal:

1) Primer: Tnemec; Series 90-97, "TnemeZinc," Zinc Rich Urethane Primer - 3 mils.

2) Intermediate: Tnemec; Series 66, "Hi-Build Epoxoline," Epoxy - Polyamide Coating - 4 mils.

3) Finish: Tnemec: Series 1075 "Endura-Shield II", Hi-Build Acrylic Polyurethane Enamel -4 mils.

310-6.5.3 Inspection

1) Shop primed or factory finished items shall be inspected at the job site before further painting or coating. Areas of chipped, peeled, or abraded coating shall be hand or power sanded, feathering the edges, then spot primed and coated in accordance with these requirements.

2) Contractor shall provide scaffolding and testing equipment to permit inspection.

3) Color shall be selected by the District's representative from submitted paint samples of the manufacturer's standard colors

New Subsection added as follows:

310-7 Waterproofing (Concrete)

310-7.1 General

The Contractor shall furnish all material, labor and equipment necessary to waterproof the interior and exterior of all manholes and vaults.

310-7.2 Surface Preparation

1) Do not treat concrete surfaces with chemical hardeners or curing agents prior to the application of waterproofing.

2) Examine surfaces to be waterproofed for form tie holes and structural defects, such as honeycombing, rock pockets, faulty construction joints, cracks, etc. Repair these areas in accordance with Section 303.

3) Concrete surfaces shall have an open capillary system to provide tooth and suction and shall be clean, free from scale, form oil, latency, curing compounds, and any other foreign matter. Lightly sandblast, water blast, or acid etch with muriatic acid (15% to 20%) to provide a clean absorbent surface. Saturate surfaces to be acid etched with water prior to application of acid. Vertical surfaces may have a sacked finish. Do not apply a slurry coat of water materials to horizontal concrete deck surfaces that are less than 20 hours old.

4) Use light sandblasting or etching to remove the surface glaze of dense or steel troweled concrete.

5) Abrasive clean and wash construction joints.

310-7.3 Application

1) After completing repairs, apply a top-coat system to the concrete surfaces to be treated, apply after curing and finishes are complete. Application of waterproofing and any paint top coatings shall conform to the manufacturers recommended application procedures.

2) The Contractor shall have the manufacturer's representative advise and/or supervise the waterproofing application in person.

3) Apply crystalline waterproofing material to concrete, which has been thoroughly saturated with clean water. Moisten surfaces to be treated prior to application. Remove free water prior to application of waterproofing material.

4) Apply crystalline waterproofing to:

   (a) Interior walls and roof of concrete vaults and manholes. Exterior walls of concrete vaults and manholes.

   (b) Joints of precast concrete manholes as shown on the Plans.

   (c) The interior surfaces shall have a white color and the exterior a gray color.

5) Apply second coat when the first coat has reached an initial set. Use light water spray on surfaces to be coated if rapid drying occurs.

310-7.4 Backfilling

1) Do not backfill against structures for at least seven days after application of waterproofing.

2) Prior to backfilling, check treated surfaces for newly developed cracks. Repair cracks and cure surface for 48 hours before backfilling. Do not backfill with dry material until after complete cure of coating.

*** END OF SECTION ***

DEFINITIONS

Whenever the following words, phrases, or pronouns used in their place, occur in these Standard Specifications, or in any documents that these Standard Specifications govern, the intent and meaning shall be interpreted as follows:

Air-Gap Separation: A physical break between a supply pipe and a receiving vessel. The air gap shall be at least double the diameter of the supply pipe, measured vertically above the top rim of the vessel, and in no case less than one inch.

Approved Backflow Preventer: A device installed to protect the Potable Water supply from contamination by Recycled Water, such as Treated Wastewater. This device shall be approved by the SDHS and the Distributor in conformance with Title 17.

AWWA: The American Water Works Association.

AWWA Guidelines: American Water Works Association Guidelines for Distribution of Nonpotable Water, California-Nevada Section, latest edition.

AWWA Standards: American Water Works Association Standards for Construction Materials, latest edition.

CBMWD: Central Basin Municipal Water District.

Contractor: A Person(s) or firm entering into a legal agreement with a Supplier, Distributor, Owner, or User for the performance of Work on all or any portion of facilities subject to these Specifications.

Discharge Permit: A permit issued by the Los Angeles RWQCB for the Discharge of Recycled Water.

District: The West Basin Municipal and Central Basin Municipal Water Districts.

Inspector: Any Person(s) authorized to perform inspection of either onsite or Offsite Facilities prior to construction, during construction, after construction and during operation.

Off site Facilities: Existing or proposed facilities under the control of the Supplier or Distributor, from the source of supply to the point of connection with the User's Onsite Facilities, normally up to and including the Distributor's meter and meter box.

Onsite Facilities: Existing or proposed facilities within property under the control of the User, normally downstream of the Distributor's meter.

Owner: Any holder of legal title, contract purchaser, or lessee under a lease with an unexpired term of more than one (1) year, of property for which Recycled Water Service has been requested or established.

Pantone: Color standard system.

Plans: The plans, working drawings, detail drawings, profiles, typical cross sections and supplemental drawings or reproductions thereof which show locations, character, dimensions or details of the Work.

Recycled Water: As defined in Title 22, Division 4, Chapter 3, of the California Code of Standard Specifications, water which as a result of treatment of wastewater, is suitable for direct beneficial use or a controlled use that otherwise would not occur. The treatment of wastewater is accomplished in accordance with the criteria set forth in the code.

Service: The furnishing of recycled water to a user through a metered connection to the onsite facilities.

Service Connection: The facilities between the Recycled Water distribution system and the customer's Recycled Water Service valve, including, but not limited to, the meter, meter box, valves, and piping equipment.

Standard Specifications: Specifications adopted by the District for construction of water and recycled water facilities.

SDHS: State Department of Health Services.

User: Any Person, group, firm, partnership, corporation, association or agency accepting Recycled Water from the Distributor's Recycled Water facilities for use in accordance with these Standard Specifications.

Work: The entire improvement proposed to be constructed pursuant to a legal agreement and consistent with these Standard Specifications.

WBMWD: West Basin Municipal Water District.

ABBREVIATIONS

List of General Abbreviations

A	Area
AASHTO	American Association of State Highway and Transportation Officials
AB	Anchor Bolt/Aggregate Base
ABAN	Abandoned
ABC	Asphalt Base Course
ABT	About
AC	Acre/Asphaltic Concrete
ACI	American Concrete Institute
ACP	Asbestos-Cement Pipe
ADDL	Additional
AHD	Ahead
AI	The Asphalt Institute
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AL	Aluminum
ALIGN	Alignment
ALTN	Alternate
ANCH	Anchor
ANG	Angle
ANSI	American National Standards Institute
APPROX	Approximate
APWA	American Public Works Association
ARCH	Architecture/Architectural
AREA	American Railway Engineering Association
ARV	Air-Release Valve
ARVV	Air-Release/Vacuum Valve Abbreviation Term
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASPH	Asphalt
ASSY	Assembly
ASTM	American Society of Testing and Materials
AVE	Avenue
AVG	Average
AWG	American Wire Gauge
AWS	American Welding Society
AWWA	American Water Works Association
BC	Beginning of Curve
BCR	Begin Curb Return
BEG	Begin
BETW	Between

BF	Blind Flange
BK	Back
BL	Base Line
BLDG	Building
BLK	Block
BM	Bench Mark/Beam
BO	Blowoff
BOCA	Building Officials Code Administration International, Inc.
BOT	Bottom
BRG	Bearing
BUR CBL	Buried Cable
BV	Butterfly Valve
BVC	Begin Vertical Curve
BW	Block Wall
C	Conduit
CAB	Crushed Aggregate Base
CALTRANS	California Department of Transportation
CAP	Capacity
CATV	Cable Television
CB	Catch Basin
C-C	Center-to-Center
CCB	Concrete Block
CCP	Concrete Cylinder Pipe
CD	Cross Drain
CEM	Cement
CF	Cubic Feet/Curb Face
CFH	Cubic Feet Per Hour Abbreviation Term
CFM	Cubic Feet Per Minute
CFS	Cubic Feet Per Second
C & G	Curb and Gutter
CHG	Change
CHKD PL	Checkered Plate
CI	Cast Iron
CIP	Cast in Place/Cast-Iron Pipe
CISP	Cast Iron Soil Pipe
CISPI	Cast-Iron Soil Pipe Institute
CJ	Construction Joint
CL	Centerline/Class/Clearance
CLR	Clear
CMC	Cement-Mortar Coated or Coating
CML	Cement-Mortar Lined or Lining
CMLCSP	Cement-Mortar Lined and Coated Steel Pipe
CMP	Corrugated Metal Pipe
CMPA	Corrugated Metal Pipe Arch
CMU	Concrete Masonry Unit

CO	Cleanout/Conduit Only
COL	Column
COMPL	Complete
CONC	Concrete
CONN	Connection
CONST	Construct or Construction
CONT	Continuous
CONTR	Contractor
COORD	Coordinate/Coordinated
COP	Copper
COR	Corner
CPLG	Coupling
CRES	Corrosion Resistant Steel
CRSI	Concrete Reinforcing Steel Institute
CS	Carbon Steel/Commercial Standard
CSP	Corrugated Steel Pipe
CT	Center Top
CTG	Coating
CTR	Center
CTV	Cable Television
CULV	Culvert
CU YD,	CY Cubic Yard
CYL	Cylinder
D	Degree of Curvature
DB	Direct Buried
DBL	Double
DEPT	Department
DET	Detail/Detour
DI	Drop Inlet/Ductile Iron Abbreviation Term
DIA	Diameter
DIM	Dimension
DIMJ	Ductile-Iron Mechanical Joint
DIP	Ductile-Iron Pipe
DIPRA	Ductile-Iron Pipe Research Association
DISCH	Discharge
DIST	Distance
DMH	Drop Manhole
DN	Down
DR	Drain/Door
DWG	Drawing
DWY	Driveway
E	East
EA	Each
EC	End of Curve

ECC	Eccentric
ECR	End of Curb Return
ED	External Distance
EE	Each End
EF	Each Face
EFF	Efficiency
EFL	Effluent
EGL	Energy Grade Line
EL	Elevation
E/L	Easement Line
ELEC	Electric
ELEV	Elevation
ELP	Elliptical
ENC	Encasement
ENCL	Enclosure
EOP	Edge of Pavement
EOS	Equivalent Opening Size
EP	Edge of Pavement
EPA	Environmental Protection Agency (Federal)
EQ	Equation
EQL	Equal
ESMT	Easement
EST	Estimate or Estimated
ETC	And so Forth
EVC	End Vertical Curve
EW	Each Way
EXC	Excavate or Excavation
EXP	Expansion
EXST	Existing
EXT	Exterior/Extension Abbreviation Term
F	Fahrenheit/Floor
FAB	Fabricate
FCO	Floor Cleanout
FCV	Flow Control Valve
FD	Floor Drain
FE	Flanged End
FF	Finished Floor/Flat Face
FG	Finished Grade
FHY	Fire Hydrant
F&I	Furnish and Install
FIG	Figure
FIN	Final
FIT	Fitting
FL	Floor/Flow Line
FLG	Flange

FM	Force Main/Factory Mutual
FNSH	Finish
FPC	Flexible Pipe Coupling
FPM	Feet Per Minute
FPS	Feet Per Second
FPT	Female Pipe Thread
FS	Finished Surface/Federal Specifications
FT	Feet or Foot
FTG	Footing
FUT	Future
FWY	Freeway
G	Gas
GA	Gauge
GAL	Gallon
GALV	Galvanized
GB	Grade Break
GDR	Guard Rail
GE	Grooved End
GENL	General
GM	Gas Main
GND	Ground
GPD	Gallons Per Day
GPM	Gallons Per Minute
GR	Grade
GRTG	Grating
GSKT	Gasket
GUT	Gutter
GV	Gate Valve Abbreviation Term
HARN	Harness
HB	Hose Bibb
HD	Heavy Duty
HDPE	High Density Polyethylene
HGL	Hydraulic Grade Line
HGT	Height
HORIZ	Horizontal
HP	High Pressure
HPT	High Point
HR	Hour/Handrail
HS	High Strength
HV	Hose Valve
HVY	Heavy
HW	Headwall
HWL	High Water Level
HWY	Highway

HYDR	Hydraulic
I	Intersection Angle Officials
ID	Inside Diameter
IE	Invert Elevation
IN	Inches
INCL	Include
INL	Inlet
INS	Insulating
INSTL	Install or Installation
INTR	Interior/Intersection
INV	Invert
IP	Iron Pipe
IPS	Iron Pipe Size
IPT	Iron Pipe Thread
IRR	Irrigation
JCT	Junction
IN	Join
JT	Joint
KIPS	Thousands of Pounds Abbreviation Term
L	Length of Curve/Long/Left
LATL	Lateral
LB	Pound
LF	Linear Foot
LG	Long
LOC	Location/Locate
LP	Light Pole
LPT	Low Point
LR	Long Radius
LS	Lift Station
LT	Left/Light
LWL	Low Water Level
MATL	Material
MAX	Maximum
MB	Machine Bolt
MECH	Mechanical
MFR	Manufacturer
MG	Million Gallons/Milligram
MGD	Million Gallons Per Day
MH	Manhole
MI	Malleable Iron/Mile
MIL	Military Specifications

MIN	Minimum
MISC	Miscellaneous
MJ	Mechanical Joint
MOD	Modification
MON	Monument
MPT	Male Pipe Thread
MSL	Mean Sea Level
MSS	Manufacturer's Standardization Society
N	North
NA	Not Applicable
NBFU	National Board of Fire Underwriters
N & C	Nail and Cap
NC	Normally Closed
NE	Northeast
NIC	Not in Contract
NIP	Nipple
NO	Number/Normally Open
NOM	Nominal Abbreviation Term
NPT	National Pipe Taper
NRS	Nonrising Stern
NTS	Not to Scale
NW	Northwest
NWL	Normal Water Level
OA	Overall
OC	On Center
OD	Outside Diameter
OE	Or Equal
OF	Outside Face
OPNG	Opening
OPP	Opposite
ORIG	Original
OSHA	Occupational Safety and Health Administration
OVFL	Overflow
P	Pole
PC	Point of Curvature
PCA	Portland Cement Association
PCC	Point of Compound Curvature/Portland Cement Concrete
PE	Plain End/Polyethylene/Professional Engineer
PI	Point of Intersection
PKWY	Parkway
PL	Plate/Property Line
PLF	Pounds Per Lineal Foot
POB	Point of Beginning

POC	Point of Connection
POJ	Push-On Joint
PP	Power Pole/Polypropylene
PRC	Point of Reverse Curve
PRESS	Pressure
PRL	Parallel
PROV	Provisions
PRPSD	Proposed
PRVC	Point of Reverse Vertical Curve
PSI	Pounds Per Square Inch
PSIG	Pounds Per Square Inch Gauge
PSF	Pounds Per Square Foot
PT	Point of Tangency
PV	Plug Valve
PVC	Polyvinyl Chloride Abbreviation Term
PVMT	Pavement
Q	Flow Rate
QTY	Quantity
R	Right/Radius
RC	Reinforced Concrete
RCP	Reinforced Concrete Pipe
RCPA	Reinforced Concrete Pipe Arch
RD	Road
ROC	Reduce
RDCR	Reducer
REF	Reference
REINF	Reinforce or Reinforced
RELOC	Relocated
REQ	Required/Requirement
REQD	Required
RF	Raised Face
RND	Round
RJ	Restrained Joint
RPM	Revolutions Per Minute
RR	Railroad
RST	Reinforcing Steel
RT	Right
RW	Recycled Water
R/W	Right-of-Way
S	South/Slope in Feet Per Foot/Sewer
SAN	Sanitary
SCHED	Schedule
SO	Storm Drain

SDG	Siding
SDWK	Sidewalk
SE	Southeast
SECT	Section
SF	Square Feet
SGL	Single
SH	Sheet/Sheeting
SIM	Similar
SLP	Slope
SLV	Sleeve
SOL	Solenoid
SOV	Solenoid-Operated Valve Abbreviation Term
SP	Steel Pipe
SPCG	Spacing
SPEC	Specification
SPLC	Splice
SPRT	Support
SQ	Square
SQ FT	Square Feet
SR	Short Radius
SS	Sanitary Sewer
SSPC	Steel Structures Painting Council
SST	Stainless Steel
ST	Street
STA	Station
STD	Standard
STK	Stake
STL	Steel
STR	Straight
STRL	Structural
STRUCT	Structure
SURF	Surface
SW	Southwest
SYMM	Symmetrical
SYS	System
T	Tangent Length of Curve/Telephone
TAN	Tangent
TB	Top of Bank
T & B	Top and Bottom
TBG	Tubing
TBM	Temporary Bench Mark
TC	Top of Curb
TDH	Total Dynamic Head
TEL	Telephone
TEMP	Temperature/Temporary

THB	Thrust Block
THD	Thread or Threaded
THH	Thrust Harness
THK	Thick
T/O	Top of
TOC	Top of Concrete
TOS	Top of Slab
TOT	Total
TP	Telephone Pole
TV	Television
TYP	Typical Abbreviation Term
UBC	Uniform Building Code
UD	Underdrain
UG	Underground
UL	Underwriters' Laboratories, Inc.
UNO	Unless Noted Otherwise
UTC	Underground Telephone Cable
V	Vent/Valve/Volt
VC	Vertical Curve
VCP	Vitrified Clay Pipe
VEL	Velocity
VERT	Vertical
VOL	Volume
VPC	Vertical Point of Curve
VPI	Vertical Point of Intersection
VPT	Vertical Point of Tangency
W	West/Wide/Water
W/	With
WL	Waterline
WLD	Welded
WM	Water Meter
W/O	Without
WSE	Water Surface Elevation
WT	Weight
WTR	Water
WWF	Welded Wire Fabric
WWM	Woven Wire Mesh
YD	Yard
YR	Year
YS	Yield Strength

APPENDIX C:

CALIFORNIA WATER SERVICE CO. STANDARD DRAWINGS

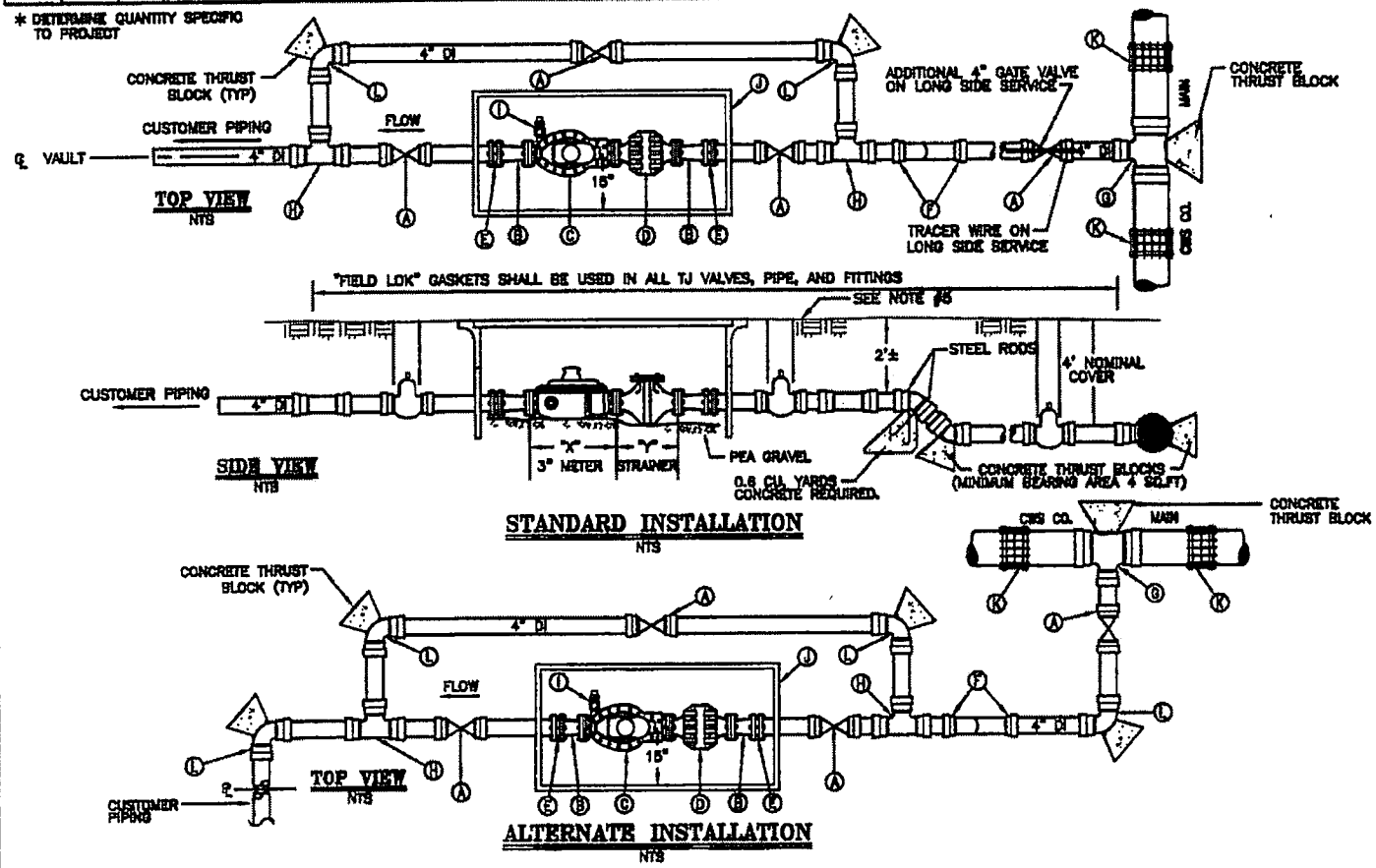
MATERIALS:		
KEY	QTY.	ITEM
A	3 (*)	4" GATE VALVE PO, W/ FIELD LOK GASKETS, (ADDITIONAL GATE VALVE FOR LONG SIDE SERVICE)
B	2	4" x 3" REDUCER, CI CL, FLG (USE WITH "MEGAFLANGE")
C	1	3" METER, PROVIDED BY C.W.S. CO.
D	1	3" STRAINER, PROVIDED BY C.W.S. CO.
E	2	4" MEGAFLANGE RESTRAINED FLANGE ADAPTOR
F	2	4" ELL 45° PO CL DI, W/ FIELD LOK GASKETS
G	1	MAIN SIZE" x 4" TEE PO CL DI, W/ FIELD LOK GASKETS
H	2	4" TEE PO CL DI, W/ FIELD-LOK GASKETS
I	1	2" BALL VALVE F.I.P. THREAD, 360 DEGREE ROTATION, MUELLER 300 B-20283-3 FORD B11-777R, A.Y. McDONALD 6101, JONES J-1900W OR MILWAUKEE BA100 W/ 2" x 12" BRASS NIPPLE AND BRASS PLUG (SEE NOTE 11).
J	1	OUTSIDE FULL TRAFFIC AREAS, 30" x 48"x 18" DEEP POLYMER CONCRETE METER BOX WITH ONE 18" EXTENSION AND SPLIT COVER ARMORCAST (A6001430APCX18, BOX) (A6001470, SPLIT COVER, SOLID) AND (A6001470DZ, SPLIT COVER, WITH READING LID).
		IN FULL TRAFFIC AREAS 30"x 48" CONCRETE BOX, BROOKS NO. 55, OR CHRISTY B48 WITH TWO EXTENSIONS AND SPLIT COVER WITH READING LID. IF METER BOX IS LOCATED IN CONCRETE OR PAVED AREA, THEN A STEEL 2 PIECE COVER WITH READING LID IS REQUIRED.
–	*	4" "FIELD LOK" GASKET (PLUS GASKETS FOR ADDITIONAL PIPE FITTINGS, OR VALVES)
–	*	4" DUCTILE IRON PIPE, CLASS 350 PO
K	2	COUPLING OR SLEEVE FOR TIE-IN, IF EXISTING MAIN
L	2 (*)	4" ELL 90° PO CL DI, W/ FIELD-LOK GASKETS (ADD 2 FOR ALTERNATE INSTALLATION)
M	1	4.80" x 2" CC SADDLE, DOUBLE STRAP (MATERIAL PER NOTE 8)
N	1	2" BALL CORPORATION VALVE, 2" CC x 2" M.I.P. MUELLER B-2998, FORD FB400-7, A.Y. McDONALD 31488 OR JONES J-1944, W/ 2 BRASS COUPLINGS, 2" x 12" BRASS NIPPLE AND BRASS PLUG (SEE NOTE 11)

METER AND STRAINER LENGTHS			
	3" METER		3" STRAINER
MAKE	LENGTH X		LENGTH Y
	COMPOUND	TURBO	
SCHLUMBERGER	17"	12"	6"
INVENSYS	17"	12"	7"
BADGER	17"	12"	7"

NOTES:

1. ALL FLANGES TO BE 125 LB. STANDARD DRILLING.
2. ITEMS Ⓒ & Ⓓ PROVIDED BY C.W.S. CO. WITH ONE SET OF BOLTS, NUTS, & GASKET.
3. BACKFLOW PREVENTION ASSEMBLIES SHALL BE DOWNSTREAM OF SERVICE INSTALLATION.
4. CENTER METER BOX OVER METER AND STRAINER, SEE PLAN VIEW.
5. ALL VALVES OUTSIDE THE CONCRETE BOX REQUIRE VALVE CASING & COVER PER DWG. CW14 AND CW439.
6. ALL UNDERGROUND M.I. BOLTS, NUTS, AND BARE STEEL SHALL BE PROTECTED BY METALGUARD GREASE AND BIT WRAP PER THE C.W.S CO. PROTECTION COATING STANDARD.
7. SEE DRAWING CW435 FOR TYPICAL THRUST BLOCK INSTALLATION.
8. SADDLE MATERIAL SHALL BE BRONZE WITH P.V.C. PIPE AND IRON WITH D.I. PIPE. MANUFACTURERS AND MODELS SHALL BE PER STD. 2" SERVICE CONN. DWG. CW-436.
9. SEE DRAWING CW-850 FOR TRACER WIRE INSTALLATION.
10. A MINIMUM OF 5 PIPE DIAMETERS OF STRAIGHT RUN PIPE OR FULL OPEN FLOW COMPONENTS (STRAINER, FULL OPEN GATE VALVES, BYPASS TEES OR CONCENTRIC REDUCERS) IS RECOMMENDED UPSTREAM OF THE METER.
11. INSTALL 2" x 12" BRASS NIPPLE WITH BRASS BALL VALVE AND BRASS PLUG (I) INTO METER TEST PORT. IF METER DOES NOT HAVE A TEST PORT, INSTALL 2" x 12" BRASS NIPPLE, COUPLINGS, NIPPLE AND BRASS PLUG (N) INTO A 2" SADDLE (M) DOWNSTREAM OF THE METER. (INSIDE THE METER BOX)

* DETERMINE QUANTITY SPECIFIC TO PROJECT



ENGINEERING DEPARTMENT

CALIFORNIA WATER SERVICE CO.

TITLE:

STANDARD 4" SERVICE CONNECTION FOR 3" METER WITH STRAINER

DISTRICT:	DATE:	SCALE:	PROJECT ID.:	PLAT NO.:
ALL	9/28/87	NONE		

DRAWN BY:	CHECKED BY:	APPROVED BY:	DWG. NO.:
A.L.G.	D.T.D.	1/29/03	CW-785-R10

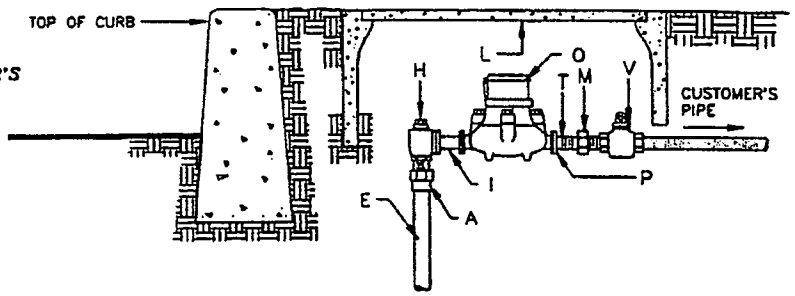
REVISION: R10 – UPDATE MATERIALS, ADD TURBO METER / 4" BYPASS 12/23/02

	DATE:	INIT.
DISTRIBUTION MAP	☐	
ZONE MAP	☐	
PLAT MAP	☐	
STATION SCHEMATIC	☐	
SYSTEM SCHEMATIC	☐	
VALVE RECORD	☐	
AS BUILT	☐	

NOTES:

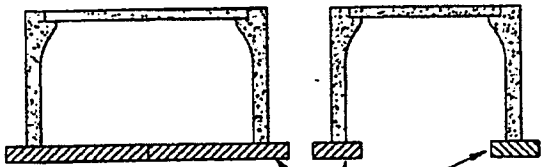
1. *2" SERVICE SHALL BE INSTALLED FOR ALL 1-1/2" METERS.*
2. *A SADDLE SHALL BE USED FOR ALL 2" SERVICES.*
3. *THIS INSTALLATION SHALL BE USED WHEN CUSTOMER'S VALVE IS A GREAT DISTANCE FROM METER, OR CUSTOMER'S PIPING IS UPHILL FROM THE METER, OR PREFERRED INSTALLATION REQUIRES VALVE ON CUSTOMER'S SIDE OF METER.*

2" SERVICE WITH 1-1/2" METER



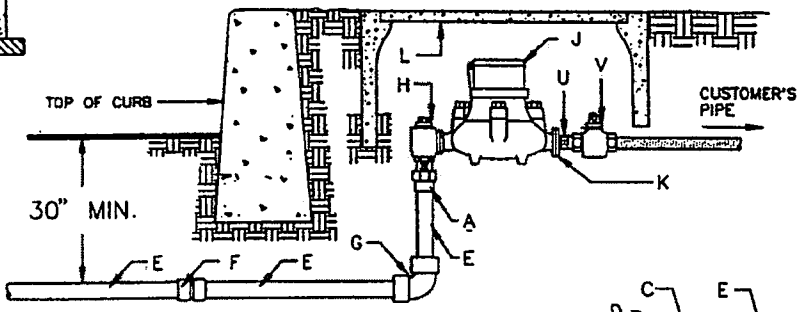
SIDE VIEW METER BOX

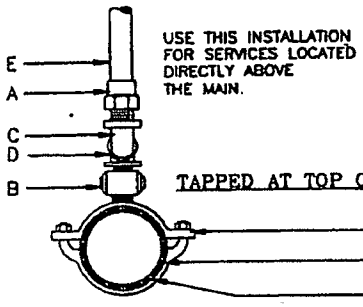
FRONT VIEW METER BOX



WHEN REQUIRED BY CWS COMPANY, PLACE BRICKS ON TWO SIDES OF METER BOX FOR SUPPORT. (OR 2" x 4" PRESSURE TREATED LUMBER)

2" SERVICE WITH 2" METER

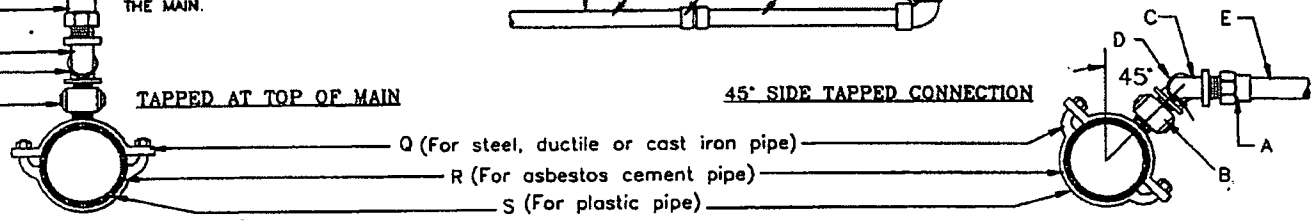




USE THIS INSTALLATION FOR SERVICES LOCATED DIRECTLY ABOVE THE MAIN.

TAPPED AT TOP OF MAIN

45° SIDE TAPPED CONNECTION



MATERIAL REQUIREMENTS	
PART	DESCRIPTION
A	2" ADAPTER C TO I.P.T. MALE STREAMLINE
B	CORPORATION STOP-MT MUELLER H-10003 1-1/2" CCx2" M.I.P., OR -FORD FB-800 1-1/2" CCx2" M.I.P. OR, JAMES JONES J-89 1 1/2" CC x 2" M.I.P.
C	2" ELL STD. BRASS 90° (F.I.P. x F.I.P.)
D	2" ELL STREET STD. BRASS 90° (F.I.P. x M.I.P.)
E	2" TUBING COPPER, TYPE "K", SOFT
F	2" COUPLING C TO C STREAMLINE
G	2" ELL C TO C STREAMLINE 90°
H	2" BALL ANGLE METER VALVE - F.I.P. x METER FLANGE - FULL PORT MUELLER B-24286, FORD BFA13-777W, JAMES JONES J-1974 W.
I	METER FLG. ADAPTER, FORD A67-2" MET. FLG. x 1-1/2" MET. FLG.
J	2" METER, (BY CWS COMPANY) LENGTH 17" NOTE: DEVELOPER'S CONTRACTOR SHALL INSTALL SPACER IN PLACE OF METER, PER CWS CO.'S DIRECTION.
K	2" METER FLG. (FLG. x F.I.P.) BRONZE WITH FULL FACE GASKET AND #304 STAINLESS STEEL BOLTS & NUTS.
L	BOX, METER: (FOR 1-1/2" AND 2" METER) 17" X 30" NOMINAL - BROOKS CONCRETE #66 BOX W/ #66S CONCRETE COVER & LID CHRISTY CONCRETE B36 BOX W/ B36E CONCRETE COVER & LID NOTE: CAST IRON COVERS REQUIRED IN TRAFFIC AREAS.

MATERIAL REQUIREMENTS	
PART	DESCRIPTION
M	BUSHING BRASS 2" M.I.P. x 1-1/2" F.I.P.
O	1-1/2" METER, (BY CWS COMPANY) LENGTH 13" NOTE: DEVELOPER'S CONTRACTOR SHALL INSTALL SPACER IN PLACE OF METER, PER CWS CO.'S DIRECTION.
P	1-1/2" METER FLG. (FLG. x F.I.P.) BRONZE W/ FULL FACE GASKET AND #304 STAINLESS STEEL BOLTS & NUTS
Q	SADDLE, MALLEABLE IRON, DOUBLE STRAP, MUELLER H-10500, FORD F202, JAMES JONES, ROCKWELL INT'L.
R	SERVICE SADDLE, ALL BRONZE, DOUBLE STRAP, FORD 202B STYLES, OR JAMES JONES J-979, OR ROCKWELL INTERNATIONAL NO. 323, MUELLER H-16000.
S	SERVICE SADDLE, ALL BRONZE, JAMES JONES J-996, FORD METER BOX CO. S-90 STYLES, OR MUELLER #H-13400 SERIES
T	1-1/2" X CLOSE NIPPLE STD. BRASS
U	2" x CLOSE NIPPLE STD. BRASS
V	2" BALL VALVE, F.I.P. BOTH ENDS. 360 DEG. TURN, MUELLER B-20283-3, OR FORD B11-777-R, OR JAMES JONES J-1900-

ENGINEERING DEPARTMENT

CALIFORNIA WATER SERVICE CO.

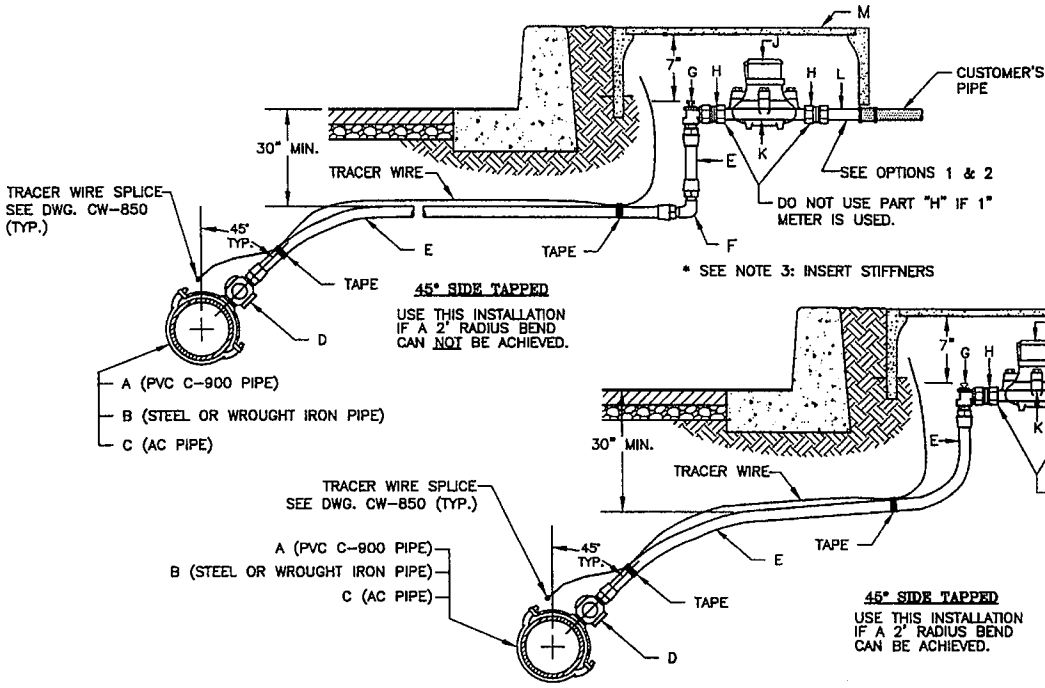
TITLE:

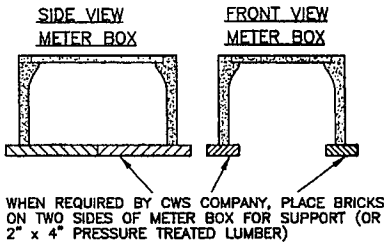
2" SERVICE CONNECTION WITH 2" METER and 1-1/2" METER (WITH ADDITIONAL VALVE ON CUSTOMER'S SIDE OF METER)

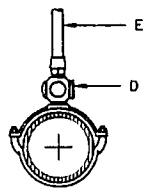
DISTRICT:	DATE: 6/12/92	SCALE: NONE	EST. NO.:	PLAT NO.:

DRAWN BY:	CHECKED BY:	APPROVED BY:	DWG. NO.:
A.I.G.	A.F.G.	Alita Thomas Goodrich	CW-848-R1

REVISION: R1. Changed to Angle Meter Valve and 17" x 30" Box for 2" Meter and 1-1/2" Meter. A.I.G. 6/30/94







TAPPED AT TOP OF MAIN

USE THIS INSTALLATION ONLY WHEN METER BOX IS LOCATED DIRECTLY ABOVE THE MAIN.

NOTES:

1. ALL PE PLASTIC PIPE REQUIRES TRACER WIRE TAPED TO PE PIPE AND EXTENDED INTO METER BOX PER LATEST REVISION OF DWG. CW-850 AND AS SPECIFIED IN CWS CO. MATERIAL SPECIFICATIONS DWG. CW-832.
2. SADDLES ARE REQUIRED ON ALL PVC C-900, AC, STEEL, OR WROUGHT IRON PIPE.
3. INSERT STIFFNERS SHALL BE USED ON ALL PE PIPE WITH COMPRESSION CONNECTIONS.
4. WHEN USING MUELLER INSTA-TITE, BEVEL THE PE PIPE WITH MUELLER'S BEVELING TOOL PER MANUFACTURER'S SPECIFICATIONS.
5. RESPONSIBILITY FOR SERVICE MAINTENANCE BY CWS CO. ENDS AT DOWNSTREAM METER COUPLING (OR LEFT TO DISTRICT'S DISCRETION).

OPTIONS: THESE OPTIONS MAY BE REQUIRED BY CWS CO.

1. EXTEND CUSTOMER'S PIPING ±12" BEYOND METER BOX WITH TWO 12" NIPPLES & TWO 90° ELLS, BRASS (OR GALVANIZED IF PREFERRED BY CWS). SEE NOTE 5.
2. INSTALL BALL VALVE DOWNSTREAM FROM METER WHEN CUSTOMER'S PIPING IS UPHILL FROM METER OR CUSTOMER'S VALVE IS A GREAT DISTANCE FROM METER.
3. INSTALL 1" COPPER TUBING, TYPE K SOFT, INSTEAD OF PE WHEN CWS REPRESENTATIVE DETERMINES THAT CONDITIONS ARE UNFAVORABLE TO PE.

										IN FULL TRAFFIC AREAS		OUTSIDE FULL TRAFFIC AREAS
PART LETTER	PART NAME	PART SIZE	MUELLER INSTA-TITE	MUELLER COMPR.	FORD	JAMES JONES	A.Y. McDONALD	SMITH-BLAIR	APAC	BROOKS	CHRISTY	ARMORCAST
A	SERVICE SADDLE ALL BRONZE	NOMINAL MAIN SIZE x 1" CC	H-13400 SERIES	H-13400 SERIES	S90 SERIES	J-996 SERIES	3805 SERIES	393 SERIES	------	------	------	------
B	SERVICE SADDLE DUCTILE IRON	NOMINAL MAIN SIZE x 1" CC	DR 2A SERIES	DR 2A SERIES	F202 SERIES	------	------	313 SERIES	102 SERIES	------	------	------
C	SERVICE SADDLE ALL BRONZE	NOMINAL MAIN SIZE x 1" CC	BR 2 B SERIES	BR 2 B SERIES	202B SERIES	J-979 SERIES	3825 SERIES	323 SERIES	------	------	------	------
D	CORPORATION STOP (BALL)	1" CC x 1" MFG. F/PE IPS	B-25005 OR 20045 + 15426	B-25009 OR 20045 + 15429	FB1001-4-Q	J-1938-SGP	4701B-3Q ⚠3	------	------	------	------	------
E	1" PE PLASTIC PIPE	1" PE PLASTIC PIPE IPS	HIGH DENSITY POLYETHYLENE PIPE, IRON PIPE SIZE, AWWA STANDARD C901, PE 3408, PC 200, IDR7						------	------	------	------
F	1" 90° ELBOW	1" MFG F/PE IPS	H-15464	ELL BRASS FIP w/TWO H-15429	L66-44-G	J-2610-SGP	4761-3Q ⚠3	------	------	------	------	------
G	ANGLE METER STOP (BALL)	1" x 1" x 1"	B-24266	B-24259	BA63-444W-Q	J-1962W-SGP	4602B-3Q ⚠3	------	------	------	------	------
H	METER ADAPTER	1" PIPE TO 5/8" x 3/4" METER	H-10879	H-10879	A24	J-128-H	10J24	------	------	------	------	------
J	METER	BY CWS COMPANY: 5/8" x 3/4" METER (USE FOR LOT SIZE < 10,000 SQ. FT) LENGTH 7 1/2". 1" METER (USE FOR LOT SIZE 10,000 SQ. FT. OR LARGER OF IF REQ'D TO MEET CITY'S FIRE SPRINKLER ORDINANCE) LENGTH 10"							------	------	------	------
K	METER SPACER	DEVELOPER'S CONTRACTOR SHALL INSTALL SCH. 80 PVC NIPPLE IN PLACE OF METER: 1-1/4" DIAMETER, 11" LONG WITH IPT							------	------	------	------
L	METER COUPLING	1" METER SWIVEL NUT x M.I.P.	H-10890	H-10890	C38-44-2.625	J-134	4624	------	------	------	------	------
M	METER BOX	12" x 20" x 12"	------	------	------	------	------	------	------	#37 BOX WITH CAST IRON COVER	#B12 BOX WITH CAST IRON COVER	P6000485-ROTOCAST BOX w/A6000484DQ COVER & DROP-IN LID A6000487 CWS OPTION: 1-PIECE COVER A6000484

ENGINEERING

CALIFORNIA WATER SERVICE CO.

DEPARTMENT

REVISIONS:
R13 Changed part no. under A.Y. McDonald from "I" to "9" 2/12/03

PLAT SHEET:

SCALE: N.T.S.

DRAWN BY: M.SETTERQUIST

DESIGNED BY:

CHECKED BY: DATE:

APPROVED BY: DATE: 2/19/03

TITLE: STANDARD 1" SERVICE CONNECTION FOR 5/8" x 3/4" AND 1" METERS

DISTRICT:

DATE: 4/25/01

ESTIMATE NO.:

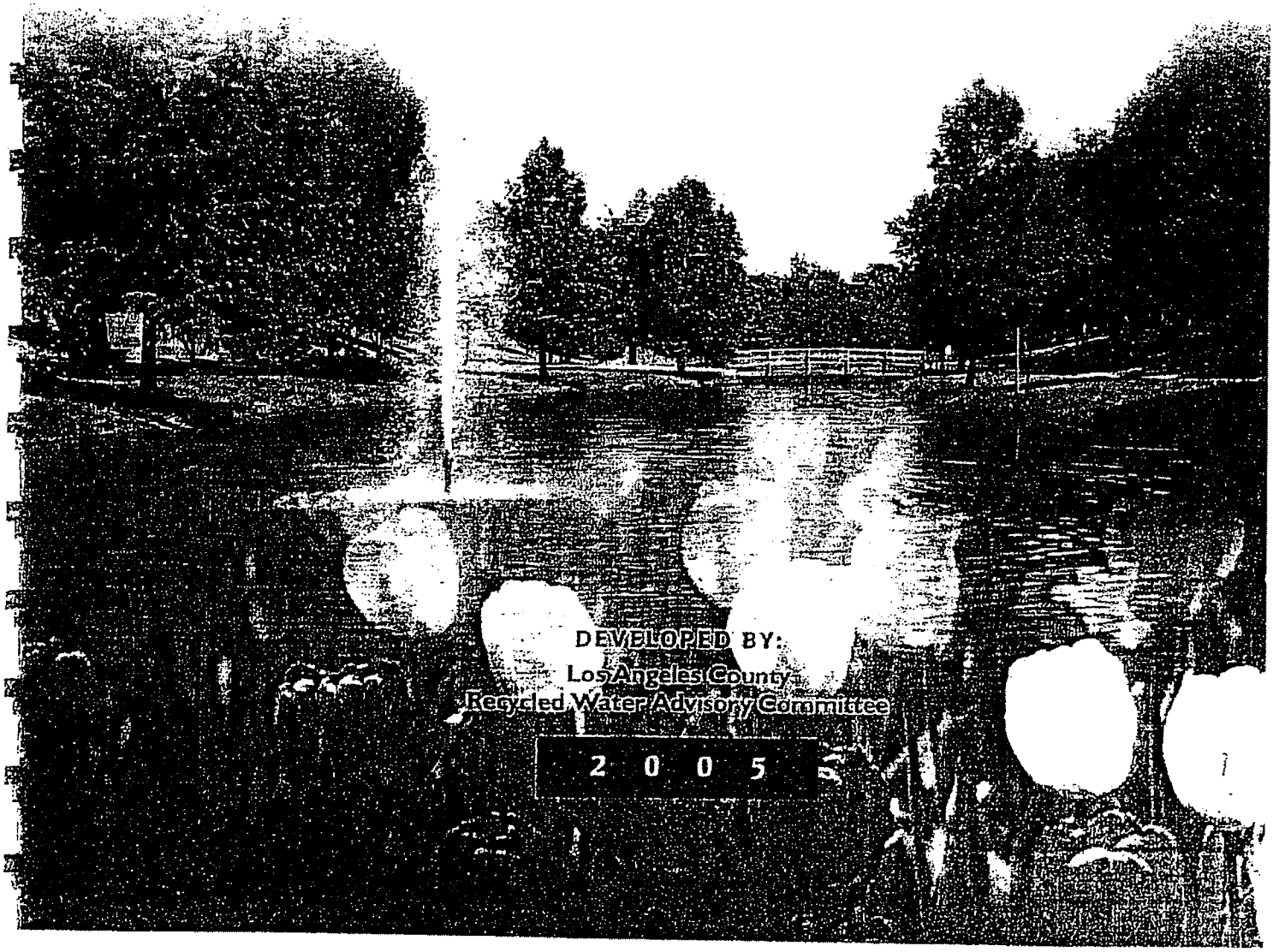
DRAWING NO.: CW-555-R13

SHT 1 OF 1

CADD FILE NUMBER: CW555.DWG

APPENDIX D:
RECYCLED WATER USER MANUAL

Recycled Water
USER MANUAL



DEVELOPED BY:
Los Angeles County
Recycled Water Advisory Committee

2005

"On-Site" Supervisor Do's and Don'ts

Do's

- Install and maintain signs at all points of entry (pedestrian and vehicular)
- Install and maintain labels and tags on recycled and potable water systems
- Operate irrigation system:
  - Between 10 p.m.–6 a.m. if automatically controlled (unless other restrictions apply)
  - At other times if manually controlled and supervised (someone present) to make sure the recycled water doesn't come in contact with the public
  - At any time if use site is restricted to the general public
- Use quick couplers instead of hose bibbs
- Contact "provider" if any water system (potable or recycled) modifications are anticipated
- Immediately contact water utility and/or recycled water producer if any of the following has occurred:
  - A recycled water line break, spill or off-site discharge of recycled water
  - A violation of water recycling requirements
  - A cross-connection between the recycled and potable water systems
- Educate/train site workers on safe use and restrictions of recycled water
- Keep records and as-built drawings up-to-date and accessible
- Assist and cooperate during Periodic Visual Inspections
- Assist and cooperate during Periodic Cross-Connection Testing

Don'ts

- Don't drink recycled water
- Don't use recycled water to wash hands or any other part of body
- Don't remove recycled water identification signs, tags or labels
- Don't cross-connect two dissimilar water systems (recycled to potable)
- Don't allow recycled water to contact drinking fountains or eating areas
- Don't allow recycled water to pond or puddle
- Don't allow recycled water to runoff the use site property by either overspray or overwatering
- Don't use recycled water on an unapproved site
- Don't put hose bibbs on recycled water systems (unless public access is restricted)
- Don't use the same equipment on both recycled water and domestic water systems (for example, quick couplers, tools, etc.)
- Don't modify any water system without prior approval of provider and/or Health Department

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FOREWORD

The Recycled Water Urban Irrigation User's Manual (Manual) has been prepared to convey the general rules, regulations and guidelines regarding the safe introduction and use of recycled water for landscape irrigation in Los Angeles County and other areas in the State of California. This document was prepared by the *Los Angeles County Recycled Water Advisory Committee* (LACRWAC, a local chapter of the California Section of the WateReuse Association), which is comprised of water utilities, regulatory interests, and other entities interested in the safe introduction and use of recycled water. At the time of this publication, LACRWAC included:

Regulatory Agencies:

- State of California Department of Health Services
- County of Los Angeles Department of Health Services
- Los Angeles Regional Water Quality Control Board

Water and Wastewater Utilities:

- Castaic Lake Water Agency
- Central Basin Municipal Water District
- City of Burbank
- City of Glendale
- City of Long Beach
- City of Pasadena
- County Sanitation Districts of Los Angeles County
- Las Virgenes Municipal Water District
- Los Angeles Department of Water & Power
- Metropolitan Water District of Southern California
- Water Replenishment District of Southern California
- West Basin Municipal Water District
- Upper San Gabriel Valley Municipal Water District

Other Interested Entities:

- California State Department of Water Resources
- Carollo Engineers
- CH2M HILL
- Tetra Tech, Inc.

Each recycled water customers' representative ("Site Supervisor") is responsible to read and understand the Manual and any water reclamation requirements applicable to their particular site. Questions about the use of recycled water or the Manual should be directed to the "Recycled Water Agency" that serves the customer.

INTRODUCTION

PURPOSE

The purpose of this Manual is to provide the recycled water "User" and "Site Supervisor" a resource for the day-to-day operation and control of that system, in order to protect the health and welfare of the personnel involved with its use as well as the general public, and to protect the quality of local water resources. Recycled water is an important resource for the State of California, and its use for nonpotable applications is, in many cases, mandated by State law. This Manual provides necessary information to meet existing regulations for the operation of the User's recycled water system.

Every effort has been made to ensure that this Manual is in compliance with, and is not intended to supersede, existing codes, laws, statutes and regulations of the State of California, Regulatory Agencies and local governing bodies, concerning the currently approved use of recycled water. This Manual is also not intended to supersede the American Water Works Association (AWWA) California-Nevada Section's Guidelines for Distribution of Nonpotable Water or Guidelines for the On-site Retrofit of Facilities Using Disinfected Tertiary Recycled Water.

Since legal and regulatory requirements can change without the express approval or knowledge of the Recycled Water Agency, the Recycled Water Agency assumes no liability for errors in this Manual. It's the responsibility of the User to check with its Recycled Water Agency before initiating any operational or physical changes to the use site's system.

This Manual is organized in the following manner:

- The *User's Summary* provides a brief commentary on major topics and indicates a page number to find additional information.
- *General Provisions* covers the basic administrative requirements including authorities, responsibilities and liabilities.
- *Design and Construction* covers the considerations needed when an on-site recycled water system is first installed or modified.
- *Operation and Maintenance* covers the basic conditions for service contained in the State of California's "Water Recycling Criteria".
- *Marking and Equipment* gives the basic requirements for marking the water systems and signing the use area.
- *Cross-connection Controls* and *Pressure Testing Procedure* outline the requirements for protecting the potable water system and keeping it separate from the recycled water system.
- *Sample Forms and Site-Specific Details* provides a summary of steps to obtain recycled water, templates of sample forms to help with inspections and a location for information specific to the use-site.
- *Local Governing Agencies* provides the names, addresses and phone numbers of agencies responsible for the regulatory administration of water recycling activities.
- *Definitions* are included for terms used within the Manual.

WHAT IS RECYCLED WATER?

"Recycled water," (also called "reclaimed water") as used in this Manual and defined in Title 22, Chapter 3 of the California Code of Regulations, refers to tertiary-treated water produced from the three-stage treatment of municipal wastewater (see box, right). (Although secondary-treated effluent may also be reused, its applications are limited and subject to much greater restrictions, and it will not be addressed in this Manual.) The facilities that produce recycled water are known as Water Recycling (or Reclamation) Plants that are owned and operated by "Recycled Water Producers." The recycled water produced by these plants is delivered to users through distribution systems owned and operated by "Recycled Water Agencies." Recycled Water Producers and Agencies can be one and the same entity.

The Recycled Water Treatment Process

- **Primary Treatment** removes 70 to 85 percent of the organic and inorganic solids that either settle out or float to the top.
- **Secondary Treatment** mixes the remaining suspended waste solids with microorganisms and air. The microorganisms convert the waste solids to biomass that settles out.
- **Tertiary Treatment** filters out most of the remaining solids through a granular media (for example, sand or anthracite coal) or a membrane, with the final product water being disinfected with chlorine or ultraviolet light to kill off bacteria, virus and other microorganisms.

Recycled water is virtually colorless and odorless, and is allowable for full-body human contact but **not** for direct human consumption. The sensible use of recycled water affords an excellent choice for essentially all non-potable applications. Properly managed, recycled water is safe to use.

WHAT ARE "DUAL SOURCE" SITES?

"Dual source" sites are reuse sites where both potable (domestic or drinking) water and recycled water are present. Dual sources might be necessary on sites where water is normally available for public use. For example, a cemetery may use recycled water for irrigation, but would need a separate potable system with hose bibbs to allow visitors to fill flower urns. "Dual plumbed sites" is a separate term which refers specifically to either buildings that have both recycled and potable water serving interior fixtures, or individual residences that use recycled water for outside irrigation, and is dealt with later under *Periodic Cross Connection Testing* (page 27). The public must not be allowed access to the recycled water system (such as from hose bibbs). Water quality needs at the use site might also call for two water sources. For example, golf courses may elect to use a potable water supply to irrigate the greens and use recycled water on the fairways.
(**Note:** The potable water used for this purpose is referred to as "non-potable irrigation water" after it has passed through the irrigation system backflow preventer. These water lines are to be used only for irrigation and must not be connected to restrooms, drinking fountains, food service areas, etc.)

On sites with dual sources, the potable supply must be protected with an approved backflow prevention device.

Cross-connections between the recycled water system and the potable water system are strictly prohibited.

BENEFITS OF RECYCLED WATER IRRIGATION

As population growth increases the demand for potable water and the reliability of imported water supplies decreases, the future availability of potable water for irrigation is questionable. Also, the costs of potable water supplies continue to climb, making recycled water more attractive as an alternative water supply.

The amount of recycled water available is generally not affected by drought, meaning customers don't risk losing expensive landscaping due to water shortages and potential mandatory rationing.

Tertiary-treated recycled water can be used for virtually all non-potable applications (see box, right).

Recycled water may also contain an appreciable nutrient content, such as nitrogen, potassium, calcium, magnesium, sulfur, and other macro and micronutrients, which may provide some level of fertilization during the irrigation process. A full recycled water quality analysis can be obtained from the local Recycled Water Agency.

Irrigating with recycled water is making use of a valuable resource that would otherwise be disposed.

TITLE 22 USES FOR TERTIARY-TREATED WATER

Urban Landscape – Parks and playgrounds, schoolyards, unrestricted access golf courses, residential landscaping, freeway and roadway landscaping, cemeteries, ornamental nurseries, sod farms.

Agriculture – Food crops for human consumption, orchards, vineyards, fodder, fiber and seed crops, non-nut bearing trees, pasture for milking animals, water supply for livestock.

Impoundments – Restricted and unrestricted recreational impoundments, decorative lakes and fountains, fish hatcheries.

Industrial – Industrial processes (e.g. paper manufacturing, carpet and textile dyeing, boiler feed), cooling towers and air conditioning, non-residential toilet urinal and floor drains, structural and non-structural fire fighting, commercial laundries, commercial car washes, concrete mixing, construction dust control, soil compaction, backfill consolidation around pipelines including potable), street and sidewalk cleaning, flushing sanitary sewers, snow making.

ARE THERE DISADVANTAGES TO USING RECYCLED WATER?

Recycled water must be used responsibly within established guidelines, regulations and permit requirements. Because of its origins and the level of treatment provided, recycled water is not suitable for direct human consumption. Unlike potable water, recycled water can only be used for approved uses, at approved locations, under the provisions of established regulations, agreements or permits. At the time of this writing, there have been no known cases of illness in the State of California due to the proper use of recycled water (according to the State DHS).

In very rare occasions, there may be temporary interruptions of recycled water deliveries, as there are in any utility. Such instances are generally short in duration.

NEED FOR REGULATIONS

Regulations make the use of recycled water possible. Regulations ensure consistent, reliable water quality while being fully protective of the public health. California Code of Regulations Titles 22 and 17 are the two sets of State DHS regulations that accomplish this. Title 22 establishes the requirements for recycled water treatment, quality and allowable use. Title 17 establishes the requirements for backflow protection of the potable water supply.

Copies of these regulations may be obtained from your Recycled Water Agency.

USER'S SUMMARY

Recycled water is a safe and effective resource for nonpotable use. Properly managed recycled water has a very limited health risk, if any. To help in the proper management of recycled water, the State of California, the local city or county Health Department and the Recycled Water Agency have developed rules and regulations for the safe use of recycled water. These rules and regulations are in place to insure that the User, its Site Supervisor and employees, and the public are protected from any health risk (real or perceived) that might be associated with the use of recycled water.

- Because recycled water is not suited for human consumption, every effort must be made to prevent the user's recycled water system from being cross-connected with the potable (drinking) water system.
- Plans must be carefully reviewed to ensure against cross-connections and that proper equipment is to be installed (Design Approval, page 10).
- The recycled water system must be operated under the authority of a "User's Agreement" (page 8) that outlines any special considerations or requirements for the particular use site.
- The User must designate a "Site Supervisor" (page 14) who is responsible for managing the on-site water system. The Site Supervisor ensures the system is operated within the established guidelines and is properly maintained (Maintenance, page 17).
- In cooperation with the User, the Recycled Water Agency and/or Producer will make regular inspections of the site (Periodic Site Inspections, page 17).
- The User must instruct all persons using recycled water of its proper use and precautions (Personnel Training, page 14).
- All piping and points of connection must be labeled with "Recycled Water -- Do Not Drink" (Marking and Equipment, page 21) and the universal "Do Not Drink" symbol (page 25).
- All recycled water use areas accessible to the public must be posted with signs visible to the public and must include the statement "Recycled Water -- Do Not Drink" (page 24) and the "Do Not Drink" symbol (page 25).
- An initial cross-connection test must be conducted to determine if there are any unknown connections between existing irrigation and potable piping prior to construction of retrofit work (Initial Cross-Connection Test, page 26).
- Prior to connection with the recycled water distribution system, a final cross-connection test must be performed to verify that construction or retrofit work was performed correctly (Final Cross-Connection Test, page 26).
- In the event of a cross-connection incident, the User must implement an emergency response plan (page 27).

SECTION A GENERAL PROVISIONS

REGULATORY AUTHORITY

Rules and regulations for the end use of recycled water are established and/or enforced by the California Regional Water Quality Control Board (Regional Board), the State DHS and the local city or county Health Department. These rules and regulations are typically contained in a permit from the Regional Board issued to the Recycled Water Agency and/Producer. All facilities using recycled water must be designed and operated to meet the standards of the local governing codes, rules and regulations.

Various regulations for recycled water use may be outlined in the Recycled Water Agency's Recycled Water Ordinance. However, if recycled water service is provided by an Investor Owned Utility, the various regulations for recycled water use are outlined in the Recycled Water Agency's Tariff Schedules as approved by the California Public Utilities Commission.

From time to time there may be amendments to existing regulations. These amendments may be made without the knowledge or consent of the User or the Recycled Water Agency. These amendments will be enforced upon their effective date. The Recycled Water Agency will make every effort to make sure the User is made aware of these changes when they occur.

SYSTEM RESPONSIBILITY

The Recycled Water Agency is responsible for the operation and maintenance of its recycled water distribution system up to the point of connection to the User. However, it's the responsibility of the User to maintain its recycled water system downstream of the point of connection (usually the meter) with the Recycled Water Agency's distribution system. The User is responsible for ensuring that the recycled water is used on its site according to all the rules and regulations regarding such use. Specifically, the User is responsible for the following:

- Maintaining the use site's recycled water system.
- Ensuring that all materials used during the design, construction and maintenance of the system are approved or recommended for recycled water use by the AWWA California-Nevada Section's Guidelines for the On-site Retrofit of Facilities Using Disinfected Tertiary Recycled Water.
- Obtaining all permits and payment of all fees required for the establishment, operation and maintenance of the User's recycled water system.[1]
- Reporting all violations and emergencies to the required local governing agencies. A listing of these agencies is provided in Section H.
- Obtaining prior authorization from the Recycled Water Agency and any required regulatory agency before making any modifications to the approved recycled water system (or the potable water system if it's in close proximity to the recycled system).

[1] Permitting and/or fee assistance may be available from the Recycled Water Agency.

USER AGREEMENT AND PERMITS

A potential User must complete all of the Recycled Water Agency's requirements (for example, permit application) prior to the issuance of a User Agreement. (**Note:** "User Agreement" is the term used to describe any agreement, contract, permit, ordinance, memorandum of understanding or other such document used by the Recycled Water Agency to present the terms and conditions for the use of recycled water by a User.) The Recycled Water Agency reserves the right to alter, on a case-by-case basis, the User Agreement.

RATE AND FEE SCHEDULE

If recycled water is provided by a public entity, such as a water district or municipality, all rates and fees concerning recycled water service will be established and fixed by the Recycled Water Agency.

If recycled water is provided by an Investor Owned Utility, all rates and fees concerning recycled water service shall be established and fixed by the California Public Utilities Commission.

PROTECTION OF PUBLIC HEALTH

The Recycled Water Agency reserves the right to take any action necessary with respect to the operation of the User's on-site recycled water system in order to safeguard the public health.

AUTHORIZED USES

The use of recycled water is limited to those uses approved by the Regional Board or the State DHS. Any other use of recycled water is prohibited without the prior approval, on a case-by-case basis, of the Recycled Water Agency and the appropriate Regulatory Agencies.

APPROVED USE AREAS

Recycled water may only be used in areas approved by the Recycled Water Agency, following the User's completion of the Recycled Water Agency's application procedure and its meeting all of the requirements of the applicable Regulatory Agencies.

A User may **never** supply recycled water to another owner's adjoining property or to the property of the same User across a street or alley without the prior written approval of the Recycled Water Agency. The User may not give or sell recycled water to another party. Should the property become sub-divided, the service will be considered as belonging to the parcel it enters directly. If such a subdivision occurs, or property ownership is transferred, the Recycled Water Agency must be notified.

In any case, recycled water lines are not permitted to cross lot lines. All recycled water delivered to any site must pass through a recycled water meter.

LIABILITY

The User is responsible for the operation and maintenance of the recycled water system downstream of the Recycled Water Agency's point of connection with the User, unless such responsibility is clearly outlined in the User Agreement/Permit (*Enforcement*, page 19).

The Recycled Water Agency shall not be liable for any water damage or other damage caused by the User due to defective or broken plumbing or faulty service, nor shall the Recycled Water Agency be liable for

damage caused by the User's facilities. This includes changes in the recycled water quality that may occur from sitting in ornamental lakes, storage tanks, pipelines, etc.

WATER SUPPLY CONTINGENCY

If at any time during construction or operation of the recycled water system, real or potential hazards are found, the Recycled Water Agency has the right and the responsibility to immediately suspend, with or without notice, recycled water service in the interest of protecting the public health.

The Recycled Water Agency may supply water to the affected area either temporarily or permanently from the potable water system with appropriate backflow protection (*Protection of Potable Water Systems*, page 26 and *Back-up Water Source*, page 11).

SECTION B DESIGN & CONSTRUCTION

DESIGN APPROVAL

Before the construction of any new or major modifications of an existing recycled water system, the design must be submitted for approval by the Recycled Water Agency and the State and local city or county Health Departments. Approval will be contingent upon evidence that all applicable design requirements, rules and regulations for a recycled water system are satisfied. Plans and specifications should include, but not be limited to, the following:

- A detailed description of the intended use of recycled water, including identification of the area of use.
- Details showing the complete potable and recycled water systems. For existing facilities converting to recycled water use, details must include the exact location of all existing water piping systems.
- Details of the intended installation procedures, including as a minimum: backflow preventer locations, color and type of pipe, and additional signage to be used.

CONSTRUCTION

The appropriate regulatory and recycled water agencies shall have the opportunity to make periodic inspections of the User's site during the construction phase, if applicable, to ensure materials and their installation are according to the approved plans and specifications.

The Recycled Water Agency and/or the State, local city or county Health Department or their authorized agents shall inspect the construction and startup of the User's recycled water system to ensure that it is in compliance with the approved construction plans, rules and regulations. In addition, representatives of the Regional Board and the State DHS may be involved.

This site inspection is to ensure that proper equipment was used, spray patterns are adjusted to ensure proper coverage without excessive overlapping, and there are no cross-connections with the on-site potable water system. Conditions that might create runoff, ponding or windblown spray, especially on slopes must be corrected. Spray patterns must be checked to make sure that they don't encroach upon public facilities such as drinking fountains or areas outside the approved use area. After correction and verification the system will be allowed to use recycled water.

RECYCLED WATER DELIVERY SYSTEM OPERATION

The Recycled Water Agency reserves the right to control and schedule the use of recycled water, if control and scheduling are necessary to maintain acceptable working conditions within that agency's recycled water distribution system. The Recycled Water Agency will administer these and other service conditions.

If the available service pressure is higher than the User can accept, the User shall be responsible for providing a pressure-reducing valve downstream of the service meter. If available pressure is lower than what the User needs, the User shall be responsible for providing booster pumping downstream of the meter. Any pumping of recycled water requires the prior written approval of the Recycled Water Agency.

The Recycled Water Agency must ensure that the quality of the recycled water in its distribution system is not compromised by any User. Therefore the Recycled Water Agency may require backflow protection on the User's recycled water system. This backflow protection might be just downstream of the recycled water meter or at specific, on-site location(s) where an activity of the User (such as fertilizer injection) could degrade the quality of the recycled water in the distribution system. If necessary, details will be included in the User Agreement.

Backflow prevention devices must be approved by the Recycled Water Agency and the appropriate regulatory agencies. Devices must be properly maintained, inspected quarterly and tested at least annually. Backflow prevention assemblies, when required on recycled water systems, must be conspicuously labeled. Based on the provisions of the User Agreement, the Recycled Water Agency may provide the required test equipment.

Backup Water Source

If potable water is to be used as a backup source to the recycled water system, it must be done only through an air-gap separation between the two systems and with the prior approval of the State DHS and the local city or county Health Department. The State DHS permits the use of a "swivel-ell" assembly (see sample schematic, next page) that allows for the use site's water supply to be switched between the recycled and potable water systems, if certain stringent requirements are met.

FIRE PROTECTION SYSTEMS

Some recycled water use sites may also have separate potable water service connections for dedicated fire protection systems. Depending on the Class of fire protection system on the reuse site, if the fire service includes piping for delivery systems outside of buildings and the manner of on-site recycled water usage, then either single check valve, double check valve or RP backflow assemblies may be required at the fire supply meter.

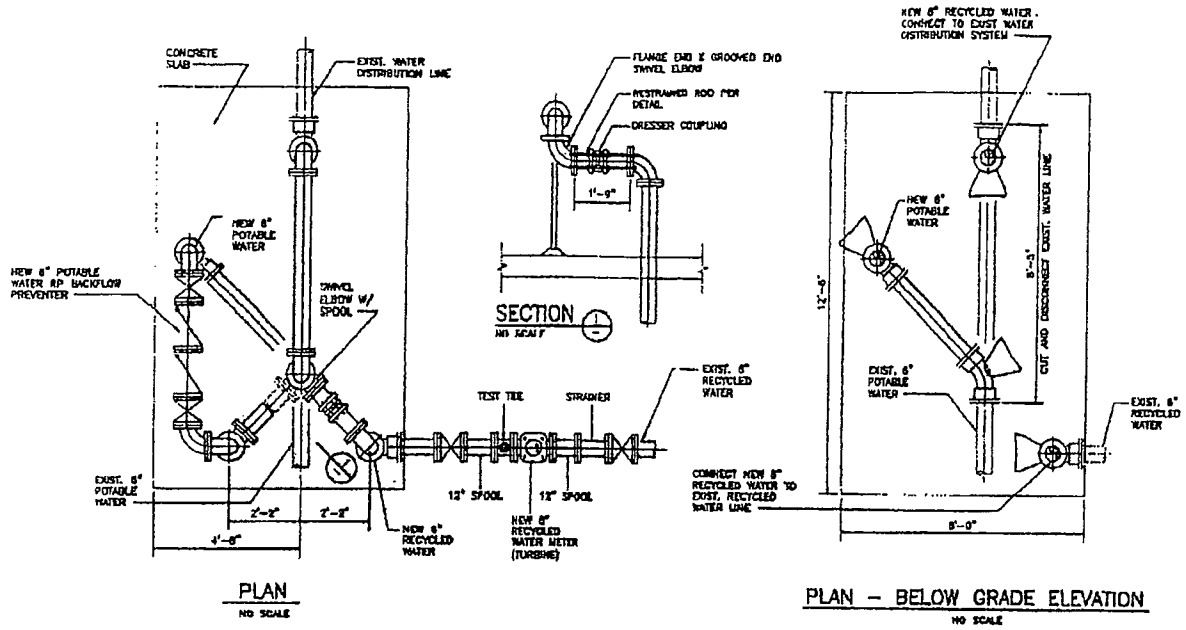
Since requirements vary from place to place, the exact requirements will be provided to the User by the Recycled Water Agency, Regulatory Agency and/or the local city or county Health Department.

PROTECTION OF GROUNDWATER

Irrigation with recycled water within 50 feet or impoundment of recycled water within 100 feet of any drinking water reservoir or well is prohibited. Proposed irrigation with recycled water within 50 feet or impounding recycled water within 100 feet of a non-potable water well requires the approval of the appropriate health agency.

SERVICE STARTUP

Following the acceptance of the User's recycled water system by the Recycled Water Agency, the User may request regular service startup. Upon receipt of the startup request, the Recycled Water Agency will notify the appropriate regulatory agencies, and schedule a final inspection. The startup request shall include the appropriate documentation and any payments and/or fees as indicated in the Recycled Water Agency's User Agreement.



Sample schematic drawing of a "swivel-ell" assembly for a back-up potable water supply.

SECTION C OPERATION & MAINTENANCE

GENERAL

Recycled water service will be provided by the Recycled Water Agency only to those Users who have a current User Agreement for such service, unless otherwise determined by the Recycled Water Agency's Governing Board. This recycled water service can be revoked any time at the discretion of the Recycled Water Agency.

Recycled water service must be made available only in accordance with all applicable Federal, state, and local statutes, ordinances, regulations and contracts, and other requirements including the California Water Code, the California Code of Regulations Titles 17 and 22, and requirements and regulations imposed by the Regional Water Quality Control Board, the State DHS, the local city or county Health Department and/or the recycled water Producer. The User must comply with the conditions of any User Agreement issued by the Recycled Water Agency.

Recycled Water Agencies may not deliver recycled water to Users that do not or will not comply with use site requirements.

CONDITIONS OF SERVICE

The User must comply with the following conditions.

Runoff Conditions

The irrigation systems must be designed, constructed and operated to minimize to the fullest extent practical runoff outside the approved use area.

Ponding Conditions

The irrigation systems must be designed, constructed and operated to minimize to the fullest extent practical ponding within or outside of the approved use area. This does not apply to approved impoundments such as golf course water hazards or decorative lakes.

Windblown Spray Conditions

The irrigation systems must be designed, constructed and operated to minimize to the fullest extent practical windblown spray from leaving the approved use area.

Unapproved Uses

Use of recycled water for any purposes other than those explicitly described in the Recycled Water Agency's water recycling permit is strictly prohibited.

Use in Unapproved Areas

The delivery and use of recycled water for any reason, including approved uses, in areas other than those explicitly approved in the current effective user permit and without the prior approval of the appropriate Regulatory Agencies, is strictly prohibited.

Cross-Connections

Cross-connections, as defined by the California Code of Regulations, resulting from the use of recycled water or from the physical presence of a recycled water service, whether by design, construction practice, or system operation, **are strictly prohibited.**

If any cross-connection is discovered, the User shall immediately turn off the system, notify the Recycled Water Agency and implement the *Emergency Cross-Connection Response Plan* (see page 27).

DESIGNATION OF SITE SUPERVISOR

It is the User's responsibility to provide surveillance and supervision of its on-site recycled water system in a way that assures compliance at all times with current regulations and the recycled water permit requirements. The User shall designate, with notification going to the Recycled Water Agency, a Site Supervisor to be the contact person with the Recycled Water Agency. The following are requirements of the Site Supervisor position:

- Received training or be able to demonstrate knowledge of the application and maintenance of a recycled water system.
- Be aware of, and familiar with, this Manual.
- Be available to the Recycled Water Agency at all times and have the authority to carry out any requirements of the Recycled Water Agency.
- Be responsible for the installation, operation and maintenance of the recycled and potable water systems, and for the prevention of potential hazards.
- Ensure that notification signs at the use site are properly installed and maintained, and that all recycled and potable water facilities are properly labeled, tagged or otherwise identified.
- Be knowledgeable of the provisions contained in Titles 17 and 22 of the California Code of Regulations relating to the safe use of recycled water and maintain accurate records.
- Ensure that all employees of the use site involved with the use of recycled water are instructed in the safe and responsible use and handling of the recycled water.
- Immediately inform the Recycled Water Agency of any failures, violations and emergencies that occur involving the recycled or potable water systems.
- Be familiar with the basic concepts of backflow and cross-connection prevention, system testing, and related emergency procedures, and participate in any cross-connection tests.

The Recycled Water Agency must be notified immediately of any change in personnel for the Site Supervisor position. The Recycled Water Agency will provide the Site Supervisor with periodic inspections of the User's system and report all violations to the appropriate Regulatory Agency according to applicable procedures established by law, code, permit or practice.

PERSONNEL TRAINING

All new employees must be trained in the proper use of recycled water. Supervisory personnel and the Site Supervisor should be held accountable to ensure that employees are not using recycled water carelessly or improperly. It is the responsibility of the User to train all operations personnel so they are familiar with the use of recycled water. Any training program should include, but not be limited to, the following:

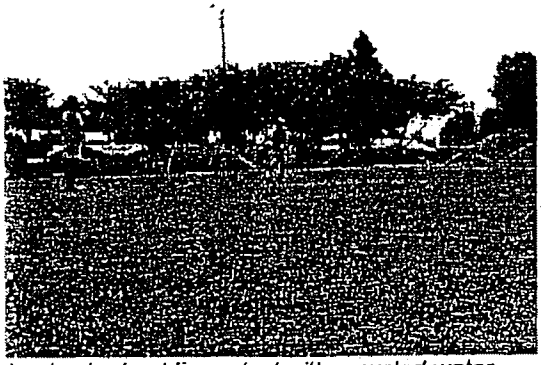
- Operations personnel must be aware that recycled water, although highly treated, is non-potable. **Recycled water may never be used for human consumption.**
- Operations personnel must understand that working with recycled water is safe if common sense is used and appropriate regulations are followed.

- Operations personnel must understand that conditions such as ponding and runoff are not allowed.
- Good personal hygiene must be followed (for example, washing hands after working with recycled water).
- Operations personnel must understand that there is never to be a direct connection between the recycled water system and the potable water system.

PERIODS OF OPERATION

Operation of the User's on-site recycled water system must adhere to the following requirements.

- Irrigation may only occur during periods of least use of the approved area by the general public. This is usually between the hours of 10 p.m. and 6 a.m.; however, areas where public access is generally prohibited or minimized, such as commercial nurseries and freeway landscaping, may be irrigated at any time.
- The recycled water system must be operated to prevent overspray or windblown spray into unapproved areas.



Inadvertent public contact with recycled water irrigation spray must always be avoided.

- Even though tertiary-treated recycled water is approved for full-body contact by the State DHS, irrigation of public areas during other times may be performed if the irrigation system is operated manually and is supervised to avoid inadvertently exposing any members of the general public. This provision must be strictly followed.
- Consideration should be given to allow a reasonable dry-out time before the area is to be used by the public.
- Automatic control systems are to be used and programmed to prevent ponding and runoff of recycled water.
- The recycled water system must not be allowed to operate for periods longer than needed to satisfy the landscape water requirements. Recycled water must never be applied at a rate that is greater than the infiltration rate of the soil. Exceptions to this requirement for purposes such as leaching of soil must be specified in the User Agreement.

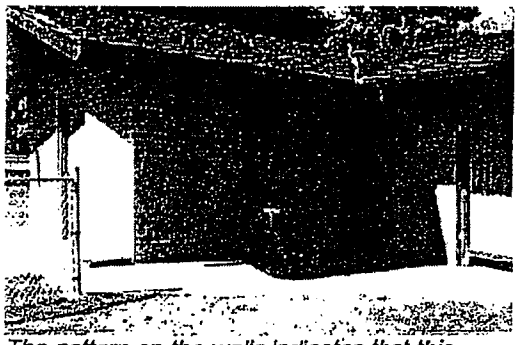
Hose bibbs may only be used with recycled water in areas were they cannot be accessed by the general public (such as this commercial nursery), and even those must be properly labeled.

HOSE BIBBS

Hose bibbs or other appurtenances that might allow public access to the recycled water system for unapproved use or for cross-connection to the potable water system are strictly prohibited in all areas accessible to the general public. In these areas, only quick-couplers are allowed and must be of a different type than those that may be used on the use site's potable water system (see page 23). Hose bibbs may be used on the recycled water system in areas that do not allow any public access but must be conspicuously labeled *"RECYCLED WATER -- DO NOT DRINK"* in both English and Spanish (or any other language determined by the Water Recycling Agency to be in common use in the area), along with the "Do Not Drink" symbol (page 25). Workers in these areas must be instructed not to drink from these hose bibbs.

DRINKING FOUNTAINS

Drinking fountains located within the approved use area must be protected from contact with recycled water by direct application through irrigation or other approved use. Lack of protection, whether by design, construction practice or system operation, is strictly prohibited.



The pattern on the walls indicates that this drinking fountain is being sprayed by the irrigation water. If recycled water is to be used, then the spray pattern must be altered or the drinking fountain somehow shielded.

EQUIPMENT CLEANING

Any device, hose, pipe, meter, valve, tank, pump, truck, etc. which has been used with recycled water may not be used to convey potable water nor attached to the potable water system unless it is cleaned and disinfected.

MODIFICATIONS

The User must not make any modifications to its on-site recycled water system (or potable system, it it's in close proximity to the recycled system) without the prior approval of the Recycled Water Agency.

This includes modifications to the approved plans or to an operational system. Detailed plans of any modifications should be submitted to the Recycled Water Agency and the modifications inspected by the Recycled Water Agency before their being placed in operation.

However, routine maintenance of the irrigation system, such as pipeline repairs, sprinkler replacement and other similar activities that don't result in a substantial change in either the recycled or potable water systems, or any agreed to operating plans, don't need prior approval by the Recycled Water Agency.

Emergency modifications or repairs that must be made by the User to its system in order to prevent contamination, damage or a public health hazard are covered under *Emergency Procedures* (page 18).

MAINTENANCE

The User must implement a preventive maintenance program that will ensure that the recycled water system always remains in compliance. A preventive maintenance program should include but not be limited to the following:

- Regular inspections should be conducted by the User of the entire recycled water system including sprinkler heads, spray patterns, piping and valves, pumps, storage facilities, lakes, controllers, signage, etc. Immediately correct any problems.
- All notification signs, labels and/or tags should be checked for their proper placement and readability. Replace damaged or unreadable signs, labels or tags.
- Special attention should be given to spray patterns to eliminate ponding, runoff and wind blown spray conditions.
- Establish and maintain an accurate records-keeping system of all inspections, modifications and repairs.
- Broken sprinkler heads, faulty spray patterns, leaking pipes or valves, etc. must be repaired when the malfunction becomes apparent.
- A maintenance program for backflow prevention assemblies that includes at least annual testing by a tester certified by the American Backflow Prevention Association (ABPA) or AWWA must be carried out. Records of annual tests, repairs and overhauls must be kept by the user with copies forwarded to the Recycled Water Agency and the local city or county Health Department.

PERIODIC SITE INSPECTIONS

Periodic site inspections of the User's recycled water irrigation system are mandated in the Water Code (Section 13523.1(b)(5)). Such inspections include, at a minimum, the visual inspection of all back-flow prevention devices, pump rooms, exposed piping, valves, pressure reducing stations, points of connection, sprinklers, controllers, lakes, storage facilities, signs, labeling, tags, etc. The Site Supervisor's maintenance records should also be inspected.

These inspections are the responsibility of the entity holding the master water recycling permit issued by the Regional Board. This may be the Recycled Water Agency or the Recycled Water Producer, if separate. Whoever the responsible agency is may perform this inspection, or it may be delegated to a third party. The responsible

agency will also determine the frequency of these inspections, based on local conditions. The Recycled Water Agency also reserves the right to make unannounced inspections of the use site's facilities, although at reasonable times.

Upon completion of the inspection, a Site Inspection Report Form (see example, page 34) should be signed and dated by both the Site Supervisor and the entity performing the inspection. The original form should be kept by the inspecting entity with copies going to the Site Supervisor, the Recycled Water Agency and/or Producer and any required regulatory agency.

Should a cross-connection be discovered during the inspection, the ***Emergency Cross-Connection Response Plan*** (page 27) should be immediately invoked by the Site Supervisor.

EMERGENCY PROCEDURES

In case of a major earthquake, the Site Supervisor should immediately inspect the potable and recycled water systems for damage. If either system appears damaged, both water systems should be shut off at their points of connection. The Site Supervisor should immediately contact the Recycled Water Agency for further instructions.

Emergency Modifications

Emergency modifications or repairs can be made by the User to the recycled water system without the prior approval of the Recycled Water Agency to prevent contamination, damage or a public health hazard. As soon as possible the User must notify the Recycled Water Agency of the emergency modifications and file a written report.

Unauthorized Discharge

It's the responsibility of the User to report to the Recycled Water Agency all system failures that result in an unauthorized discharge of more than 50,000 gallons of tertiary treated recycled water (or 1,000 gallons for any lesser quality recycled water). An immediate oral report followed by a written report is required.

Contamination of Drinking Water

In case of contamination of the potable water system due to a cross-connection on the User's premises, the Recycled Water Agency and the local city or county Health Department must be immediately notified by the User (see page 36). The User is to immediately invoke the ***Emergency Cross-Connection Response Plan***.

VIOLATIONS

The Recycled Water Agency reserves the right to decide if a violation of the conditions under which the User Agreement was issued has occurred. Violations may include non-compliance of any of the following prohibitions: runoff conditions, ponding conditions, windblown spray conditions, leaks or spills resulting from broken or damaged pipelines or appurtenances, unapproved uses, disposal in unapproved areas, cross-connections, unprotected drinking fountains and unauthorized or prohibited use of hose bibbs, whether willful or by accident. Any willful or accidental act of noncompliance with any existing Federal, state or local ordinance, code, law or statute regulating the use of recycled water constitutes a violation.

NOTIFICATION

It is the responsibility of the Site Supervisor to immediately notify the Recycled Water Agency of any failure or cross-connection in

his/her recycled or potable water system whether or not he/she believes a violation has occurred. It is also the responsibility of the Site Supervisor to immediately notify the Recycled Water Agency of any violation he/she believes might imminently occur because of any action the User's personnel might take during the operation of the recycled or potable water systems.

If there are any doubts whether a violation has occurred, it is the responsibility of the Site Supervisor to report each occurrence to the Recycled Water Agency so a decision can be made. It is then the Recycled Water Agency's responsibility to notify the Recycled Water Producer (if a separate entity) holding the master water recycling permit from the Regional Board and local governing agencies of any violations. These agencies are listed in Section H.

CORRECTIVE ACTION

If the Recycled Water Agency's investigation reveals that a violation has occurred on the reuse site, that agency must immediately notify the User of the violation and what corrective actions must be taken. It is the responsibility of the User to immediately initiate corrective action to eliminate the violation. If the Recycled Water Agency believes the violation constitutes a hazard to the public health, the Recycled Water Agency must immediately stop recycled water service to the User. It will be at the discretion of the Recycled Water Agency to decide if a violation has been adequately corrected.
The Recycled Water Agency may impose a startup fee upon resumption of service to a User whose service has been terminated, depending on the provisions of the User Agreement.

ENFORCEMENT

The Recycled Water Agency shall enforce all existing regulations concerning the use of recycled water and/or recycled water systems. Regulations concerning the use of any recycled water or recycled water system shall be applied with equal force and effect to any person, persons, or firm, public or private. **There will be no deviations from these regulations** except upon written authorization of the Recycled Water Agency, acting within applicable regulations. An appeal procedure may be provided for in the User Agreement or in the Recycled Water Agency's rules and regulations, and the action of the Recycled Water Agency will be final.

CAUSES FOR TERMINATION OF SERVICE

The Recycled Water Agency reserves the right to revoke a User's Agreement if any or all of the service conditions are not satisfied at all times. Service to a User may be terminated any time if:

- The Recycled Water Agency's distribution system is not capable of supplying recycled water.
- The quality of the recycled water does not comply with the requirements of the Regulatory Agencies.
- The User's operation does not conform to all applicable regulations, permit requirements and/or the terms of the User's agreement.
- There is nonpayment of service fees and charges by the User.

SECTION D MARKING & EQUIPMENT

GENERAL

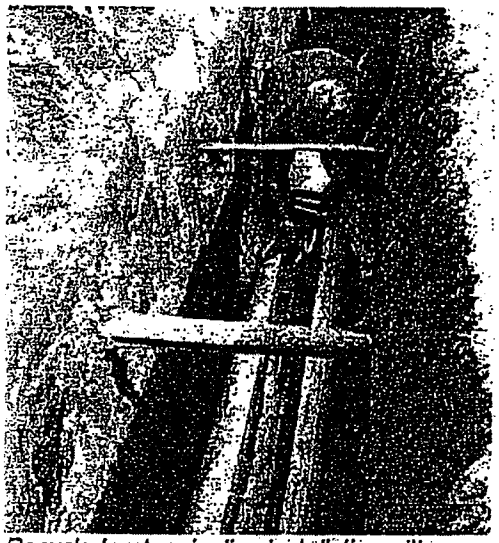
All materials, apparatus, piping, valves, controllers, sprinkler heads, pumps etc. for new recycled water irrigation systems must be approved for use in a pressurized recycled water system and installed according to approved plans. The recycled water system must conform to the AWWA California-Nevada Section's Guidelines for the On-site Retrofit of Facilities Using Disinfected Tertiary Recycled Water. Deviations will not be allowed without prior approval. System installation must conform to the Uniform Plumbing Code and all other local codes, rules and regulations.

The approved use area must be clearly marked. All outlets from the recycled water system must be marked *"CAUTION -- RECYCLED WATER -- DO NOT DRINK."* In addition, signs must be posted at all entrances to the use site indicating that recycled water is used for irrigation purposes. The "Do Not Drink" symbol (page 25) must be present on all signs. Recycled Water Agencies may also choose to require the signs to include translations into the appropriate foreign language(s), as not all areas have Spanish as the second language.

PIPING, BELOW-GRADE

All new piping must be installed according to the approved plans and marked as required. Installation must be in accordance with the latest edition of International Association of Plumbing and Mechanical Officials (IAPMO) Standard IS-8. Fittings, primers and solvents must be IAPMO listed. All new recycled and potable water lines (pressure/non-pressure), new and existing valve boxes and appurtenances must be identified to clearly distinguish between recycled water and potable water systems.

Identification of Recycled Water Lines
All new, buried recycled water lines (pressure/non-pressure) must be extruded purple-colored Schedule 40 (minimum) PVC pipe with continuous wording *"CAUTION -- RECYCLED WATER"* printed on opposite sides of the pipe. The use of continuous lettering on 3-inch minimum width purple tape with 1-inch black or white contrasting lettering bearing the continuous wording *"CAUTION -- RECYCLED WATER"* permanently affixed at 10-foot intervals atop all horizontal piping, laterals and mains is an acceptable alternative to the purple pipe. Identification tape must extend to all valve boxes and/or vaults and exposed piping.



Recycled water pipeline installation with continuous purple warning tape.

Piping buried under pavement must be sleeved with the sleeve being at least two (2) inches larger in diameter than the irrigation pipe.

When recycled and potable water lines cross, the recycled water line must be located at least 1-foot below the potable water line. If this separation is not possible, then either the recycled or potable water line must be sleeved to 10 feet on either side of the crossover. Parallel recycled and potable water lines must be at least 10 feet apart, or at least 4 feet, if the recycled line is enclosed in a sleeve.

Identification of Potable Water Lines

New buried potable lines must be identified by continuous lettering on 3-inch minimum width blue tape with 1-inch white lettering bearing the continuous wording *"POTABLE WATER"* permanently affixed at 10-foot intervals atop all horizontal piping, laterals and mains. Identification tape must extend to all valve boxes, vaults and exposed piping.

Identification tape is not necessary for extruded blue-colored PVC with continuous wording *"POTABLE WATER"* printed in contrasting lettering on opposite sides of the pipe.

Identification of Non-Potable Water Lines

Non-potable water is water supplied from the potable water system through an appropriate backflow preventer. All non-potable irrigation/industrial water lines (pressure/non-pressure) must be identified by continuous lettering on 3-inch minimum width yellow tape with 1-inch contrasting lettering bearing the continuous wording *"NON-POTABLE WATER – DO NOT DRINK"* permanently affixed at 10 foot intervals atop all horizontal piping, laterals and mains. Identification tape must extend to all valve boxes and/or vaults, exposed piping, hydrants and quick couplers.

Identification of Existing Below-Grade Water Lines

Existing below-grade piping, whether recycled, potable or non-potable, need not be marked unless the piping becomes exposed, such as during installation of new pipe or maintenance of existing pipe. The exposed section should be appropriately marked (as recycled, potable or non-potable) to the extent feasible.

PIPING, ETC., ABOVE-GRADE

All above-grade recycled water pipelines must be appropriately labeled and color-coded purple to differentiate recycled water pipelines from potable and non-potable water pipelines. If purple pipe is not used, recycled water pipelines may be wrapped with purple warning tape having the words *"CAUTION – RECYCLED WATER"* visible in contrasting black letters. Flexible conduits or hoses must be clearly marked *"CAUTION – RECYCLED WATER"* with each adapter or fitting painted purple.

Above-grade potable water pipelines must be labeled and color-coded blue to differentiate potable water pipelines from recycled and non-potable water pipelines. Potable water pipelines may be wrapped with blue identification tape having the words *"POTABLE WATER"* visible in contrasting white letters.

Above-grade non-potable water pipelines must be appropriately labeled and color-coded yellow to differentiate non-potable water lines from recycled water and potable water lines. Non-potable water lines may be wrapped with yellow identification tape having the words *"NON-POTABLE WATER – DO NOT DRINK"* visible in contrasting letters.

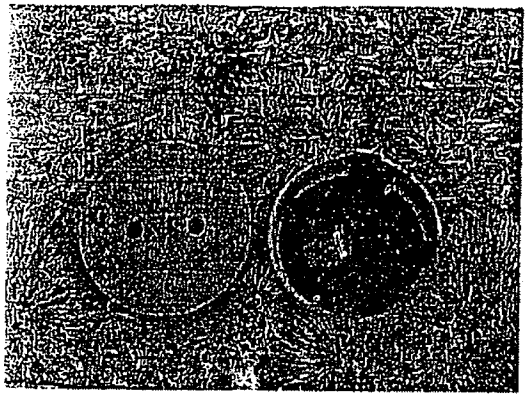
Exposed valve boxes, vaults, quick coupling valves, outlets and related appurtenances must be color-coded, labeled or tagged, to differentiate recycled water from potable water (that is, ***"CAUTION -- RECYCLED WATER -- DO NOT DRINK"*** in black or white contrasting lettering on a purple background, or ***"POTABLE WATER"*** in white lettering on a blue background or ***"NON-POTABLE WATER -- DO NOT DRINK"*** in contrasting lettering on a yellow background).

Tags must be identified with the appropriate wording on both sides. Tags identifying recycled water must have both the appropriate wording and the "Do Not Drink" symbol (page 26).

VALVES

Quick Coupling Valves

New quick coupling valves, made specifically for recycled water use, should be 3/4-inch or 1-inch nominal size and of brass construction with a normal working pressure of 150 psi. The covers on all new quick coupling valves must be permanently attached and made of purple rubber or vinyl with the words ***"RECYCLED WATER"*** imprinted on the cover, and must be provided with a lock. To prevent unauthorized use, the valve should be operated only with a special coupler key with an acme thread for opening and closing the valve. New quick coupling valves should be installed approximately 12 inches from walks, curbs, headboards or paved areas. All new and existing quick coupling valves must be identified with an identification tag and installed in a marked valve box.



Quick coupler and valve box

Gate Valves

New gate valves should be installed in a marked valve box with crushed rock in the base and a notification tag on the valve operator.

Remote Control Valves

New and existing remote control valves should be installed in a marked valve box with crushed rock in the base and an identification tag on the operator. For each valve system, remote control valves should be adjusted so the most remote sprinkler heads operate at the pressure recommended by the manufacturer giving a uniform distribution of water.

SPRINKLER HEADS

New sprinkler heads must be of the size, type, pressure, radius of throw and discharge as indicated on the approved plans. All new sprinkler heads, either permanent or temporary, should be of the approved type for use with recycled water and create the minimum amount of mist. Drainage through sprinkler heads is prohibited, and an anti-drain valve must be installed in the sprinkler riser as needed. Anchors on sprinkler risers should be provided as needed and maintained. Sprinkler heads must be kept in good repair at all times.

SYSTEM CONTROL DEVICES

New system controllers must be automatic with multiple start/stop times for any 24-hour period and installed according to the approved plans and local codes. Two, color-coded diagrams must be prepared for the station and system for each controller. Each diagram should be sealed in plastic with one copy placed in the controller box and the other given to the Recycled Water Agency. All controllers must be marked with the words *"RECYCLED WATER"* in black 1-inch high letters on a purple background.

STORAGE TANKS & IMPOUNDMENTS

All storage tanks, either stationary or portable, must be structurally sound and free from leaks. Each tank must be conspicuously marked with signs with the words *"RECYCLED WATER -- DO NOT DRINK"* in black letters 2-inches high on a purple background. The "Do Not Drink" symbol (page 25) should be present on all recycled water storage tanks. Impoundments (lakes) that receive recycled water are classified as "unrestricted" (swimming and body contact allowed), "restricted" (no swimming or body contact, but non-contact activities such as fishing and boating allowed) or "ornamental" (no recreational activities allowed). All of these impoundments must have the recycled water valves and outlets marked or tagged with the words *"RECYCLED WATER -- DO NOT DRINK."* At restricted and ornamental impoundments, adequate measures must be taken to prevent body contact. All recycled water impoundments must be kept separate from potable water wells and reservoirs.

If any storage tank or impoundment receives both recycled and potable water, the potable water supply must be properly air-gapped to avoid a cross-connection.

OTHER DEVICES

All air/vacuum relief valves, valves, pressure reducing valves, pumps, pump control valves, etc., must be tagged or labeled indicating whether it is on the recycled water, non-potable water or potable water system. Recycled water tags or labels must have a purple background with black lettering stating *"RECYCLED WATER -- DO NOT DRINK."* The "Do Not Drink" symbol (page 25) must be present.

Potable water tags or labels must have a blue background with *"POTABLE WATER"* in white lettering.

Non-potable water tags or labels must have a yellow background with *"NON-POTABLE"* in black lettering.

VEHICLE IDENTIFICATION

Any vehicle used to transport recycled water must be clearly marked with labels or signs that contain the words *"RECYCLED WATER -- DO NOT DRINK"* in black 2-inch high letters on a purple background and include the "Do Not Drink" symbol (page 25). One label or sign should be placed on the tank closest to the driver's door, with a second label or sign being placed on the rear surface of the tank at the outlet. All labels and signs must be placed where they can easily be seen by the personnel using the vehicle.

Any vehicle used for the transportation or storage of recycled water must not be reused for the transportation or storage of potable water, unless it has been flushed, disinfected and tested.

POSTING APPROVED USE AREA

Posting the use of recycled water is required at all entrances to the User's facility, and placed where they can be easily seen. The signs must indicate that ***"RECYCLED WATER"*** is in use. In addition, all signs must include the "Do Not Drink" symbol (page 25) and use the words "do not drink," in both English and Spanish (or other locally used language). Additional signing may be required by the Regulatory Agency on a case-by-case basis.

Recycled water notification signs do not need to include such words as "Caution," "Warning" or "Danger."

"DO NOT DRINK" SYMBOL

SECTION E CROSS-CONNECTION CONTROL

PROTECTION OF POTABLE WATER SYSTEMS

On "dual source" sites where both potable water and recycled water exist, the potable supply must be protected against accidental cross-connections. In lieu of an air-gap, reduced-pressure principal backflow prevention (RP) devices are generally approved by the State DHS and the Recycled Water Agency. This is done according to the approved site-specific drawings.

Backflow prevention devices must be approved by the Recycled Water Agency and the appropriate regulatory agencies before installation. If an RP is installed, it must be tested annually. The device testing must be done by a backflow prevention device tester certified by the ABPA or the AWWA. Test reports must be provided to the Recycled Water Agency and the regulatory agency requiring the test. Records must be maintained for at least three (3) years by both the User and the Recycled Water Agency.

INITIAL CROSS-CONNECTION TEST

Prior to retrofit work or construction, a initial cross-connection inspection and test must be coordinated by the Recycled Water Agency, with all appropriate health agencies being notified. This test should follow the general guidelines outlined in Section F. The purpose of the test is to determine if there are any connections between the existing irrigation system and the potable water system prior to construction.

During the lifetime of the recycled water system, the Recycled Water Agency must periodically inspect the recycled water system to ensure compliance with all applicable rules and regulations. Additionally, the Recycled Water Agency may be required to perform periodic inspections of the system for cross-connections (including shut-down tests, if appropriate), depending on the use site characteristics.

FINAL CROSS-CONNECTION TEST

On sites where both recycled and potable water are present, a cross-connection test must be performed using potable water supplied through an approved backflow prevention device before connecting the User's on-site recycled water system to the Recycled Water Agency's distribution system. This on-site test is to ensure the absolute separation of the recycled and potable water systems. The Recycled Water Agency shall coordinate the scheduling of the cross-connection test. Periodic testing using the same procedures may be required in the future, depending on the use site's characteristics. A written report documenting the test results must be submitted to the Recycled Water Agency, the State DHS and the local city or county Health Department following completion. A pressure (shut down) test procedure is detailed in Section F.

As an alternative to the pressure test, a dye test may be performed by charging the recycled water system with potable water containing a food grade colored dye. The unpressurized potable water system is then checked for any evidence of the colored dye. If the dye is found, a cross-connection

exists. This test itself must be done in a way that does not create a cross-connection.

Upon the successful completion of one of the above tests, insuring no cross-connections between the potable and recycled water systems, the User's irrigation system may be connected by the Recycled Water Agency to the recycled water distribution system.

PERIODIC CROSS-CONNECTION TESTING (PCCT)

Periodic cross-connection shutdown testing must be done at least once every four (4) years for "dual-plumbed" sites, unless visual inspections or major on-site water system changes reveal a need for more frequent testing. The Water Recycling Criteria in Title 22 specifically defines "dual-plumbed" sites as either buildings with fixtures served with recycled and potable water or individual residences with recycled water in the irrigation system.

Other "dual-source" use sites that don't fall under either of these categories may be required to perform periodic cross-connection tests if the use site characteristics indicate a greater risk of potential cross-connections, or if any reuse site undergoes significant modifications of the potable or recycled water systems. The Recycled Water Agency, in cooperation with the local city or county Health Department, will make the determination if such a test is required.

This test must follow the same procedures use for the final cross-connection test (either shut-down or dye test). Before the test is performed representatives of the State DHS, the local city or county Health Department, Site Supervisor, Recycled Water Agency, and any other required regulatory agency must be notified. The Recycled Water Agency will coordinate the scheduling of the test. A sample Test Notification Form is on page 36.

Written verification of the test results must be provided by the Recycled Water Agency to the Site Supervisor, State DHS, local city or county Health Department, local building authority and any other required regulatory agency. All provisions of Title 17, Chapter 5, Section 7601 of the Code of Regulations, concerning protection of drinking water systems against cross-connections and backflow, must be strictly complied with.

EMERGENCY CROSS-CONNECTION RESPONSE PLAN

In the event that a backflow incident or cross-connection is suspected or occurs the following procedures must be implemented immediately.

1. Keep the potable water system pressurized and, if possible, post *"DO NOT DRINK"* signs at all potable water fixtures and outlets.

2. Immediately shut down the recycled water supply to the facility at the meter.

3. Notify the Recycled Water Agency and the appropriate Health Department(s) by phone (see list on page 37). This notification is to be followed by a written notice within 24 hours. The written notice is to include an explanation of the nature of the cross-connection, date and time discovered, and the steps taken to mitigate the cross-connection(s).

4. Collect water samples from the potable water system and perform a 24-hour bacteriological analysis (as instructed by the Recycled Water Agency). Water samples should be collected from the closest possible point to the cross-connection.

5. Identify the cause and location(s) of backflow and eliminate the cross-connection(s).

6. Conduct a cross-connection test in coordination with the Recycled Water Agency and the appropriate Health Departments to verify that all cross-connections have been eliminated.

7. Obtain approval from the Recycled Water Agency and the local city or county Health Department before returning the recycled water system to service.

8. If the bacteriological analysis conducted in Step 4 is positive, flush the potable water system and disinfect by maintaining a chlorine residual of at least 50 mg/L for 24 hours. Otherwise proceed to Step 11.

9. Flush the potable water system after 24 hours and perform standard bacteriological analysis.

10. If the results from Step 9 are acceptable, proceed to Step 11. Otherwise, repeat Steps 8-9.

11. Obtain final approval from the Recycled Water Agency and the State, local city or county Health Department before removing signs.

SECTION F REUSE SITE PRESSURE-TESTING PROCEDURE

The following are general guidelines for the testing procedure and may be modified with the approval of the State, local city or county Health Department.

1. Potable water must be used during the initial testing of the on-site recycled water system, with the potable water supply separated from the proposed recycled water system by an approved reduced pressure principle backflow prevention assembly until the system has been checked for cross-connections.

2. The recycled water system should be completely drained and remain deactivated for an adequate period of time based on site-specific characteristics.

3. At the end of the shutdown period, all of the recycled water outlets should be tested throughout the entire site for cross-connections by checking each outlet for flow.

4. The recycled water system should then be checked at the quick couplers (located on the normally pressurized main irrigation line) or by cycling the irrigation clocks (observing the spray decrease) to determine if there is any flow. If there is no flow detected in any of the outlets that would suggest a cross-connection, the recycled water connection may then be reactivated.

5. The potable water to the use site will be shut off at the potable water meter. The potable water system must be completely drained and remain deactivated for an adequate period of time based on site-specific characteristics.

6. At the end of the shutdown period, all of the use site's potable water fixtures should be tested for cross-connections by operating each fixture and checking for flow.

7. The potable water inlet should then be checked to detect if there is backpressure or significant backflow. If no flow is detected at the inlet or in any of the fixtures that would suggest a cross-connection, the potable water connection may then be reactivated.

SECTION G SAMPLE FORMS AND SITE SPECIFIC DETAILS

SUMMARY OF STEPS TO OBTAIN RECYCLED WATER

NOTE: The following sequence of events is general in nature and is for illustration only. Please check with your Recycled Water Agency for the appropriate process.

Potential User contacts the Recycled Water Agency for recycled water service, and the Agency responds in a timely manner.

Potential User must have irrigation plans stamped by a registered landscape architect or a registered civil engineer.

Potential User submits a recycled water application (an example is shown on page 33) and pays the application fee. The User agreement is explained and signed at this time.

The potential User shall apply to the Recycled Water Agency for a recycled water meter. A construction meter for potable water and an appropriate backflow prevention device may be required for temporary water and system testing before being served recycled water.

Recycled Water Agency notifies the State, local city or county Health Department of the submitted application.

Potential User submits two sets of plans each to the Recycled Water Agency and to either State DHS or the local city or county Health Department for plan check, and pays the applicable plan check fees.

Recycled Water Agency, State DHS, and the local city or county Health Department complete plan check and return plans to the potential User for corrections.

After all corrections are made the potential User resubmits the marked plan checked prints along with a final set of plans. If no more corrections are to be made, the Recycled Water Agency, State DHS, and the local city or county Health Department will approve the original plans. Four (4) sets of prints of the signed plans each should be submitted to these agencies.

A pre-job meeting (preliminary inspection) is held before construction with the Recycled Water Agency's representative, potential User and the contractor. This meeting is to cover the plan's general notes, specific job requirements and cover any questions. Following this meeting, an initial cross-connection test is to be conducted on existing systems with the state and/or city or county health agencies.

The potential User may begin construction, according to the approved plans, contingent upon any other required permits or approvals being obtained. Approvals for deviations in the approved plans are to be sought as they occur.

All work during construction must be inspected by the Recycled Water Agency and/or the local city or county Health Department **before** backfilling any buried piping. If any reclaimed or potable water piping is installed before plan check approval and/or inspection, all or any portion of the piping system may be required to be exposed and corrected as necessary.

After construction is completed, the Recycled Water Agency and either State DHS or the local city or county Health Department must be notified for the final inspection and cross-connection test utilizing potable water supplied through an approved backflow prevention device on dual source sites. The recycled water meter is installed, potable water severed and conversion made to recycled water. During this walk through flow adjustments are made, tagging is inspected, and coverage is checked. A thorough cross-connection test is conducted at this time to verify that construction was performed correctly. The Recycled Water Agency and/or the local city or county Health Department will generate a punch list of corrections to be made if necessary.

A follow-up walk through will be called for after all corrections from the first walk-through are completed if required. This walk-through will inspect to see that all corrections are complete, including color-coded plans for each controller that are accurate and placed at each controller cabinet. Upon the successful completion of the inspection and cross-connection tests, the User will be granted permission for the normal operation of the system. At this time the Recycled Water Agency's inspector will discuss with the User and the User's Site Supervisor conditions for operation, inspections etc.

LOCAL CONTACTS

SITE: _____

LOCATION: _____

_____

SUPERVISOR: _____ **PHONE:** _____

RECYCLED WATER AGENCY CONTACTS

WATER OPERATIONS: _____ **PHONE:** _____

SUPERVISOR: _____ **PHONE:** _____

RECYCLED WATER INSPECTOR: _____ **PHONE:** _____

RECYCLED WATER AGENCY'S ENGINEER: _____ **PHONE:** _____

RECYCLED WATER IRRIGATION USER APPLICATION

Today's Date: _____
Tract No. _____ Project Name: _____
Location: _____ or Brief Legal Description: _____

_____

Type of Development:

_____

Description of proposed uses of recycled water:

_____

Expected date to commence recycled water service (Month/Year) _____
Estimated Water Requirements:

	Acres	Average AF/YR)	Peak Demand (GPM)
Landscape Irrigation:	_____	_____	_____
Park:	_____	_____	_____
Open Space:	_____	_____	_____
School:	_____	_____	_____

Owner: _____
Address: _____
City: _____
State: _____ Zip: _____
Phone: (____)_____
Contact: _____

Engineer:_____
Address: _____
City:_____
State: _____Zip: _____
Phone: (____)_____
Contact: _____

RECYCLED WATER - SITE INSPECTION REPORT

Site:_____ Date:_____

Inspected By:

Title: _____ Agency:_____

AREA INSPECTED	NO	YES
- PIPING -		
Piping properly marked?	___	___
Valves etc. properly marked?	___	___
Has piping been modified?	___	___
If yes, are modifications approved?	___	___
Points of connection properly marked?	___	___
Piping System "Leak"?	___	___
- SIGNING -		
Are all signs properly placed?	___	___
Are all signs legible?	___	___
Are tags visible and legible?	___	___
- BACKFLOW PREVENTION -		
Backflow Prevention Device installed?	___	___
Does the device appear damaged?	___	___
Is the device leaking?	___	___
Is the device unobstructed?	___	___
Is Recycled Water being used for its approved purpose?	___	___

Comments:_____

Signed:_____ Date:_____

CROSS-CONNECTION TEST NOTIFICATION FORM

Test Date: _____ Test Time: _____

Site Name: _____

Site Address: _____

_____

_____

Recycled Water Agency:

_____

Contact Person: _____ Phone: _____

Agencies Notified: California Department of Health Services, Drinking Water Field Operations Branch

_____

_____

_____

_____

CROSS-CONNECTION NOTIFICATION RSVP FORM

Site Address: _____

_____

Test Date: _____

Agency/Company: _____

Representatives Attending: _____

_____

(Please return to requesting party within 10 days of scheduled test)

SECTION F LOCAL GOVERNING AGENCIES

(Local Recycled Water Agency to insert own name, address, phone number, and modify contact information below for its own region)

Regional Water Quality Control Board
Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, CA 90013
(213) 576-6600

County of Los Angeles Department of Health Services
Cross Connection and Water Pollution Control
5050 Commerce Drive
Baldwin Park, CA 91706
(626) 430-5290

State of California Department of Health Services
Drinking Water Field Operations Branch
1449 West Temple Street
Los Angeles, CA 90026
(213) 580-5723

SECTION G DEFINITIONS

Whenever the following terms, or pronouns used in their place, occur in this Manual the intent and meaning shall be interpreted as follows:

Air Gap Separation – A physical break between a water line and a receiving tank or reservoir which is at least double the diameter of the pipeline vertically above the rim of the tank or reservoir, and in no case less than one-inch.

Applicant – An Owner or authorized representative of a potential reuse site who applies for recycled water service under terms of the appropriate regulations. An approved Applicant becomes a User.

Approved Backflow Prevention Assembly – A device installed to protect the potable water supply from contamination by nonpotable water and is approved by the State of California.

Approved Use – An application of recycled water in a manner, and for a purpose, designed in a user agreement issued by the Recycled Water Agency and in compliance with all applicable Regulatory Agency requirements.

Approved Use Area – A site with well-defined boundaries, designated in a user agreement issued by the Recycled Water Agency to receive recycled water for an approved use and acknowledged by all applicable Regulatory Agencies.

Chief Executive Officer – The highest-ranking management official of the Recycled Water Agency.

Construction Use – An approved use of recycled water to support approved construction activities, such as soil compaction and dust control during grading.

Cross-Connection – Any physical connection between any part of a water system used or intended to supply water for drinking purposes and any source or system containing water or substance that is not or cannot be approved as safe, wholesome and potable for human consumption.

Graywater – Untreated domestic wastewater from bathtubs, showers, bathroom wash basins, clothes washing machines, and laundry tubs, but excluding toilets, kitchen sinks, dishwashers, photo development sinks and laundry water from soiled diapers. This is **not** the same as treated recycled water.

Infiltration Rate – The rate at which the soil will accept water as applied during irrigation, expressed in inches per hour.

Inspector – Any person authorized by the Recycled Water Agency or the local health agencies to perform inspections on or off the Users site before construction, during construction, after construction and during operation.

Irrigation Period – The time, from start of water flow to end, which a specific area receives recycled water by direct irrigation application, no matter how often the specific area is irrigated - that is length of the duty cycle.

Irrigation Use – An approved use of recycled water for landscape irrigation as defined for recycled water under Title 22, Chapter 3 of the California Code of Regulations.

Landscape Impoundment – An open body of recycled water on a use site that is utilized for aesthetic enjoyment or which otherwise serves a function not intended to include public contact.

Local City or County Health Department – This agency is the local health protection agency for the municipality in question.

Nonpotable Water – The water that has not been treated for human consumption in conformance with the latest edition of the United States Environmental Protection Agency's Drinking Water Standards, the California Safe Drinking Water Act, or any other applicable standards. This also refers to irrigation or industrial process water derived from a potable water system through an approved backflow prevention device that may be subject to contamination (e.g., through back-siphonage).

Off-site – Designates or relates to recycled water facilities up to and including the water meter that are owned and operated by the Recycled Water Agency.

On-site – Designates or relates to facilities owned and operated by a User.

Operations Personnel – Any employee of a User, whether permanent or temporary, or any contracted worker whose regular or assigned work involves the supervision, operation or maintenance of equipment on any portion of on-site facilities using recycled water.

Operator – Any person, persons or firm, who by entering into an agreement with a User is responsible for operating on-site facilities.

Owner – Any holder of legal title, contract purchaser, or lessee under a lease with an unexpired term of more than one (1) year, for property for which recycled water service has been requested or established.

Point of Connection – This is the point where the User's system ties to the Recycled Water Agency's system, usually at the water meter.

Ponding – Unintentional retention of recycled water on the surface of the ground or other natural or manmade surface for a period following the cessation of an approved recycled water use activity such that a hazard or potential hazard to the public health results.

Potable Water – That water that is pure and wholesome, does not endanger the lives or health of human beings, and conforms to the latest edition of the California Safe Drinking Water Act, or other applicable standards.

Public – Any person or persons at large who may come in contact with facilities and/or areas where recycled water is approved for use.

Rate and Fee Schedule – The schedule of all rates, charges, fees and assessments to be made concerning the use of recycled water served by the Recycled Water Agency as approved or as amended by the Recycled Water Agency.

Note: If the recycled water provided by an investor-owned utility functioning as the Recycled Water Agency, rates and fees are approved or amended by the California Public Utilities Commission.

Recreational Impoundment – An open body of recycled water located on a use site that may be used for unrestricted body contact (e.g., swimming, wading) or restricted non-body contact (e.g., boating, fishing) recreation.

Recycled Water – Nonpotable water that is highly treated to the California Code of Regulations, Title 22, Chapter 3 and used for approved purposes other than drinking water.

Recycled Water Agency – The local purveyor or producer of recycled water for the specified service area (public or private).

Regulatory Agencies – Those public agencies legally constituted to protect the public health and water quality, such as the State Department of Health Services, the California Regional Water Quality Control Board and the local city or county Health Department.

Runoff – When recycled water is intentionally or unintentionally allowed to drain outside the approved recycled water irrigation area.

Service – The furnishing of recycled water to a User through a metered connection to the on-site facilities.

Site Supervisor – A qualified person designated by the User to provide liaison with the Recycled Water Agency. This person should be available to the Recycled Water Agency at all times, should have the knowledge and authority to carry out any requirements of the Recycled Water Agency, and should be responsible for the installation, operation and maintenance of the reclaimed and potable water systems and also prevention of potential hazards.

State Department of Health Services – Shall be the State of California Department of Health Services, Drinking Water Field Operations Branch.

Unauthorized Discharge – Any release or spill of recycled water that violates the rules and regulations of the Recycled Water Agency or all applicable Federal, State or local statues, regulations, ordinances, contracts or other requirements.

User – Any person, persons or organization (including, but not limited to, any private company or corporation, public utility, municipality or other public body or institution) issued a recycled water Users' Permit by the Recycled Water Agency. The User and Owner may be the same.

User Agreement – An agreement issued by the Recycled Water Agency to a recycled water service Applicant after the satisfactory completion of the service application procedures. This Agreement forms a service agreement between the User and the Recycled Water Agency that legally binds the User to all conditions stated in the Agreement and all applicable Regulatory Agency requirements.

User Agreement (For Users Served by an Investor-Owned Utility) – An agreement shall consist of the signed Application, the User Manual, a copy of the applicable Regional Water Quality Control Board water recycling permit and the California Public Utilities Commission approved Tariff Schedules. These form a service agreement between the User and the Recycled Water Agency that legally binds the User to all conditions stated in the Agreement and all applicable Regulatory Agency requirements.

Violation – Noncompliance with any condition or conditions of the User Agreement, water recycling requirements issued the Regional Water Quality Control Board and/or Title 22, Chapter 3 of the California Code of Regulations by any person, action or occurrence, whether willfully or by accident.

Windblown Spray – Dispersed, airborne particles of recycled water that can be transmitted through the air to locations other than those approved for the direct use of recycled water.

SECTION H TIPS FOR SUCCESSFUL USAGE

The recycled water that is delivered for beneficial reuse has been "manufactured" at a water reclamation plant, resulting in a quality that meets very strict DHS standards for safety. Even though it is virtually impossible to distinguish the recycled water, as described in this Manual, from potable water supplies. However, there are general chemical differences that may require Users to make changes in their landscaping practices. The following few pages is not meant to be a comprehensive discussion of issues that might arise when irrigating with recycled water; but only the most common areas of concern.

SALT LEVELS

Salt is a difficult and expensive constituent to remove from water; consequently, it and other minerals that are not often removed by conventional treatment processes. The salinity, or salt levels in recycled water can vary from treatment plant to treatment plant, but are generally higher than the local domestic water supply. Therefore, Users may want to carefully consider their selection of plants, soil composition and irrigation practices.

Type of Plants

For the most part, turf grass is very tolerant of higher salt levels, as are many ornamental trees and shrubs. Additionally, experience has shown that most flowering plants thrive with the use of recycled water.

However, not all landscape plants are suitable for irrigation with recycled water. Most notable of these are azaleas, which are very salt **intolerant** and should be avoided when using recycled water.

Soil Types

The type of soil present at a User's site strongly influences how the salt in the recycled (or any) water affects plant growth and health. Well draining soil is preferable; however, many areas have a clay component in their soil. Clay tends to hold on to salt, and can actually cause the soil to stop draining altogether. This particular phenomenon is the direct result of elevated levels of sodium and is measured by its ratio to calcium and magnesium (Sodium Adsorption Ratio, or SAR). The presence of self-regenerating water softeners that discharge sodium-laden brine into the sewer system are big contributors to elevated sodium levels in the recycled water.

Problems with soil drainage due to clay soils and an elevated SAR can be rectified by the application of gypsum (calcium), which loosens the bound up clay and allows for water to drain through the soil.

However, when dealing with clay soil drainage issues, some recycled water users have rejected gypsum as it increases the salinity and instead opted for an acid injection system. Buffered acid can be added to break up the bicarbonate binding and salt buildup at the surface level in clay soils and allow improved penetration to the root zone.

Irrigation Schedule

Many irrigation systems schedule watering for short periods of time, perhaps many nights a week. Depending on the levels of salt in the recycled water

and the soil type (sand vs. clay), a switch to longer irrigation run times done on a less frequent basis may be called for. Short irrigation runs have the potential to deposit more salt in the root zone, with possible adverse impacts on plant health and growth. Clay soil is more susceptible to this phenomenon than better-draining soils. Heavier watering done less frequently leaches the accumulating salts out of the root zone. .

This is particularly important in regions of the state that don't experience sufficient precipitation during the rainy season. Rainfall can have the same effect as longer watering periods, if the rainstorms are heavy enough. Periods of drought can exacerbate the build-up of salts further but can be answered with a modified irrigation schedule.

NUTRIENTS

Recycled water may also contain higher nutrient levels such as nitrogen, phosphorous and potassium, which are essential components for plant growth. Some treatment processes may reduce the levels of these chemicals, although they are not totally removed.

Fertilizer Value

While nutrient levels vary among treatment plants, there are sufficient levels of nitrogen, phosphorous and potassium in the recycled water to provide fertilizer value to the landscaping each and every time irrigation takes place. Based on nutrient levels in the recycled water being supplied, a Site Supervisor can readily calculate the number of pounds of each constituent being delivered. He or she can then determine how much, if any, and what kind of additional fertilizer needs to be applied.

A common mistake is to continue the same fertilizer application schedule that was in place when domestic water was being used for irrigation. The addition of applied fertilizer, on top of the extra nutrients in the recycled water, can cause problems with plant health, groundwater quality problems and avoidable costs to the site in buying and using unnecessary fertilizer.

Ornamental Lakes

Some reuse sites have ornamental lakes as part of the landscaping. Care must be exercised if recycled water is used to supply these lakes. The nutrient value in the recycled water readily promotes the growth of algae, which can impair the aesthetics of these lakes. This is especially a problem in lakes that are less than 10 feet deep, due to sunlight penetration.

Several different strategies have been employed at such lakes, with the greatest level of success in algae control coming from combinations of two or more of the following methods.

- Pumping the recycled water from the lake into the irrigation system reduces the amount of time the water (and the nutrients it contains) spends in the lake, consequently reducing algae production.
- Re-circulating the water by means of fountains or waterfalls or installing more extensive aeration systems.
- Preventing the introduction of organic material (such as grass clippings) from entering the lake.

- Stocking the lake with algae eating fish, such as Tilapia (?). However, some fish, like koi, react unfavorably to the higher ammonia levels that may be in the recycled water.
- Using a chemical product, such as Aqua-Shade, to prevent sunlight from penetrating the water column.
- Using a chemical algaecide, such as copper sulfate. (Warning: This product is also toxic to other organisms, so the lake water could not be used for landscape irrigation.)
- Because refilling ornamental lakes may not be a significant consumptive use of the recycled water, in some cases it may be preferable to fill the lakes with potable water or even non-potable well water.

Increased Mowing

Reports from many turf sites using recycled water have reported the need to mow their grass more often. This is the direct result of the additional nutrients in the recycled water being available for uptake by the grass.

APPENDIX I

CITY OF TORRANCE PERMIT AND BUSINESS LICENSE

City of Torrance, Community Development Department

Permit Application Form

3031 TORRANCE BLVD. • TORRANCE, CA 90503

OWNER/APPLICANT INFORMATION

Name:_____

Address:_____

City/State:_____

Zip:_____

Telephone:_____

Fax:_____

Excavation permits will not be issued without USA I.D. Number.

Underground Service Alert
Call: 811

USA I.D. #_____
Date Received:_____

CONTRACTOR INFORMATION

_____

_____

_____

_____

_____

_____

State License #:_____

Class:_____ Exp. Date:_____

City Business #:_____

CONTRACTOR: Certificate of Insurance REQUIRED prior to issuance of permit.

JOB LOCATION/ADDRESS (closest street address)

Please list cross streets:_____

_____

DESCRIPTION OF WORK

_____

_____

LF Trench_____ Width of Trench_____ LF Curb & Gutter_____

LF Bore_____ Sewer Connection_____ Number of Curb Drains_____

SF Asphalt_____ SF Concrete_____

Work Order Number (for utility companies):_____

Applicant or Authorized Signature:_____

For further permit information, please call 310-618-5898 or fax 310-618-2846.

Please call the Business License Office at 310.618.5928 for fee amounts. Payment must be submitted with your application.

FOR OFFICIAL USE ONLY

1. LICENSE NO. | 2. CATEGORY NO.

HOME OCCUPATION | HEALTH PERMIT | N.A.I.C.S. CODE

City of Torrance, Revenue Division
Business License Application

3031 Torrance Boulevard, Torrance, California 90503 • 310/618-5828

PART I. APPLICANT TO ANSWER ALL QUESTIONS IN THIS SECTION (print or type)

3. BUSINESS NAME OR DBA		4. CORPORATE NAME (IF DIFFERENT FROM ABOVE)		
5. BUSINESS ADDRESS	SUITE #	CITY	STATE	ZIP
6. MAILING ADDRESS	SUITE #	CITY	STATE	ZIP
7. NATURE OF BUSINESS (state type of business being conducted at this location)		8. NO. OF PERSONS WORKING AT LOCATION	9. BUSINESS PHONE	
10. NAME OF PERSON MAKING APPLICATION (must be an owner, partner or corporate officer)		11. TITLE	12. HOME PHONE	
13. RESIDENCE ADDRESS	CITY / STATE / ZIP	14. DRIVER'S LICENSE NO.	15. STATE SALES TAX NO.	
16. STATE CONTRACTOR'S LICENSE NO.	17. SQUARE FOOTAGE	18. SOCIAL SECURITY NO.	19. FED TAX ID#	20. STATE TAX ID#

21. OWNERSHIP INFORMATION

☐ PARTNERSHIP ☐ CORPORATION ☐ SOLE OWNERSHIP

NAMES OF OWNER, PARTNERS, OR PRINCIPAL OFFICERS	TITLE	HOME ADDRESS	HOME PHONE

I declare that I am the owner, partner, corporate officer or person with the power of attorney, and i understand if all the information provided above is not the true the business license being applied for may be revoked as outlined in section 31.9.10 of the Torrance Municipal Code.

I am duly authorized to make this application. All of the information provided in this application is true and correct. The business will not provide any service, good or product which is illegal under Federal, State, or Local Laws. I declare under penalty of perjury that the foregoing is true and correct.

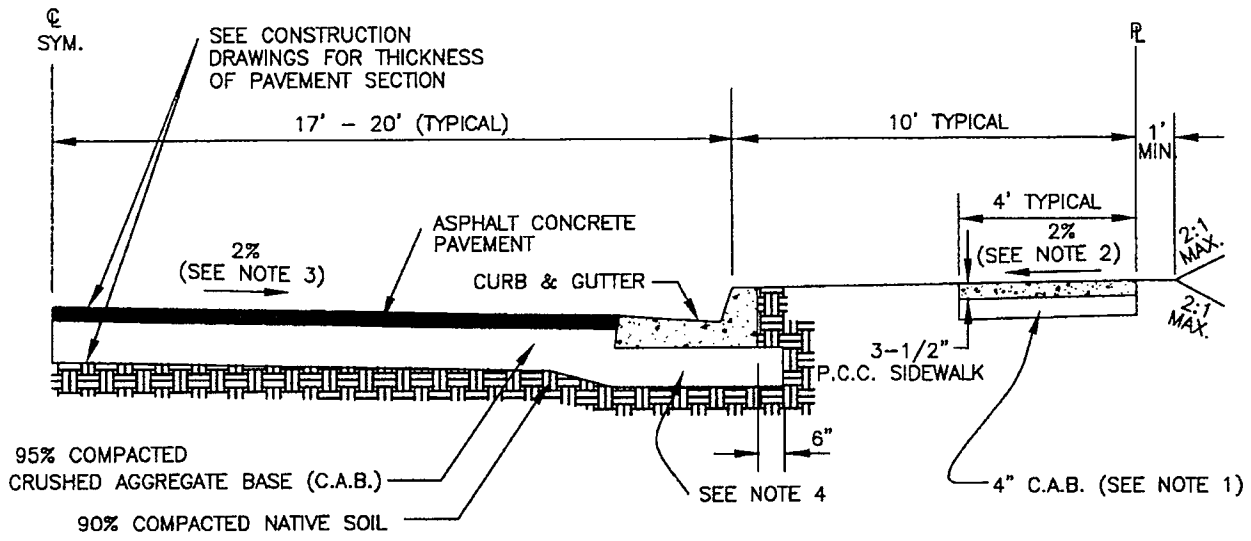
SIGNATURE _____ DATE _____

PART II. FOR OFFICIAL USE ONLY

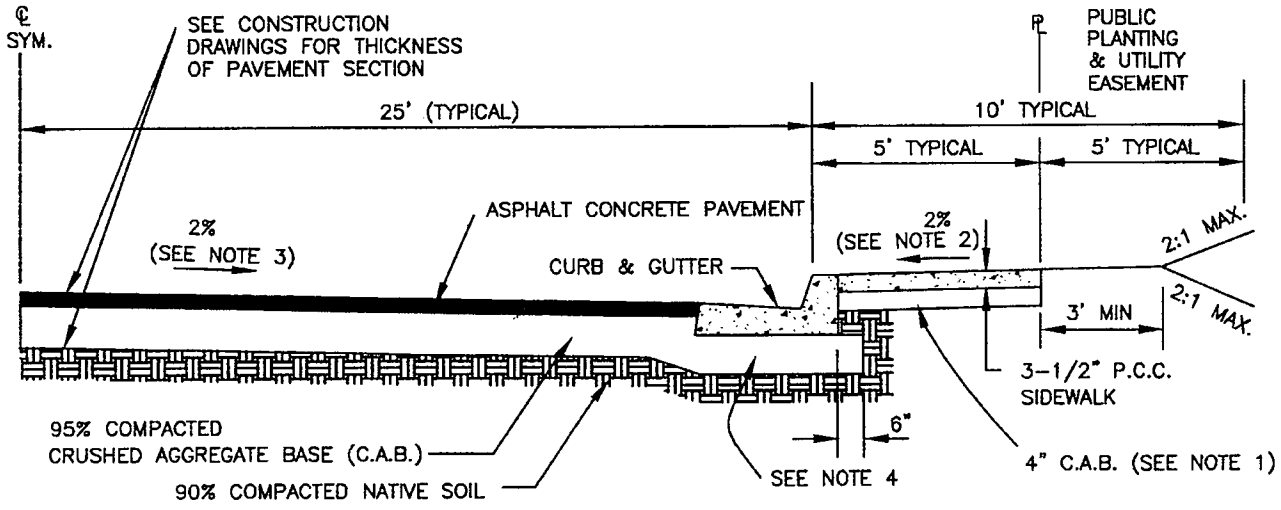
BASIC FEE	APPLICATION SENT FOR ZONING? ☐ YES ☐ NO	PROCESSING FEE	FIRE INSP. FEE	OTHER	
PER PERSON FEE	OTHER (cont'd)				
PENALTY FEE	HOLD ☐ YES ☐ NO	ENT. FEE	DANCE/PIANO FEE		
RECEIVED BY	DATE	CHECK NO.	BANK NO.	CASH	TOTAL AMOUNT $

APPENDIX II

CITY OF TORRANCE STANDARD PLANS



RESIDENTIAL STREET



INDUSTRIAL STREET

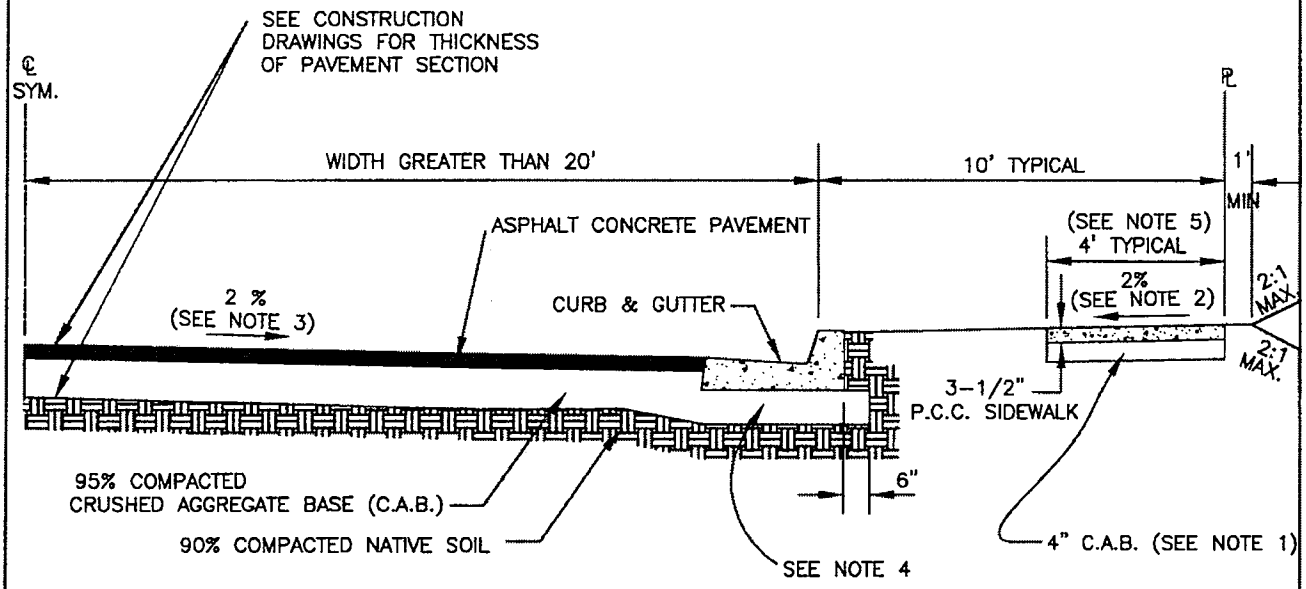
NOTES:

1. THE BASE MAY BE OMITTED UNDER SIDEWALK IF SUBGRADE IS SANDY SOIL.
2. TYPICAL – MAY VARY 0.5% MIN. TO 2.0% MAX TO MATCH EXISTING CONDITIONS AND TO FACILITATE JOINS.
3. TYPICAL – MAY VARY 1% MIN. TO 4.0% MAX TO MATCH EXISTING CONDITONS AND TO FACILITATE JOINS.
4. THICKNESS OF BASE REQUIRED UNDER CURB & GUTTER SHALL BE 8" ON CLAYEY SOILS AND 6" ON SANDY SOILS.

CITY OF TORRANCE - ENGINEERING DEPARTMENT

DATE ISSUED	TYPICAL SECTION LOCAL STREET	STANDARD NO.
16 NOV 1998	RICHARD W. BURTT ENGINEERING DIRECTOR R.C.E. NO. 32862	T102-2
		SHEET 1 OF 1

DV/TT/T102-2



COLLECTOR

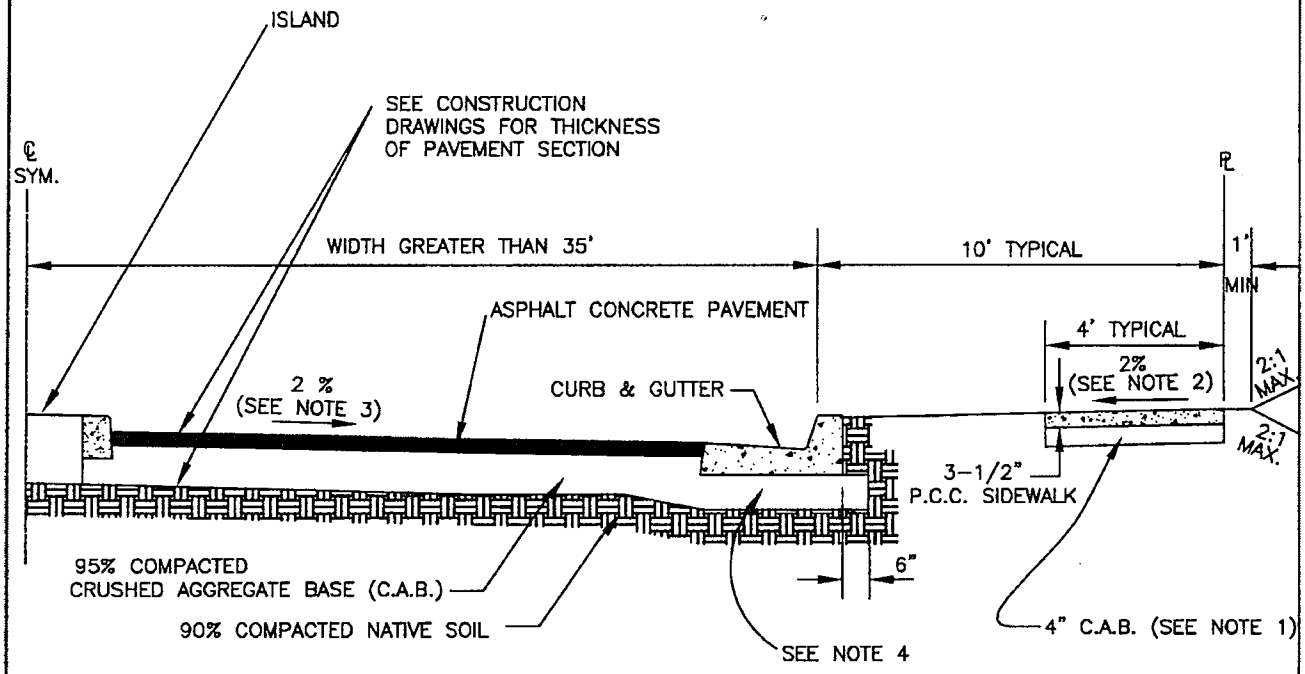
NOTES:

1. THE BASE MAY BE OMITTED UNDER SIDEWALK IF SUBGRADE IS SANDY SOIL.
2. TYPICAL – MAY VARY 0.5% MIN. TO 2% MAX TO MATCH EXISTING CONDITIONS AND TO FACILITATE JOINS.
3. TYPICAL – MAY VARY 1% MIN. TO 4.0% MAX TO MATCH EXISTING CONDITIONS AND TO FACILITATE JOINS.
4. THICKNESS OF BASE REQUIRED UNDER CURB & GUTTER SHALL BE 8" ON CLAYEY SOILS AND 6" ON SANDY SOIL.
5. IF SIDEWALK IS ADJACENT TO CURB, SIDEWALK WIDTH SHALL BE 5' MINIMUM AND HAVE 4' CLEAR AROUND ANY OBSTRUCTION. ALSO SEE T108 AND T109.

CITY OF TORRANCE - ENGINEERING DEPARTMENT

DATE ISSUED	TYPICAL SECTION COLLECTOR AND ARTERIAL STREET	STANDARD NO.
16 NOV 1998	RICHARD W. BURTT ENGINEERING DIRECTOR R.C.E. NO. 32862	T103-2 SHEET 1 OF 2

TT/T103-21



MINOR AND MAJOR ARTERIAL

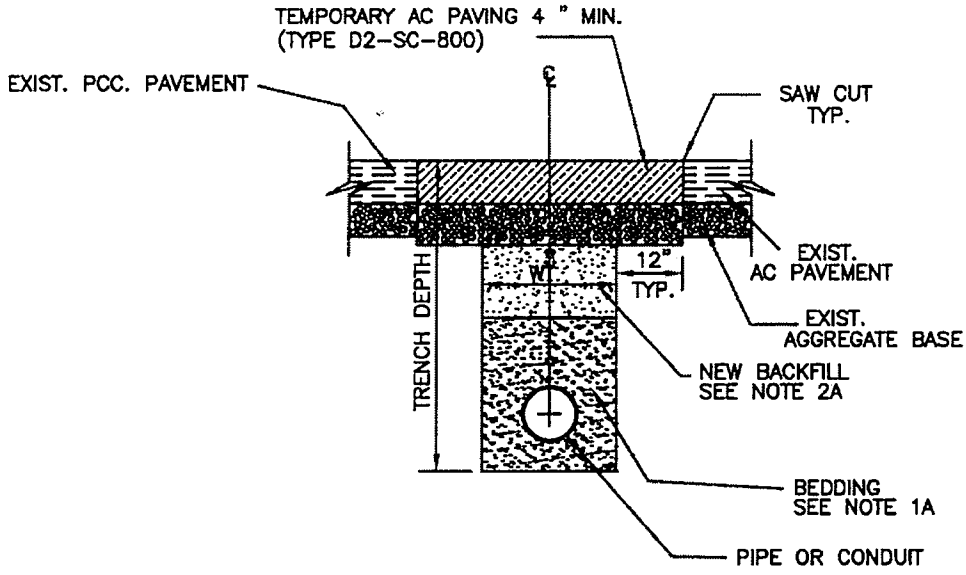
NOTES:

1. THE BASE MAY BE OMITTED UNDER SIDEWALK IF SUBGRADE IS SANDY SOIL.
2. TYPICAL – MAY VARY 0.5% MIN. TO 2% MAX TO MATCH EXISTING CONDITIONS AND TO FACILITATE JOINS.
3. TYPICAL – MAY VARY 1% MIN. TO 4.0% MAX TO MATCH EXISTING CONDITIONS AND TO FACILITATE JOINS.
4. THICKNESS OF BASE REQUIRED UNDER CURB & GUTTER SHALL BE 8" ON CLAYEY SOILS AND 6" ON SANDY SOIL.

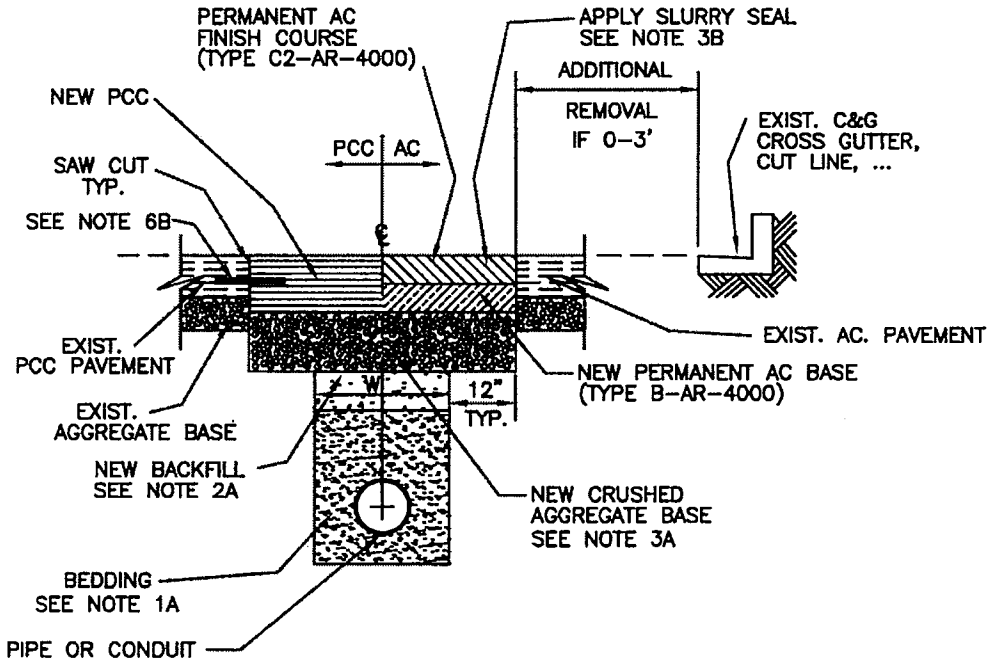
CITY OF TORRANCE - ENGINEERING DEPARTMENT

DATE ISSUED	TYPICAL SECTION COLLECTOR AND ARTERIAL STREET	STANDARD NO.
16 NOV 1998	RICHARD W. BURTT ENGINEERING DIRECTOR R.C.E. NO. 32862	T103-2 SHEET 2 OF 2

TT/T103-22



TEMPORARY ASPHALT REPAIR



PERMANENT TRENCH REPAIR

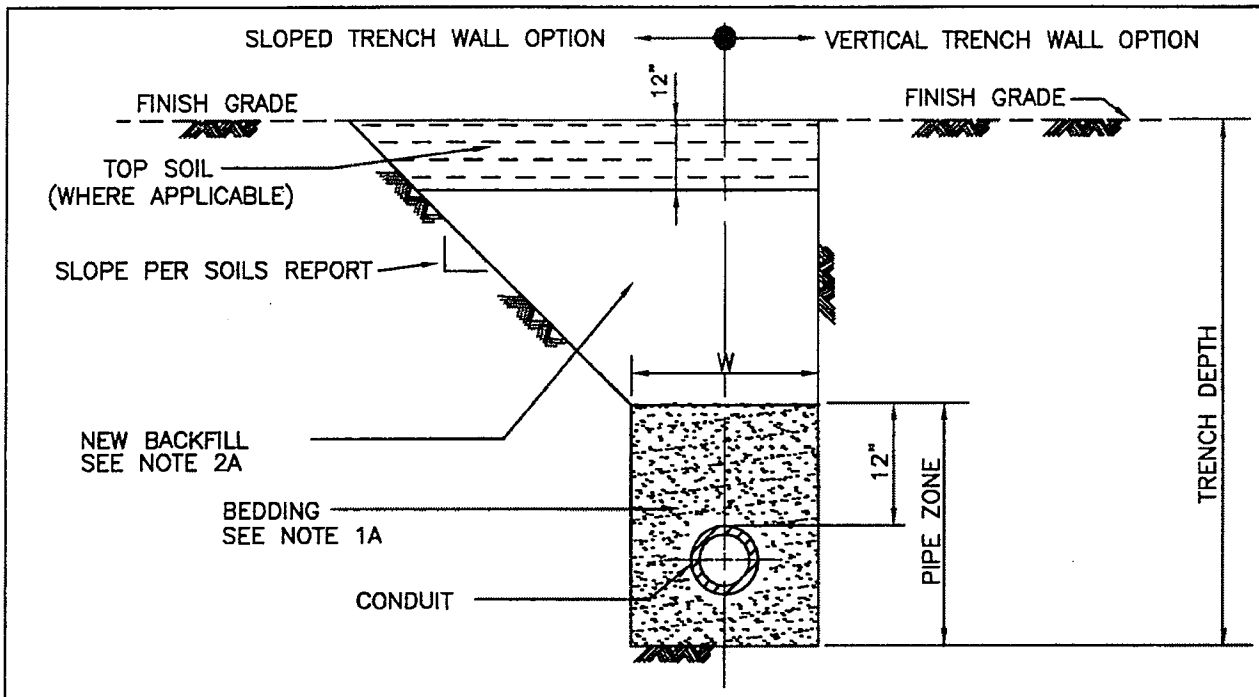
TYPICAL TRENCH SECTION WITHIN ROADWAY

(SEE NOTE 8C FOR EXCEPTION)

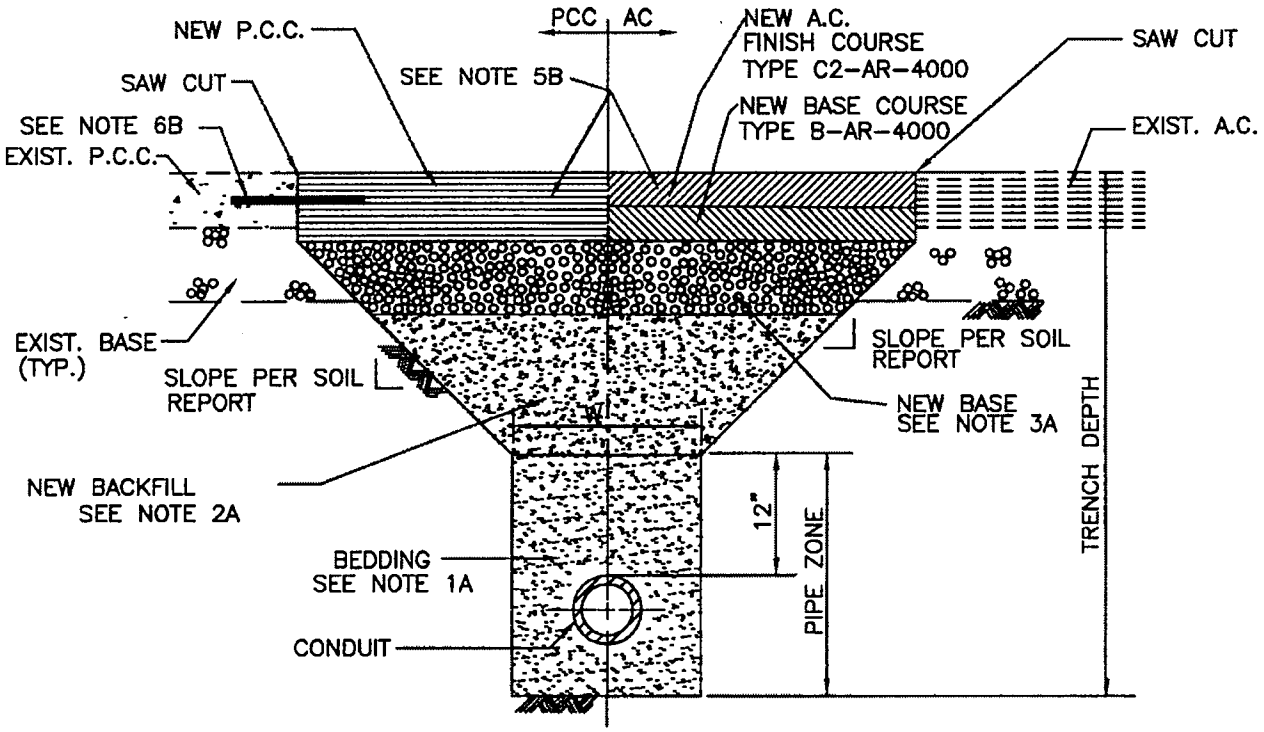
CITY OF TORRANCE - ENGINEERING DEPARTMENT

DATE ISSUED	TRENCH BACKFILL & PAVEMENT REPAIRS	STANDARD NO.
10 SEP 2002	RICHARD W. BURTT ENGINEERING DIRECTOR R.C.E. NO. 32862 R.T.E. NO. 1538	T116-2
		SHEET 1 OF 4

T:\T116-2



TYPICAL TRENCH SECTION OUTSIDE ROADWAY



TYPICAL TRENCH SECTION WITHIN ROADWAY
SLOPED TRENCH WALL OPTION

CITY OF TORRANCE - ENGINEERING DEPARTMENT

DATE ISSUED	TRENCH BACKFILL & PAVEMENT REPAIRS	STANDARD NO.
10 SEP 2002		T116-2
	RICHARD W. BURTT ENGINEERING DIRECTOR R.C.E. NO. 32862 R.T.E. NO. 1538	SHEET 2 OF 4

T:\T116-2

NOTES:

BELOW GROUND:

1A. SEE STD. PLAN NO'S T204, T302, AND T701 FOR BEDDING REQUIREMENTS.

2A. FOR TRENCHES WITH "W" GREATER THAN 2' OR IF TRENCH WALLS ARE SLOPED, BACKFILL SHALL BE CRUSHED AGGREGATE BASE, OR NATIVE OR OTHER EXCAVATION MATERIAL WITH AN SE VALUE OF 30 OR GREATER. BACKFILL MATERIAL SHALL BE DENSIFIED TO A RELATIVE COMPACTION OF 95% IN THE UPPER 3 FEET AND TO 90% BELOW THE UPPER 3 FEET. FOR TRENCHES LONGER THAN 200' OR LARGER THAN 1,000 SQUARE FEET A LICENSED SOILS ENGINEER SHALL BE PRESENT TO MONITOR THE NATIVE OR IMPORTED BACKFILL OPERATION AND TEST FOR COMPACTION AT 100' OR 200 SQUARE FOOT MAXIMUM INTERVALS

FOR TRENCHES WITH "W" LESS THAN OR EQUAL TO 2' IN THE ROADWAY, A SAND-CEMENT SLURRY (100-E-100) BACKFILL SHALL BE USED. SLURRY SHALL CURE 16 HOURS MINIMUM PRIOR TO BASE PLACEMENT. RAPID SET CEMENT SLURRY SHALL CURE 1 HOUR MINIMUM PRIOR TO BASE PLACEMENT.

IN AREAS NOT IN EXISTING ROADWAY, BACKFILL SHALL BE COMPACTED TO A RELATIVE COMPACTION OF 90%.

3A. NEW CRUSHED AGGREGATE BASE SHALL BE 2" THICKER THAN EXISTING BASE, BUT NOT LESS THAN 8" THICK.

4A. EXCAVATED MATERIAL NOT APPROVED FOR USE IN TRENCH BACKFILL SHALL BE REMOVED FROM JOB SITE UNLESS OTHERWISE USED IN THE WORK.

5A. WHERE WET, UNSTABLE OR RUNNING SOIL IS ENCOUNTERED, SOLID SHEATHING IS REQUIRED FOR ALL VERTICAL TRENCH WALLS.

6A. ANY SHORING REQUIRED SHALL BE DESIGNED BY A REGISTERED CIVIL OR STRUCTURAL ENGINEER.

7A. "W" SHALL BE MEASURED AT TOP OF BEDDING.

VISIBLE SURFACE:

1B. IF REMAINING AC PAVEMENT BETWEEN EDGE OF TRENCH AND EXISTING GUTTER, CURB, CROSS GUTTER, OR CUT LINE IS LESS THAN 3 FEET IN WIDTH, THEN THIS AC SHALL BE REMOVED AND REPLACED WITH NEW AC PAVEMENT.

2B. THE ENGINEER MAY REQUIRE WIDER REMOVAL AREA THAN THAT SHOWN ABOVE TO SUIT FIELD CONDITIONS.

3B. CRACKS SHALL BE SEALED AND A TYPE 2 SLURRY SEAL COATING WITH 2% LATEX SHALL BE APPLIED FROM LANE LINE TO LANE LINE FOR LONGITUDINAL TRENCHES GREATER THAN 200' IN LENGTH FOR ANY LANE AFFECTED.

4B. THE THICKNESS OF REPLACEMENT ASPHALT SHALL BE A MINIMUM OF 1" GREATER THAN EXISTING AC (2" GREATER IF EXISTING STREET IS PAVED WITH RUBBERIZED AC) BUT NOT LESS THAN 4" (5" FOR RUBBERIZED AC). IF EXISTING PAVEMENT IS PCC, REPLACEMENT CONCRETE SHALL BE AS PER SECTION 201.1 OF THE STANDARD SPECS AND 1" THICKER THAN EXISTING.

CITY OF TORRANCE - ENGINEERING DEPARTMENT

DATE ISSUED	TRENCH BACKFILL & PAVEMENT REPAIRS	STANDARD NO.
10 SEP 2002	RICHARD W. BURTT ENGINEERING DIRECTOR R.C.E. NO. 32862 R.T.E. NO. 1538	T116-2
		SHEET 3 OF 4

T:\T116-2

5B. THE NEW FINISH COURSE SHALL BE PLACED FLUSH WITH THE EXISTING ADJACENT PAVING SURFACE – MAXIMUM VARIANCE FROM FLUSH IS 1/8". NEW AC PAVEMENT ADJACENT TO EXISTING EDGE OF PCC GUTTER SHALL BE 3/8" HIGHER THAN EDGE OF GUTTER.

6B. FOR PCC ROADWAY PAVEMENT, DOWEL AT 24" O.C., #4 DEFORMED BAR, 6" EMBEDMENT, AND CENTERED IN EXISTING SLAB WITH 1–1/2" MINIMUM CONCRETE COVER. DOWEL SHALL BE EPOXIED IN EXISTING SLAB AND CAST IN NEW SLAB.

METHODOLOGY:

1C. AT THE END OF EACH WORK DAY, ANY TRENCH IN AN ARTERIAL OR IN ROLLING HILLS ROAD, MAPLE/235TH ST. OR ARLINGTON AVE. SHALL BE COVERED BY NON–SKID STEEL PLATES OR BE PAVED WITH TEMPORARY OR PERMANENT PAVEMENT FLUSH WITH ADJACENT PAVEMENT SURFACES. WHEN NON–SKID STEEL PLATES ARE USED, THEY SHALL BE WELDED, SECURED IN PLACE, RAMPED WITH AC, AND NOT USED FOR MORE THAN 48 CONSECUTIVE HOURS ON THE SAME SEGMENT OF TRENCH. "PLATE AHEAD" SIGN SHALL BE PROPERLY INSTALLED WHEN PLATES ARE IN USE. OTHER CITY STREETS MAY HAVE LESSER REQUIREMENTS AND WILL BE CONSIDERED ON A CASE BY CASE BASIS.

2C. ALL TRAFFIC LANES SHALL BE CLEANED AND RESTORED FOR USE IMMEDIATELY UPON PLACEMENT OF TEMPORARY AC PAVEMENT, TRENCH PLATES AND/OR FINAL AC PAVEMENT.

3C. ALL TRAFFIC STRIPING AND/OR MARKINGS REMOVED OR DAMAGED DURING CONSTRUCTION SHALL BE REPLACED IN KIND AS DIRECTED BY THE ENGINEER.

4C. TRAFFIC CONTROL SHALL BE PER CITY OF TORRANCE "CONSTRUCTION TRAFFIC CONTROL PROCEDURES ON CITY STREETS" AVAILABLE FROM THE ENGINEERING DEPARTMENT PERMIT COUNTER.

5C. MORITORIUM FOR CUTTING NEW OR RECONSTRUCTED STREETS IS 5 YEARS WITHOUT SPECIAL APPROVAL FROM THE ENGINEERING DIRECTOR. NEW UTILITY SERVICE CONNECTIONS AND SERVICE LINE REPAIRS ARE EXCEPTED IF NOT ABLE TO BE FORSEEN AT THE TIME THE ROADWAY WAS RECONSTRUCTED. APPROVED LONGITUDINAL EXCAVATIONS IN NEW STREETS SHALL REQUIRE THE FULL LANE TO BE GROUND AND OVERLAID.

6C. SLURRY SEALING OF TRENCH AREA MAY BE OMITTED IF PROJECT IS COORDINATED WITHIN ONE YEAR OF A CITY STREET REHABILITATION OR SLURRY SEAL PROJECT.

7C. A COLLECTION DEVICE SHALL BE USED TO COLLECT SEDIMENTS GENERATED DURING SAWCUTTING OPERATION.

8C. TRENCHES WITH "W" LESS THAN 8" WIDE AND LESS THAN OR EQUAL TO 24" DEEP ARE NOT REQUIRED TO USE T–SECTION PAVEMENT CONSTRUCTION, OR APPLY SLURRY SEAL.

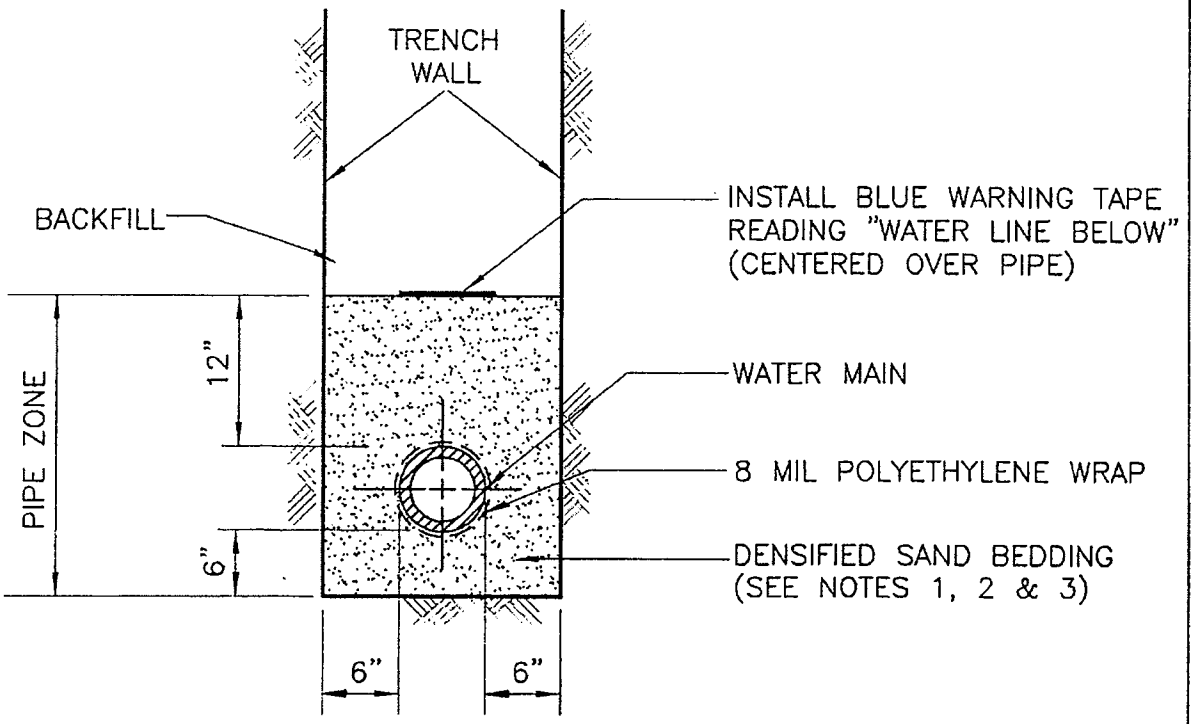
9C. ALL PAVEMENT REMOVALS SHALL USE STRAIGHT LINE SAW CUTS A MINIMUM OF 1.5" DEEP.

10C. BORING SHALL BE CONSIDERED AS A CONTINUOUS TRENCH AS FAR AS EXCAVATION REPAIR. POTHOLES LOCATED INTERMITTENTLY WILL NOT BE TREATED AS SEPARATE EXCAVATIONS BUT AS A CONTINUOUS EXCAVATION. THE CITY SHALL RESERVE THE RIGHT TO REQUIRE BORING OR OPEN TRENCH AS THE SITUATION MAY ARISE.

CITY OF TORRANCE - ENGINEERING DEPARTMENT

DATE ISSUED	TRENCH BACKFILL & PAVEMENT REPAIRS	STANDARD NO.
27 SEP 2002		T116-2
	RICHARD W. BURTT ENGINEERING DIRECTOR R.C.E. NO. 32862 R.T.E. NO. 1538	SHEET 4 OF 4

T:\T116-2



NOTES:

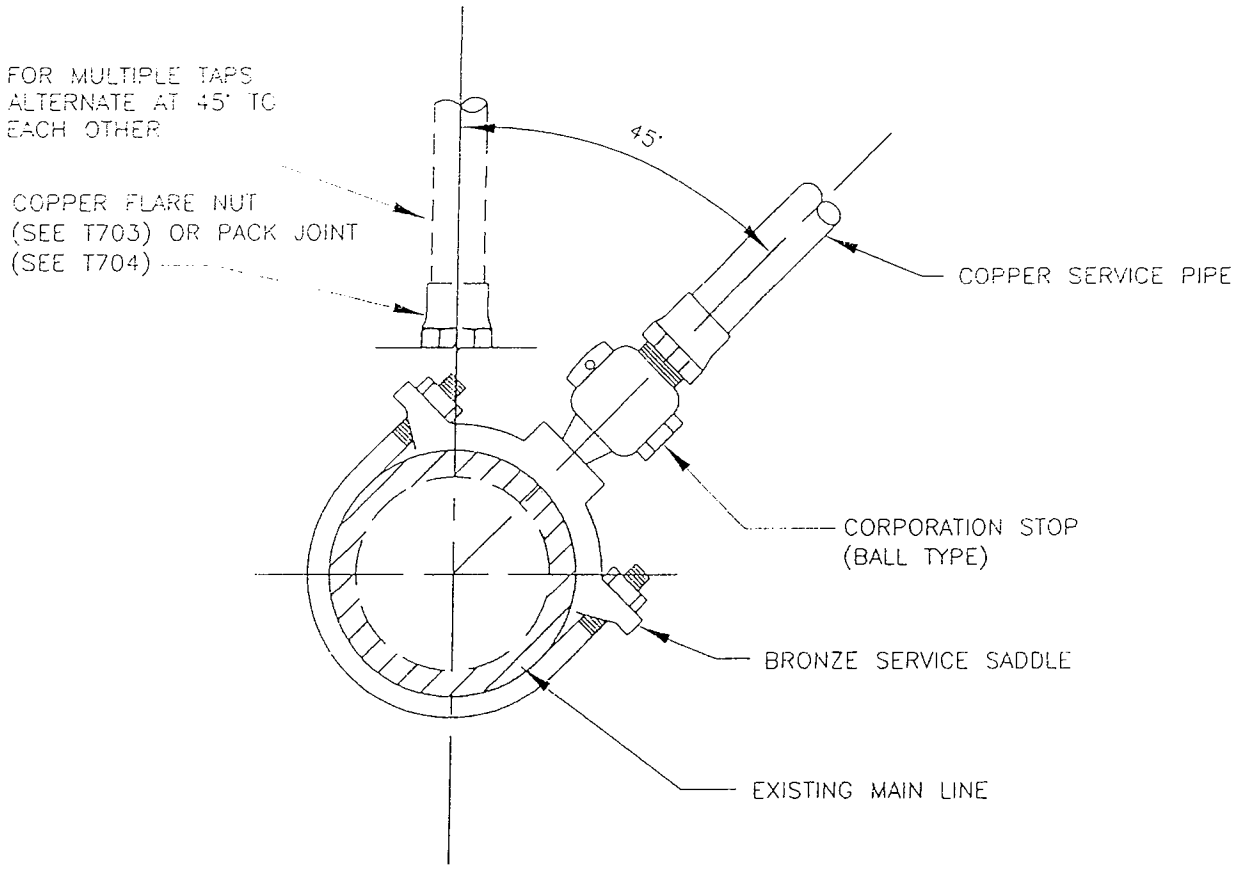
1. SAND BEDDING SHALL CONFORM TO SECTIONS 200-1.5.3 AND 200-1.5.5 OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (LATEST EDITION).
2. DENSIFICATION OF BEDDING SHALL BE ACCOMPLISHED IN CONFORMANCE WITH 306-1.2.1 OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (LATEST EDITION).
3. BEDDING SHALL BE COMPACTED TO 95% OF MAXIMUM DENSITY UNDER STRUCTURES AND 90% ELSEWHERE.

ACCOMPANYING STD.'S T700 AND T116

CITY OF TORRANCE

DATE ISSUED	BEDDING FOR WATER PIPE	STANDARD NO.
JAN 2011	ROBERT J. BESTE PUBLIC WORKS DIRECTOR R.C.E. NO. 50737	T 701
		SHEET 1 OF 1

DV/EM/T701-1



NOTES:

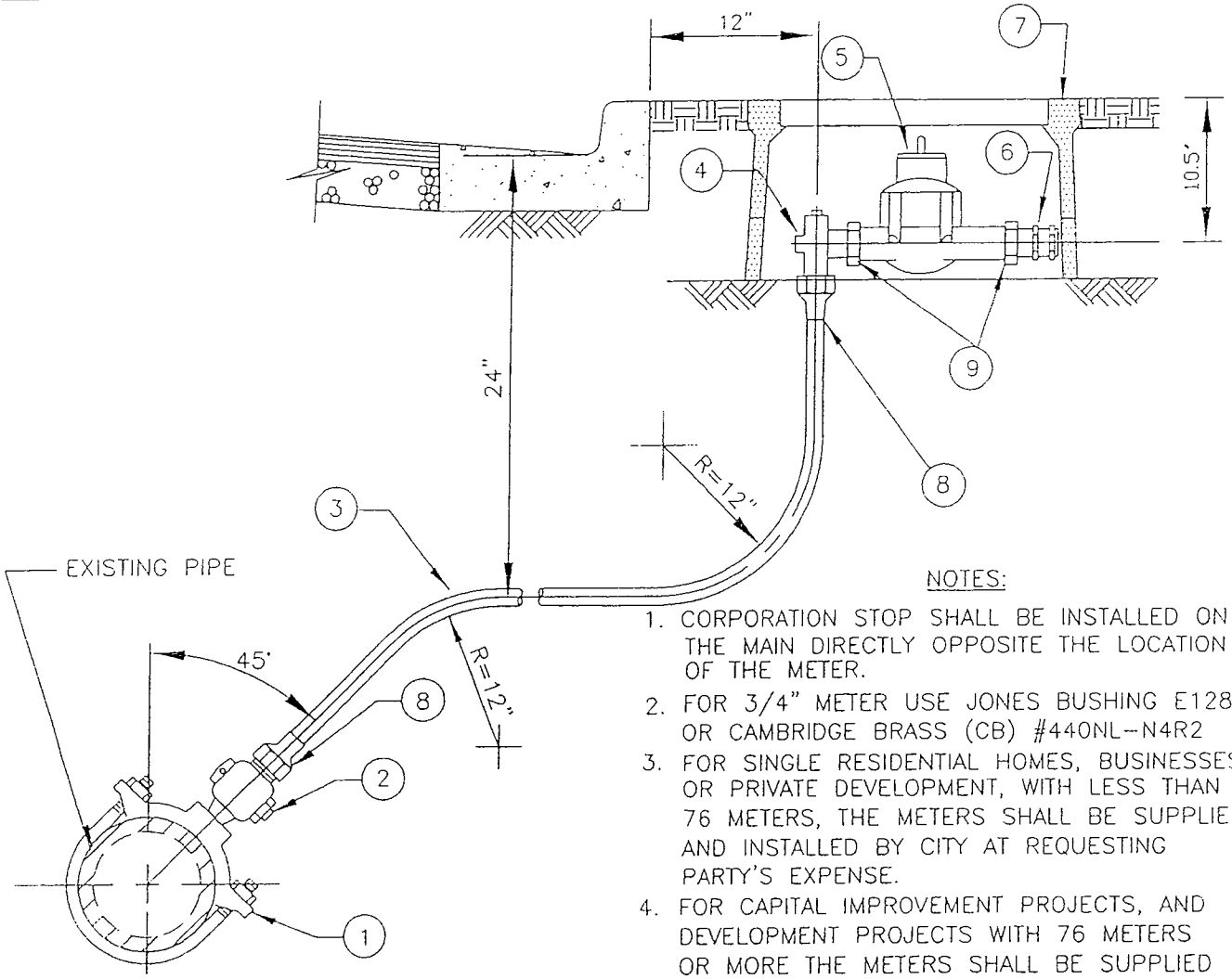
1. MINIMUM DISTANCE BETWEEN TAPS OR CONNECTIONS SHALL BE 20 INCHES, AND A MINIMUM OF 18 INCHES FROM END OF PIPE.

2. FOR STEEL MAINS DELETE SERVICE SADDLE. A TAP NOZZLE SHALL BE WELDED TO MAIN AND AN INSULATING BUSHING SHALL BE INSTALLED BETWEEN THE TAP NOZZLE AND THE CORPORATION STOP. FOR PIPES WITH WALL THICKNESS THINNER THAN 16 GAUGE A REINFORCEMENT COLLAR PLATE OR FULL WRAP REINFORCEMENT PLATE SHALL BE INSTALLED AS DETERMINED BY THE ENGINEER.

ACCOMPANYING STD.'S T700 AND T703 OR T704.

CITY OF TORRANCE

DATE ISSUED	1" & 2" SERVICE CONNECTION TO MAIN LINE	STANDARD NO.
JAN 2011	ROBERT J. BESTE PUBLIC WORKS DIRECTOR R.C.E. NO. 50737	T 702 SHEET 1 OF 1



NOTES:

1. CORPORATION STOP SHALL BE INSTALLED ON THE MAIN DIRECTLY OPPOSITE THE LOCATION OF THE METER.
2. FOR 3/4" METER USE JONES BUSHING E128H OR CAMBRIDGE BRASS (CB) #440NL-N4R2
3. FOR SINGLE RESIDENTIAL HOMES, BUSINESSES, OR PRIVATE DEVELOPMENT, WITH LESS THAN 76 METERS, THE METERS SHALL BE SUPPLIED AND INSTALLED BY CITY AT REQUESTING PARTY'S EXPENSE.
4. FOR CAPITAL IMPROVEMENT PROJECTS, AND DEVELOPMENT PROJECTS WITH 76 METERS OR MORE THE METERS SHALL BE SUPPLIED AND INSTALLED BY CONTRACTOR AT CONTRACTOR'S EXPENSE

ACCOMPANYING STD.'S T700, T701, T702 AND T116

ITEM	DESCRIPTION	SIZE
1	SERVICE SADDLE-DOUBLE STRAP-BRONZE JONES 979, MCDONALD 3825, MUELLER BR2B, CAMBRIDGE BRASS #810 - CC THREAD	MAIN SIZE X 1"
2	CORPORATION STOP-JONES E1930, FORD FB600-4NL, MUELLER B25000N CAMBRIDGE BRASS 301INL-M7B7, MCDONALD 74701B	1"
3	COPPER TUBING-TYPE "K" SOFT	1"
4	ANGLE METER STOP-JONES E1964W, FORD BA23-444WNL, MUELLER B24255N CB 210NL-B7MF7, MCDONALD 74620	1" (SEE NOTE 2)
5	NEPTUNE T-10 WATER METER, E-CODER) R900i WITH STUBBY ANTENNA CU.FT. REGISTER	3/4" SL OR 1"
6	METER SWIVEL COUPLING - JONES E130, MCDONALD 74620 - FORD C38-23-2.5NL (3/4") - FORD C38-44-2.625NL (1")	3/4", 1"
7	METER BOX W/COVER -ARMORCAST	BOX#33 (A6000486) COVER #33 (A6000483-IT)
8	COPPER FLARE NUT	1"
9	NEOPRENE FULL FACE GASKET	

AREAS SUBJECT TO TRAFFIC LOADS SEE T-724

CITY OF TORRANCE

DATE ISSUED	TYPICAL 3/4" OR 1" METER (NON-TRAFFIC AREA) INSTALLATION WITH 1" SERVICE LINE	STANDARD NO.
JAN 2011	ROBERT J. BESTE PUBLIC WORKS DIRECTOR R.C.E. NO. 50737	T 703 SHEET 1 OF 1

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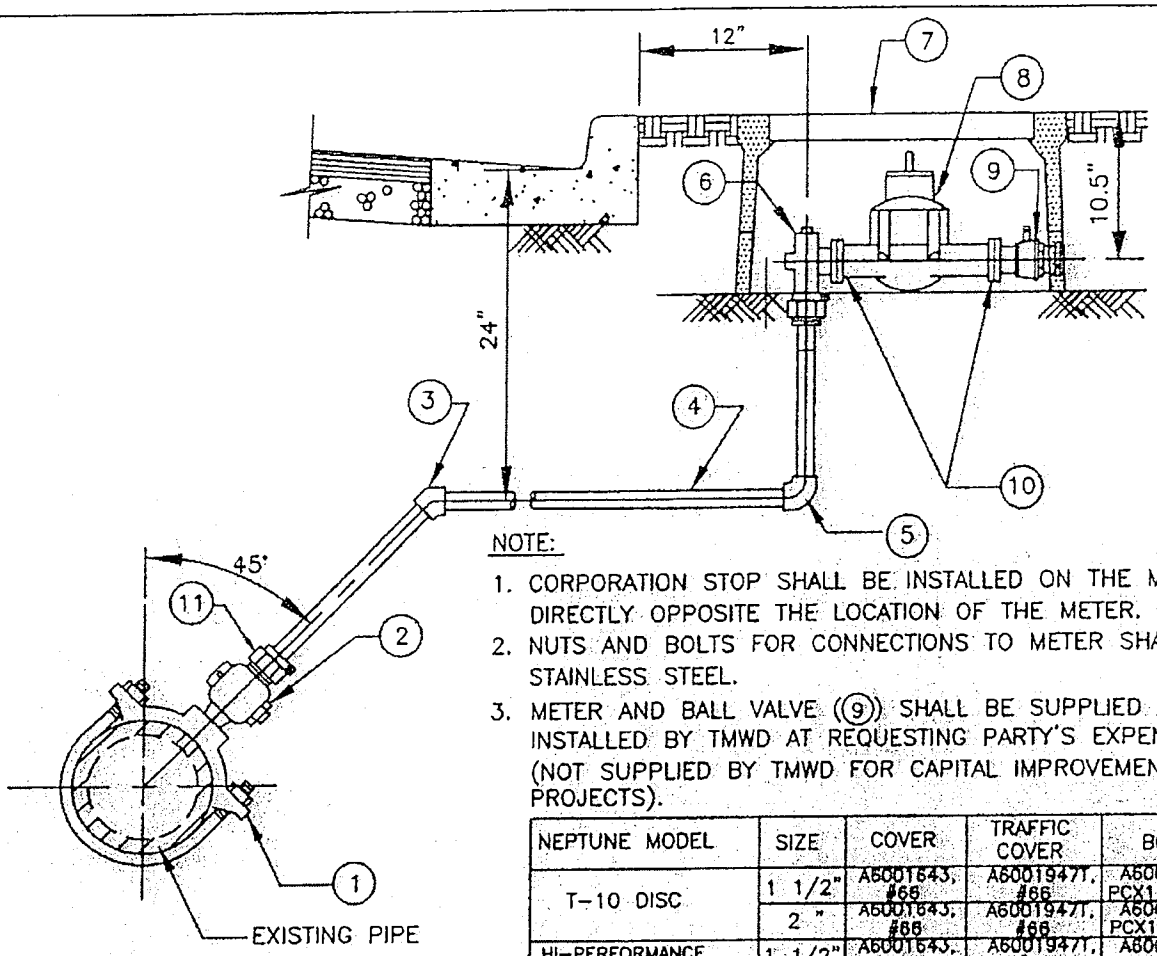

NOTE:

1. CORPORATION STOP SHALL BE INSTALLED ON THE MAIN DIRECTLY OPPOSITE THE LOCATION OF THE METER.
2. NUTS AND BOLTS FOR CONNECTIONS TO METER SHALL BE STAINLESS STEEL.
3. METER AND BALL VALVE (⑨) SHALL BE SUPPLIED AND INSTALLED BY TMWD AT REQUESTING PARTY'S EXPENSE. (NOT SUPPLIED BY TMWD FOR CAPITAL IMPROVEMENT PROJECTS).

NEPTUNE MODEL	SIZE	COVER	TRAFFIC COVER	BOX
T-10 DISC	1 1/2"	A6001643, #66	A6001947T, #66	A6001640 PCX12, #66
	2"	A6001643, #66	A6001947T, #66	A6001640 PCX12, #66
HI-PERFORMANCE TURBINE W/STRAINER (NOT SHOWN)	1 1/2"	A6001643, #66	A6001947T, #66	A6001640 PCX12, #66
	2"	A6001643, #66	A6001947T, #66	A6001640 PCX12, #66
TRU FLO COMPOUND W/ SEPARATE STRAINER (NOT SHOWN)	2"	A6001975, #67	A6001947T, #67	A6001974 PCX12, #66

ACCOMPANYING STD.'S T700, T701, T702 AND T116.

ITEM	DESCRIPTION	SIZE
①	SERVICE SADDLE-DOUBLE STRAP-BRONZE JONES 979, MCDONALD 3825, MUELLER BR2B, CAMBRIDGE BRASS (CB) #810- CC THREAD	MAIN SIZE X 2"
②	CORPORATION STOP-JONES E1930, FORD FB600-4NL, MUELLER B25000N CAMBRIDGE BRASS 301INL-M7B7, MCDONALD 74701B	2"
③	45° ELBOW-COPPER TO COPPER SJxSJ	2"
④	COPPER TUBING-TYPE "K" SOFT	2"
⑤	90° ELBOW-SJXSJ	2"
⑥	ANGLE METER STOP-JONES E1975W, FORD BFA43-777WNL, CB210NL-B7MF7	2"
⑦	METER BOX W/ COVER - ARMORCAST	SEE TABLE
⑧	NEPTUNE WATER METER, E-CODER)R900i WITH STUBBY ANTENNA CU. FT. REGISTER (TYPE TO BE DETERMINED BY TMWD)	SEE TABLE
⑨	BALL VALVE-JONES E1913W, FLGxFIP, CB# 212NL-F7MF7 -FORD BF13-777WNL OR 666WNL, W/HB67S HANDLE, FLGxFIP	1-1/2" OR 2"
⑩	NEOPRENE FULL FACE GASKET	1-1/2" OR 2"
⑪	PACK JOINT	

CITY OF TORRANCE

DATE ISSUED	TYPICAL 1-1/2" OR 2" METER (NON-TRAFFIC AREA) INSTALLATION WITH 2" SERVICE LINE	STANDARD NO.
JAN 2011	ROBERT J. BESTE PUBLIC WORKS DIRECTOR R.C.E. NO. 50737	T 704
		SHEET 1 OF 1

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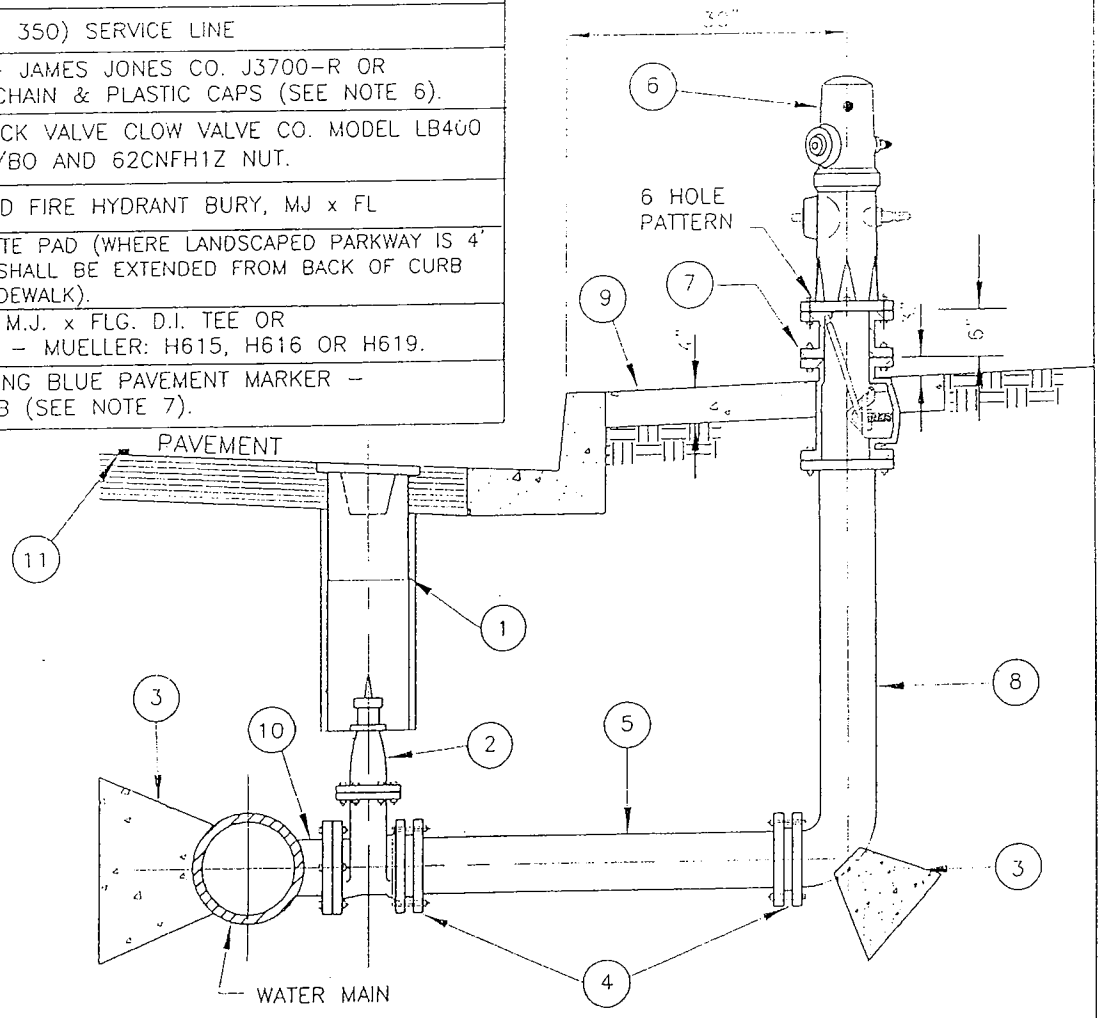
ITEM	MATERIALS
(1)	VALVE BOX ASSEMBLY PER T712.
(2)	6" VALVE MUELLER NO. A-2360-16 W/EVERDUR STEM & SS 316 FASTENERS W/2" NUT & NRS OPENING CCW.
(3)	CONCRETE THRUST BLOCK PER T713.
(4)	RESTRAINED JOINTS
(5)	6" D.I.P. (CLASS 350) SERVICE LINE
(6)	FIRE HYDRANT - JAMES JONES CO. J3700-R OR J3765-R WITH CHAIN & PLASTIC CAPS (SEE NOTE 6).
(7)	BREAK-OFF CHECK VALVE CLOW VALVE CO. MODEL LB400 62C35625RFT1Z/BO AND 62CNFH1Z NUT.
(8)	6" CEMENT LINED FIRE HYDRANT BURY, MJ x FL
(9)	4'x4'x4" CONCRETE PAD (WHERE LANDSCAPED PARKWAY IS 4' WIDE, PCC PAD SHALL BE EXTENDED FROM BACK OF CURB TO FRONT OF SIDEWALK).
(10)	MAIN SIZE x 6" M.J. x FLG. D.I. TEE OR TAPPING SLEEVE - MUELLER: H615, H616 OR H619.
(11)	2-WAY REFLECTING BLUE PAVEMENT MARKER - STIMSONITE 88AB (SEE NOTE 7).



NOTES:

1. SERVICE LINE SHALL BE INSTALLED LEVEL WITH MAINLINE UNLESS SHOWN OTHERWISE ON PLAN.
2. ALL PARTS OF THE FACILITY ABOVE GROUND SHALL BE THROUGHLY CLEANED BY WIRE BRUSHING AND PAINTED WITH 3 COATS OF RUSTOLEUM No. 7773 OR APPROVED EQUAL. COLOR OF HYDRANT SHALL BE PAINTED WITH 2 COATS OF SHERWIN WILLIAMS #B66Y00600 S YELLOW. TOTAL THICKNESS OF COATINGS SHALL BE A MINIMUM OF 6 MILS.
3. FIRE HYDRANT SHALL BE LOCATED 5 FEET MIN. FROM DRIVEWAYS END/BEGINNING OF CURB RETURN OR OTHER OBSTRUCTIONS. NO FIRE HYDRANT SHALL BE LOCATED IN THE CURB RADIUS.
4. USE J3765-R IN COMMERCIAL OR INDUSTRIAL AREAS AND ALONG MAJOR STREETS.
5. PLACE MARKER SIX INCHES FROM CENTER OF ROADWAY OR PAINTED CENTERLINE ON SIDE NEAREST THE HYDRANT.

ACCOMPANYING STD'S T700, T701, T712, T713, T723 AND T116.

CITY OF TORRANCE

DATE ISSUED	TYPICAL FIRE HYDRANT INSTALLATION FOR NON-LOCAL STREETS OR HIGH PRESSURE ZONE	STANDARD NO.
JAN 2011	ROBERT J. BESTE PUBLIC WORKS DIRECTOR R.C.E. NO. 50737	T 706 SHEET 1 OF 1

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DATE ISSUED
JAN 2011

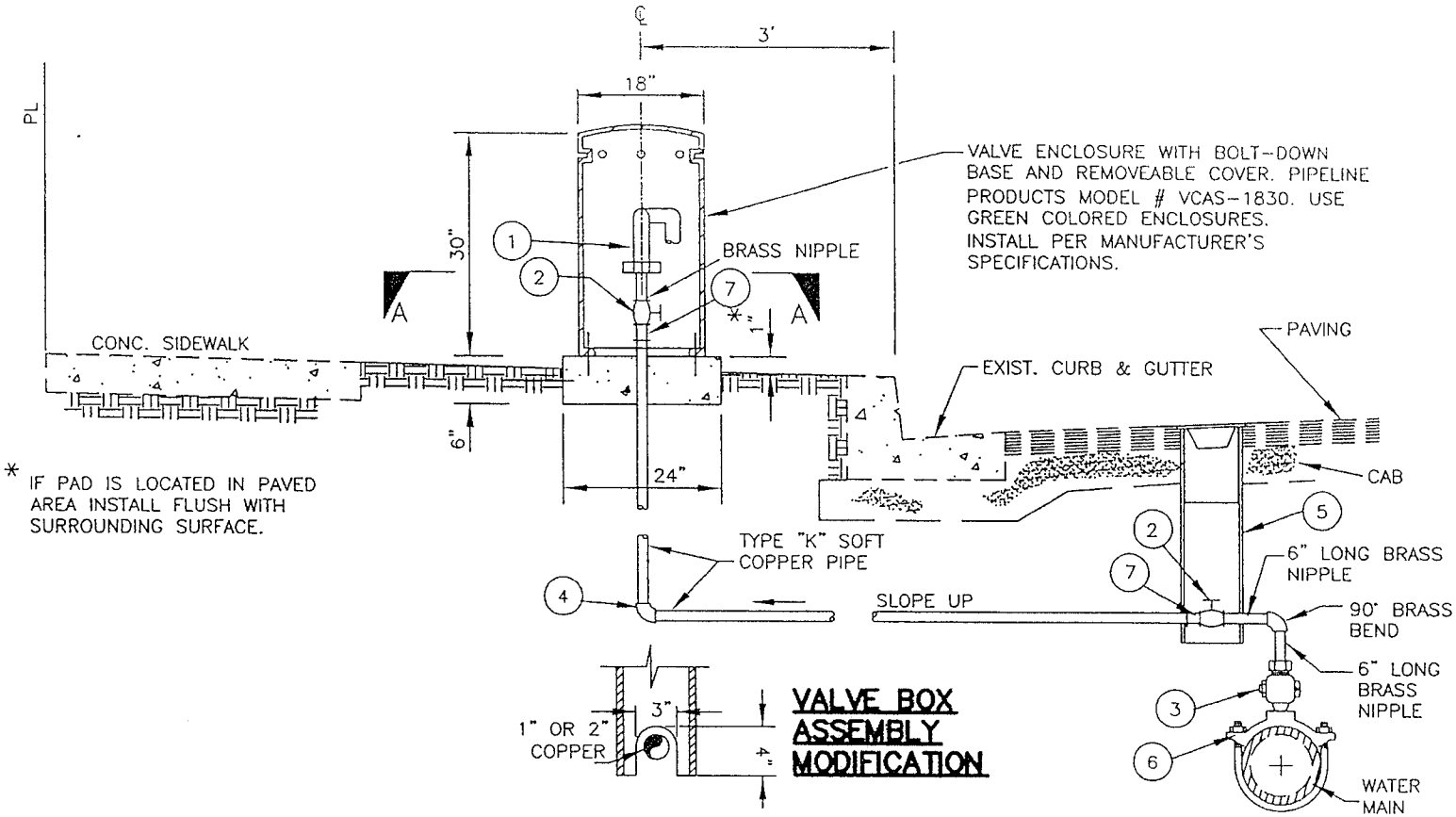
AIR AND VACUUM RELEASE VALVE

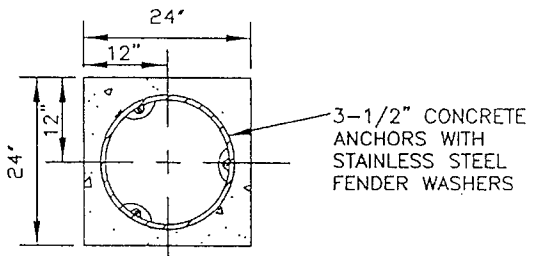
ROBERT J. BESTE
PUBLIC WORKS DIRECTOR
R.C.E. NO. 50737

CITY OF TORRANCE

ACCOMPANYING STD'S T700, T701, T702, T712 AND T116

STANDARD NO.
T 708
SHEET 1 OF 1

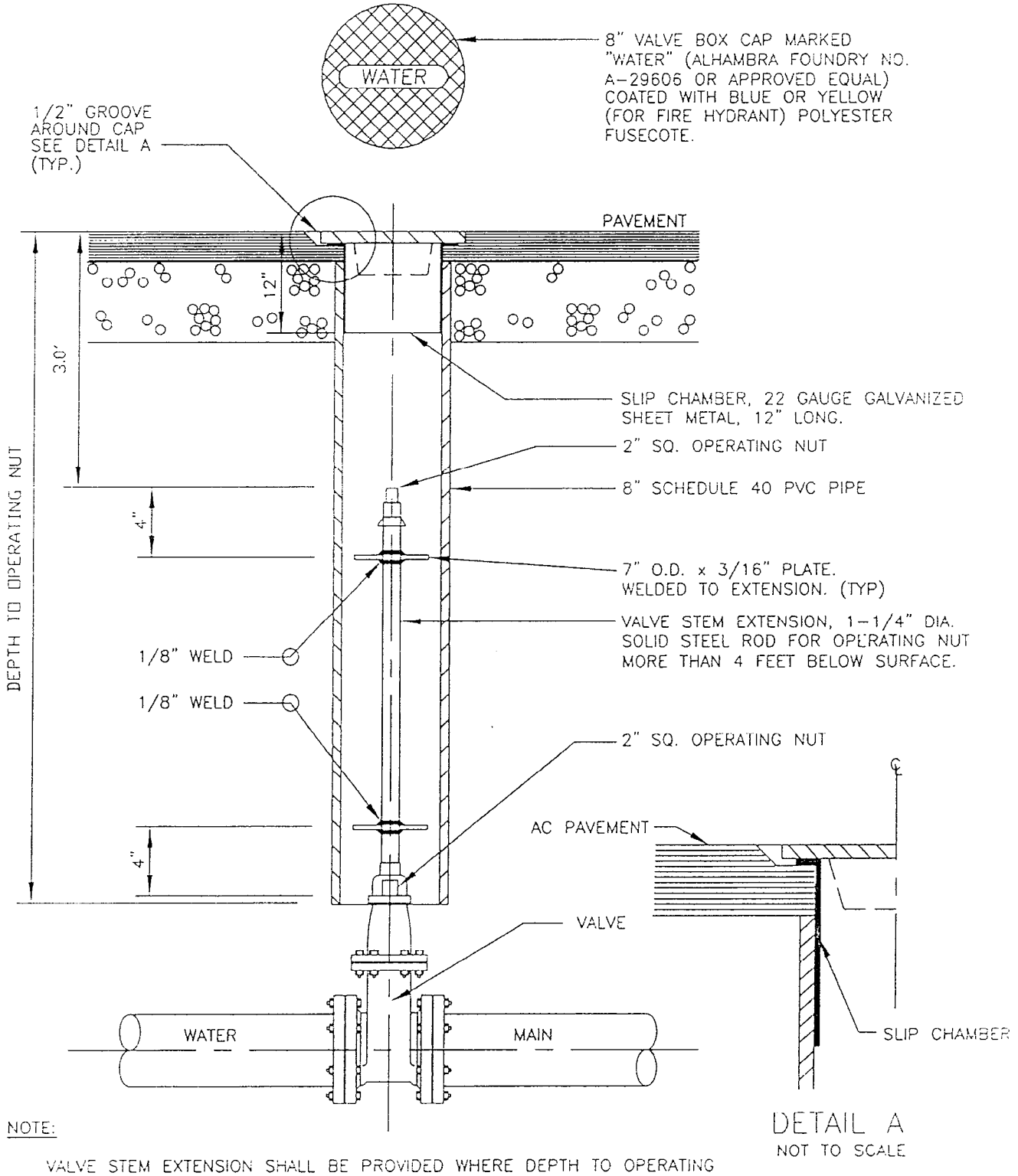




SECTION A-A

VALVE & PIPE OMITTED FOR CLARITY

COMBINATION AIR & VACUUM RELEASE VALVE **(FOR MAIN SIZE >= 16" USE 2", FOR MAIN SIZE < 16", USE 1")				
ITEM	PART NO.		**SIZE	DESCRIPTION
(1)	ARI D-040-P		1" OR 2"	COMBINATION AIR & VACUUM RELEASE VALVE
(2)	B11-444NL(FORD)	E-1900(JONES)	1"	BALL VALVE, FIPxFIP
	B11-777NL(FORD)	E-1900(JONES)	2"	
	CAMBRIDGE BRASS	#202NL-F4F4	1"	
	CAMBRIDGE BRASS	#202NL-F7F7	2"	
(3)	FB 1700-4NL(FORD)	E-1931(JONES)	1"	CORPORATION STOP, CCxFIP
	FB 1700-7NL(FORD)	E-1961(JONES)	2"	
	CAMBRIDGE BRASS	#30NL-M4F4	1"	
	CAMBRIDGE BRASS	#301NL-M7F7	2"	
(4)			1" OR 2"	90° COPPER ELBOW, SJXSJ
(5)				VALVE BOX ASSEMBLY (SEE T712) MOD.
(6)	J979(JONES)	CAMBRIDGE BRASS #B10	1" OR 2"	CC SERVICE SADDLE-DOUBLE STRAP
(7)			1" OR 2"	COPPER FITTING SJ x MIP



NOTE:

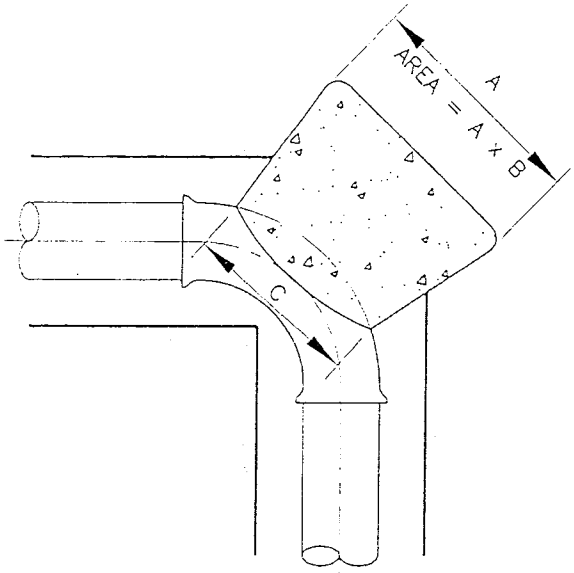
VALVE STEM EXTENSION SHALL BE PROVIDED WHERE DEPTH TO OPERATING NUT EXCEEDS 4'-0".

ACCOMPANYING STD. T700 AND T701

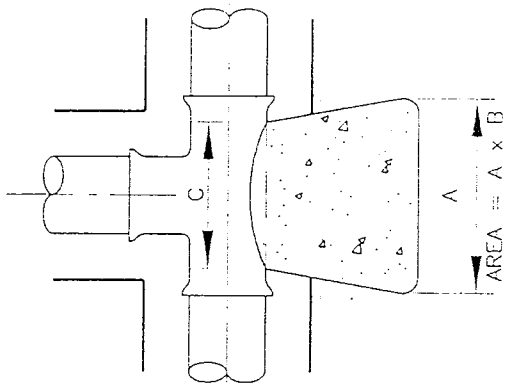
CITY OF TORRANCE

DATE ISSUED	VALVE BOX ASSEMBLY	STANDARD NO.
11 DEC 2006	ROBERT J. BESTE PUBLIC WORKS DIRECTOR R.C.E. NO. 50737	T712 SHEET 1 OF 1

EM/T712-3

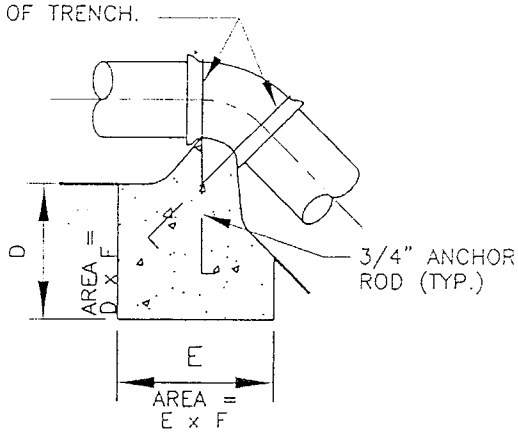


90 BEND

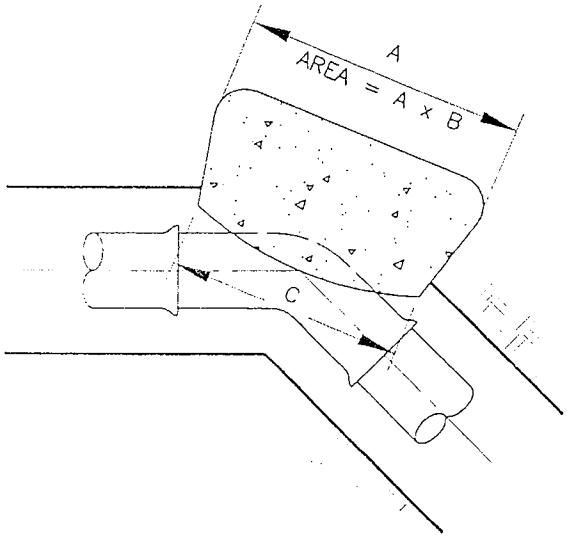


TEE

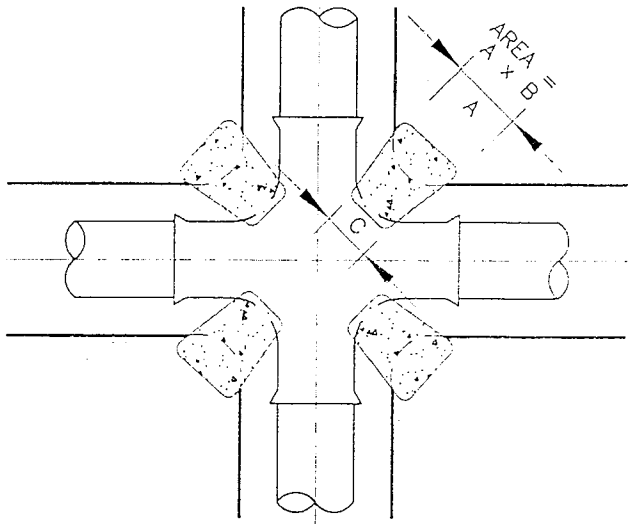
EXPOSED PORTION OF RE-BARS SHALL BE FIELD COATED W/TAR TO PREVENT CORROSION. MAKE BLOCK FULL WIDTH OF TRENCH.



VERTICAL BEND



BEND



CROSS

NOTE:

SEE SHEET 2 FOR THRUST BLOCK SCHEDULE AND NOTES.

CITY OF TORRANCE

DATE ISSUED	CONCRETE THRUST BLOCK	STANDARD NO.
JAN 2011	ROBERT J. BESTE PUBLIC WORKS DIRECTOR R.C.E. NO. 50737	T 713
		SHEET 1 OF 2

VERTICAL BENDS														
NOMINAL PIPE SIZE (INCHES)	TEST PRESSURE (PSI)	BENDS LESS THAN OR EQUAL TO ANGLE												ALL BENDS
		11-1/4°			22-1/2°			45°			90°			
		D	E	F	D	E	F	D	E	F	D	E	F	C
6"	200	1'-6"	3'-0"	1'-0"	2'-0"	4'-0"	1'-0"	3'-0"	5'-6"	1'-0"	4'-0"	7'-0"	2'-0"	8"
8"	200	2'-0"	4'-0"	1'-0"	2'-6"	5'-0"	1'-0"	3'-6"	7'-0"	2'-0"	5'-0"	10'-0"	3'-6"	10"
10"	200	2'-0"	4'-6"	1'-0"	3'-0"	6'-0"	1'-6"	4'-0"	9'-0"	3'-0"	6'-0"	12'-0"	5'-0"	1'-0"
12"	200	2'-6"	5'-0"	1'-0"	3'-6"	7'-0"	2'-0"	5'-0"	10'-0"	4'-0"	7'-0"	14'-0"	7"-0"	1'-0"

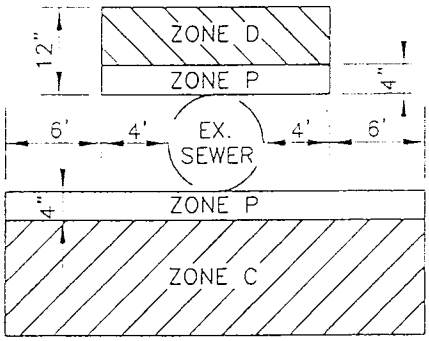
HORIZONTAL BENDS																
NOMINAL PIPE SIZE (INCHES)	TEST PRESSURE (PSI)	DEAD ENDS AND TEES			CROSS			BENDS LESS THAN OR EQUAL TO ANGLE								ALL BENDS
								11-1/4°		22-1/2°		45°		90°		
		A	B	C	A	B	C	A	B	A	B	A	B	A	B	C
6"	200	2'-6"	1'-6"	6"	2'-0"	1'-0"	6"	1'-0"	1'-0"	2'-0"	1'-0"	3'-0"	1'-0"	3'-6"	1'-6"	8"
8"	200	4'-6"	1'-6"	8"	2'-0"	1'-6"	8"	1'-6"	1'-0"	3'-0"	1'-0"	3'-6"	1'-6"	5'-0"	2'-0"	10"
10"	200	5'-6"	2'-0"	10"	2'-6"	2'-0"	10"	2'-0"	1'-0"	3'-0"	1'-6"	4'-0"	2'-0"	6'-0"	2'-6"	1'-0"
12"	200	7'-6"	2'-0"	1'-0"	3'-6"	2'-0"	1'-0"	2'-0"	1'-6"	3'-0"	2'-0"	4'-6"	2'-6"	7'-0"	3'-0"	1'-0"

NOTES:

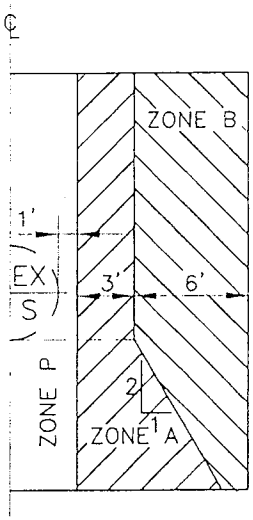
1. THRUST BLOCK SIZES ARE BASED ON A BEARING CAPACITY OF 1500 P.S.F., WITH A MINIMUM SOIL COVER OF 3'-0". IF SOIL COVER IS LESS THAN 3'-0", MULTIPLY BEARING AREA BY FACTOR OF 1.5 FOR SOIL COVER OF 2'-0" TO 3'-0", OR 3.0 FOR SOIL COVER OF 1'-0" TO 2'-0".
2. DIMENSIONS SHOWN REFER TO THRUST BLOCK TYPES SHOWN IN DETAIL, AND ARE MINIMUM VALUES ONLY.
3. CONCRETE MIX SHALL BE IN ACCORDANCE WITH SPECIFICATIONS FOR 3000 LBS. STRENGTH AT 28 DAYS WHEN TESTED IN ACCORDANCE WITH ASTM C39.
4. ALL THRUST BLOCKS SHALL BE POURED SOLIDLY AGAINST FIRM, UNDISTURBED SOIL.
5. IF SOILS HAVE BEEN PREVIOUSLY EXCAVATED AND BACKFILLED, CONTRACTOR SHALL NOTIFY THE ENGINEERING DIRECTOR, WHO MAY DIRECT THAT THE DIMENSIONS SHOWN SHALL BE INCREASED BY A FACTOR OF 1.5.
6. CONCRETE POURED AGAINST PIPE FITTINGS SHALL NOT EXTEND BEYOND THE FITTING JOINTS WITHOUT THE APPROVAL OF THE ENGINEERING DIRECTOR.
7. WHERE WATER MAIN DEAD ENDS AND IS BLIND FLANGED OR CAPPED, THE THRUST BLOCK SHALL EXTEND A MINIMUM DISTANCE OF 6" INTO THE SIDE OF TRENCH ON EITHER SIDE OF PIPE.

CITY OF TORRANCE

DATE ISSUED	THRUST BLOCK SCHEDULE	STANDARD NO.
JAN 2011	ROBERT J. BESTE PUBLIC WORKS DIRECTOR R.C.E. NO. 50737	T 713
		SHEET 2 OF 2



PERPENDICULAR CONSTRUCTION



PARALLEL CONSTRUCTION

CITY OF TORRANCE

DATE ISSUED	WATER AND SEWER SEPARATION REQUIREMENTS	STANDARD NO.
JAN 2011	ROBERT J. BESTE PUBLIC WORKS DIRECTOR R.C.E. NO. 50737	T 714
		SHEET 1 OF 2

BASIC SEPARATION STANDARDS

1. PARALLEL CONSTRUCTION: THE HORIZONTAL DISTANCE BETWEEN PRESSURE DOMESTIC WATER AND RECLAIMED WATER MAINS AND SEWER LINES SHALL BE AT LEAST 10 FEET.

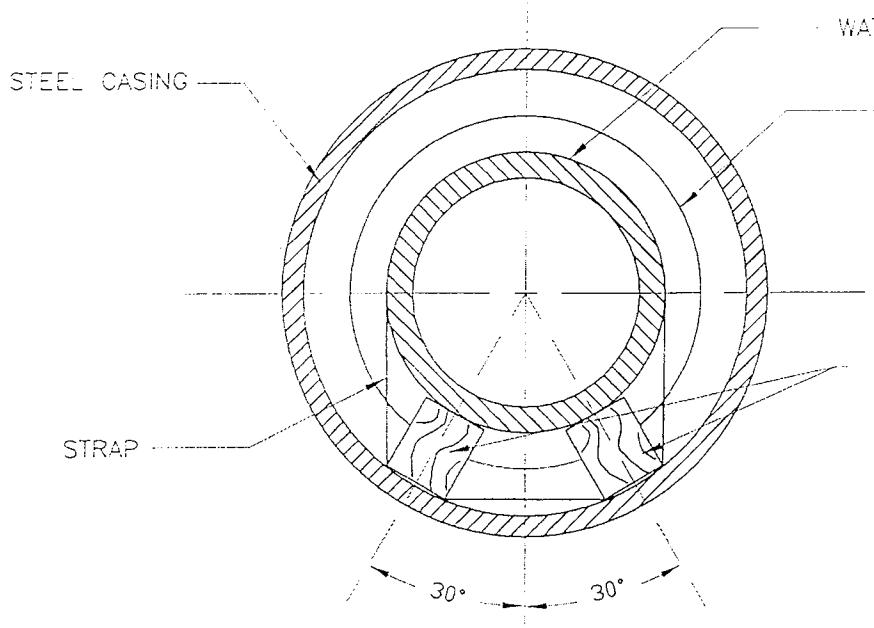
2. PERPENDICULAR CONSTRUCTION (CROSSING): PRESSURE WATER MAINS SHALL BE AT LEAST ONE FOOT ABOVE SANITARY SEWER AND RECLAIMED WATER LINES WHERE THESE LINES MUST CROSS.

3. SPECIAL PROVISIONS: ALTERNATE CONSTRUCTION CRITERIA WHERE THE BASIC SEPARATION STANDARDS CANNOT BE ATTAINED ARE SHOWN BELOW:

ZONE	WATER CONSTRUCTION (EXISTING SEWER)
B	1) CLASS 350 D.I.P. WATER MAIN. 2) APPROVED ALTERNATES.
C/D	1) CLASS 350 D.I.P. WATER MAIN W/NO JOINT 2) STEEL CASING PER STD. T715 3) APPROVED ALTERNATES.
A	NO CONSTRUCTION WITHOUT APPROVAL OF WATER DIVISION AND DEPARTMENT OF PUBLIC HEALTH.
P	CONSTRUCTION WITHIN THIS AREA PROHIBITED.

CITY OF TORRANCE

DATE ISSUED	WATER AND SEWER SEPARATION REQUIREMENTS	STANDARD NO.
JAN 2011	ROBERT J. BESTE PUBLIC WORKS DIRECTOR R.C.E. NO. 50737	T 714
		SHEET 2 OF 2



UNFINISHED REDWOOD SKIDS 3' LONG BEVELED BOTH ENDS. FOUR SKIDS PER LENGTH OF PIPE TO BE STRAPPED IN PLACED 3' FROM EACH END OF PIPE. NOTCH SKID TO SEAT STRAP. TWO STRAPS PER SET OF SKIDS.

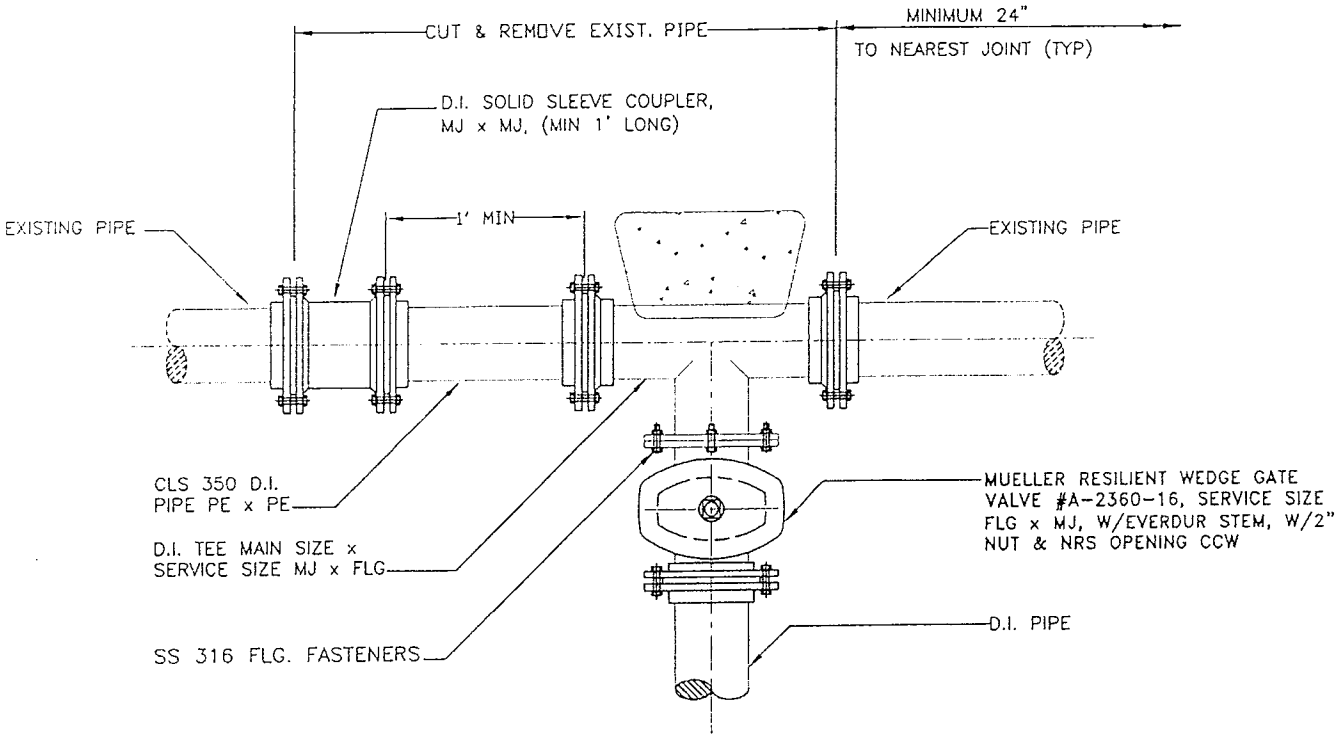
SCHEDULE STEEL CASING WITH EPOXY COATING FOR WATER PIPE				
ORIGINAL PIPE SIZE	MAXIMUM CASING SIZE	MIN. WALL	SKIDS	
4"	10" I.D.	1/4"	2"X4"	UNFINISHED REDWOOD
6"	12" I.D.	1/4"		
8"	16" I.D.	1/4"		
10"	18" I.D.	5/16"	3"X4"	
12"	20" I.D.	5/16"		

NOTES:

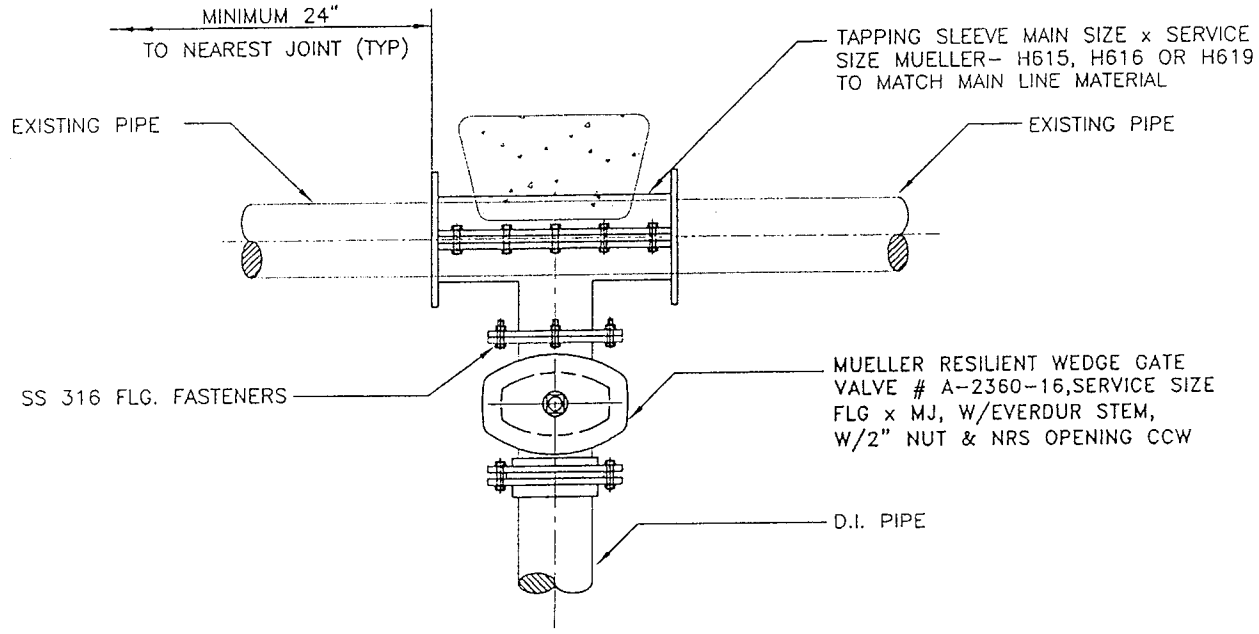
1. CASING SHALL BE INSTALLED BY THE TRENCH, BORE, JACK AND/OR TUNNEL METHOD. IF CASING INSTALLED BY TRENCH METHOD IT SHALL BE INSTALLED PER STD. T701.
2. REDWOOD SKIDS SHALL BE PROVIDED AS PER DETAIL ABOVE.
3. SIZE AND THICKNESS OF CASING SHALL BE AS SHOWN IN SCHEDULE ABOVE.
4. ALL CASING SECTIONS TO BE JOINED BY FULL CIRCUMFERENTIAL WELD.
5. CASING TO BE FILLED TO TOP OF BELL OF WATER PIPE WITH AIR BLOWN SAND OR SLURRY MIX.
6. ENDS OF CASING SHALL BE SEALED WITH CEMENT SLURRY MIX 100-E-100.
7. STRAPS TO BE STAINLESS STEEL.

CITY OF TORRANCE

DATE ISSUED	STEEL CASING PIPE	STANDARD NO.
JAN 2011	ROBERT J. BESTE PUBLIC WORKS DIRECTOR R.C.E. NO. 50737	T 715
		SHEET 1 OF 1



CUT IN METHOD



HOT TAP METHOD

ACCOMPANYING STD. T700, T701, T712, AND T713

CITY OF TORRANCE

DATE ISSUED	D.I. CONNECTION TO MAIN	STANDARD NO.
JAN 2011	ROBERT J. BESTE PUBLIC WORKS DIRECTOR R.C.E. NO. 50737	T 723 SHEET 1 OF 1

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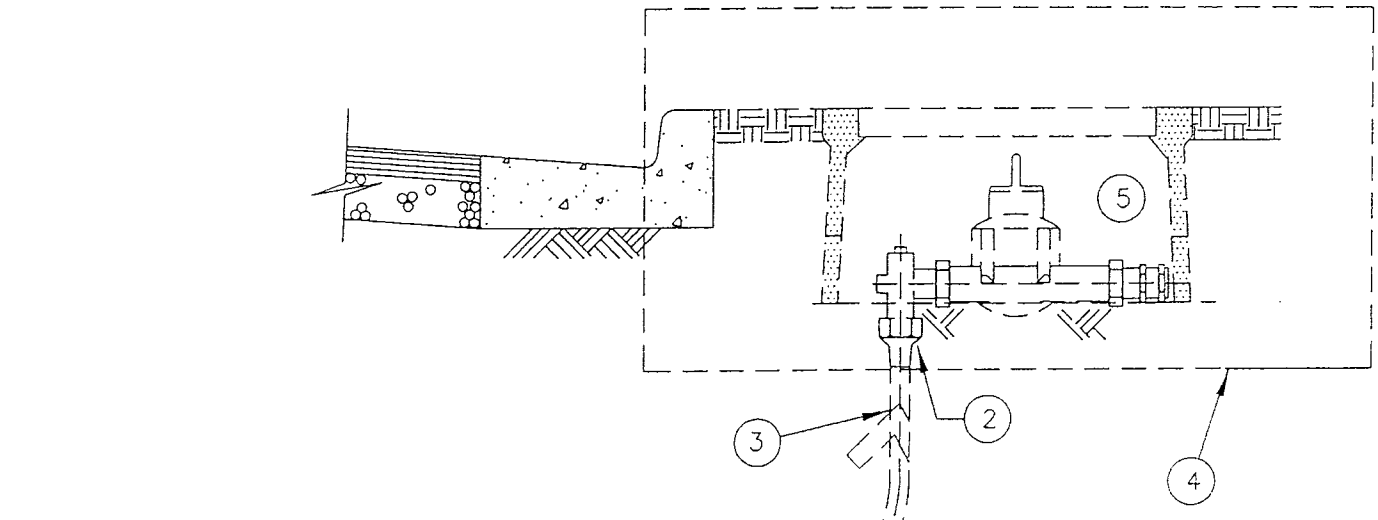
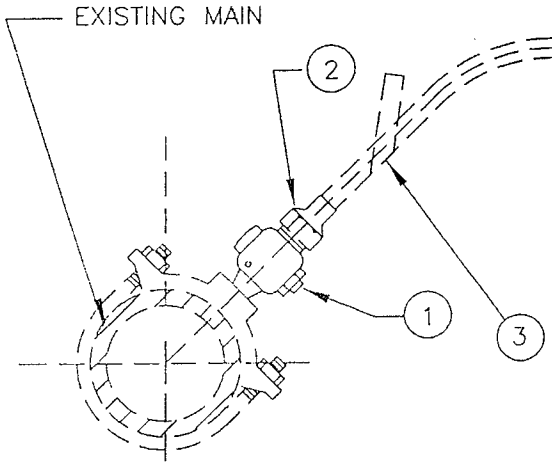
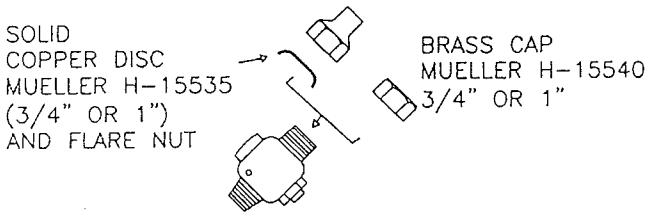




NOTE:
IF EXISTING MAIN IS BEING ABANDONED, FITTINGS AT THE MAIN NEED NOT BE REMOVED.

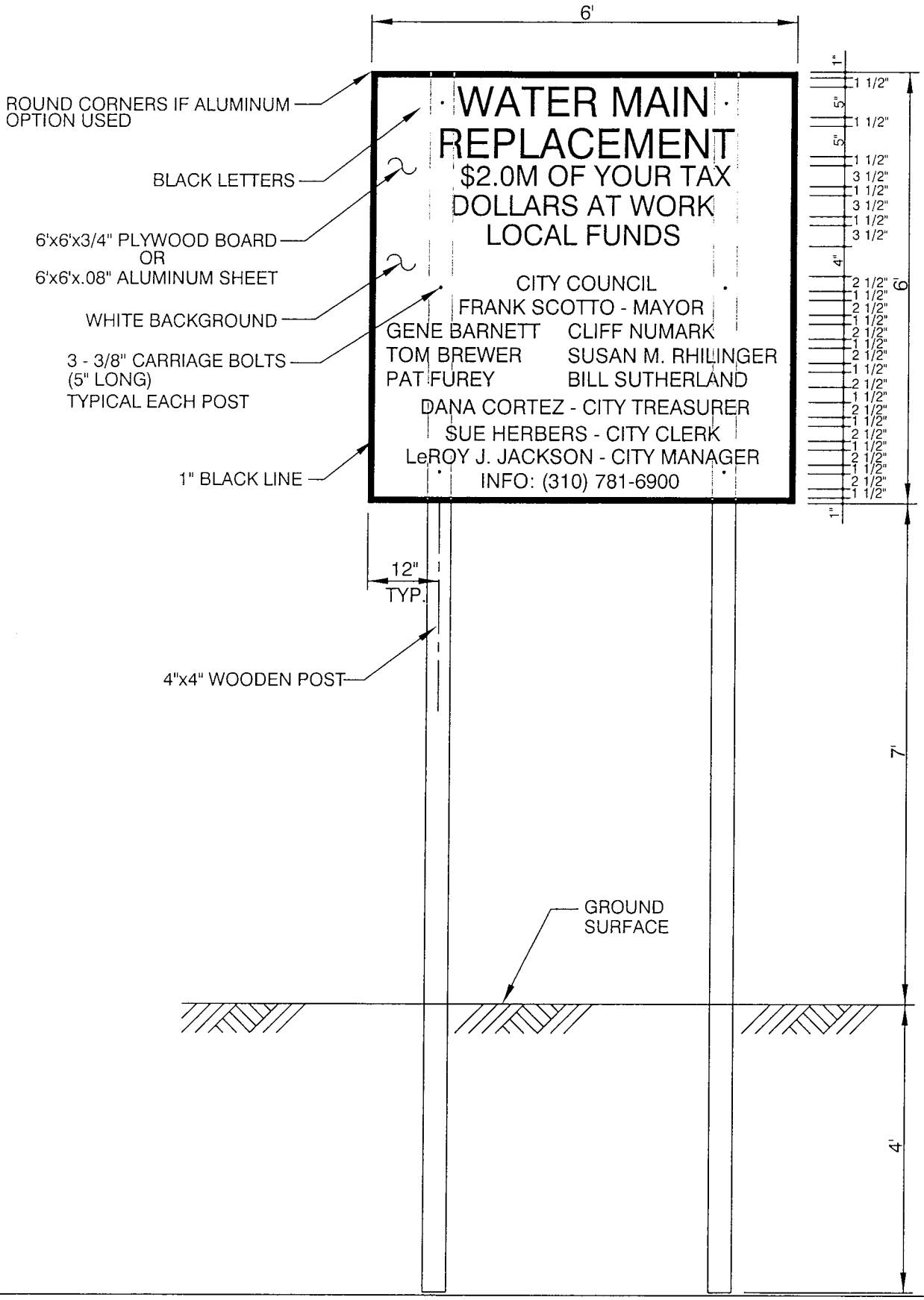


CORPORATION STOP

ITEM	DESCRIPTION
(1)	SHUT OFF CORP. STOP
(2)	REMOVE FLARE NUT. INSTALL BRASS CAP OR COPPER DISC W/FLARE NUT ON CORPORATION STOP.
(3)	CRIMP COPPER PIPE 12" FROM ANGLE VALVE AND CORP. STOP
(4)	REMOVE EXISTING METER, METER BOX AND ANGLE VALVE RETURN METER AND ANGLE VALVE TO CITY OF TORRANCE.
(5)	VOID FROM WATER METER ASSEMBLY REMOVAL SHALL BE BACKFILLED, WITH NATIVE SOIL OR SUITABLE MATERIAL AS APPROVED BY THE ENGINEER, TO GRADE.

CITY OF TORRANCE

DATE ISSUED	SERVICE ABANDONMENT TYPICAL 3/4" OR 1" METER	STANDARD NO.
JAN 2011	ROBERT J. BESTE PUBLIC WORKS DIRECTOR R.C.E. NO. 50737	T 725
		SHEET 1 OF 1



CITY OF TORRANCE

DATE ISSUED	CONSTRUCTION IMPROVEMENT SIGN	STANDARD NO.
	ROBERT J. BESTE PUBLIC WORKS DIRECTOR R.C.E. NO. 50737	T503-0 SHEET 1 OF 1

I:\Bennooz1\Torrance Blvd Rehab Sign

APPENDIX III

CONSTRUCTION AND DEMOLITION DEBRIS RECYCLING SUMMARY

CONSTRUCTION AND DEMOLITION DEBRIS RECYCLING SUMMARY

Project Type: ☐ Roadway and/or Bridge/Structure ☐ Water/Sewer
☐ Traffic Signal/Street Lighting ☐ Other _____

Project Name: _____ Date: _____

City Contract No._____

Project Location: _____

Thomas Guide Page/Grid No(s): _____

Contractor Name: _____

Contractor Address: _____

Contractor License #: _____

Project Duration: From: _____ To: _____

Demolition and Recycling Cost: $_____

Type(s) of Debris Generated	Total Quantity Generated (tons, c.y. or units)	Reuse /Recycling		Disposal	
		Total Quantity (tons, c.y. or units)	Name of Reuse/Recycling Facility/Site	Total Quantity (tons, c.y. or units)	Name of Disposal Facility
Asphalt					
Brick					
Concrete					
Green Waste					
Metal (ferrous)					
Metal (non-ferrous)					
Mixed Debris					
Rock					
Soil					
Wood Waste					
Other:					
Total					

Notes:

- Other debris types may include, but are not limited to, Ash, Cardboard, Carpeting, Glass, Gravel, Land Clearing Debris, Non-friable Asbestos, Paper, Plastic, Porcelain, Roofing Material, Sand, and Tires. Attach additional sheets if necessary.
- If the debris is taken to a transfer station solely for the purpose of reuse/recycling, then list the transfer station as the reuse/recycling facility/site.
- If the debris is taken to a transfer station solely for the purpose of transfer to a disposal facility, then list the transfer station as the disposal facility.

Prepared by _____ Signature _____

Phone #:_____