

**SUBMITTAL TO THE BOARD OF DIRECTORS OF THE
REDEVELOPMENT AGENCY
COUNTY OF RIVERSIDE, STATE OF CALIFORNIA**

444



FROM: Redevelopment Agency

SUBMITTAL DATE:
July 15, 2010

SUBJECT: Notice of Completion – French Valley Airport Parking Lot Construction Project

RECOMMENDED MOTION: That the Board of Directors execute and file the attached Notice of Completion for the French Valley Airport Parking Lot Construction Project.

BACKGROUND: The purpose of the Project was to construct a new 44,000 square-foot parking lot area comprised of up to 90 parking spaces to include drought tolerant landscaping and parking lot signage and lighting. The development has significantly enhanced the available parking area and afforded greater access to the Airport terminal. All Project related work has been accomplished in conformance with the applicable Federal Aviation Administration (FAA) Guidelines and the Airport has been returned to its full operational capacity.

Robert Field

Robert Field
Executive Director
By Dan Martinez, Deputy Executive Director

FINANCIAL DATA	Current F.Y. Total Cost:	\$ 0	In Current Year Budget:	Yes
	Current F.Y. Net County Cost:	\$ 0	Budget Adjustment:	No
	Annual Net County Cost:	\$ 0	For Fiscal Year:	2010/11

COMPANION ITEM ON BOARD OF SUPERVISORS AGENDA: No

SOURCE OF FUNDS: DCPA Redevelopment Capital Improvement Funds	Positions To Be Deleted Per A-30	<input type="checkbox"/>
	Requires 4/5 Vote	<input type="checkbox"/>

C.E.O. RECOMMENDATION:

APPROVE

BY: *Jennifer L. Sargery*
Jennifer L. Sargery

County Executive Office Signature

MINUTES OF THE BOARD OF DIRECTORS OF THE REDEVELOPMENT AGENCY

On motion of Supervisor Stone, seconded by Supervisor Ashley and duly carried by unanimous vote, IT WAS ORDERED that the above matter is approved as recommended.

Ayes: Buster, Tavaglione, Stone, Benoit and Ashley
Nays: None
Absent: None
Date: July 13, 2010
xc: RDA, Recorder

Kecia Harper-Ihem
Clerk of the Board
By: *Kecia Harper-Ihem*
Deputy

Prev. Agn. Ref.: 10/14/09 4.1

District: 3

Agenda Number:

FORM APPROVED COUNTY COUNSEL
BY: *Neal R. Kipnis*
NEAL R. KIPNIS
DATE: *July 23, 2010*
Departmental Concurrence

Dept Recomm.: Consent Policy
Per Exec. Ofc.: Consent Policy

To be recorded with County Recorder within 10 days after completion. No recording fee.

DOC # 2010-0346760

07/26/2010 08:00A Fee:NC

Page 1 of 3

Recorded in Official Records

County of Riverside

Larry W. Ward

Assessor, County Clerk & Recorder



When recorded, return to:

Clerk, Board of Supervisors
County Administrative Center
4080 Lemon Street, 5th Floor
Riverside, CA 92501

NOTICE OF COMPLETION
(Civil Code § 3093 - Public Works)

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NOTICE OF COMPLETION

Notice is hereby given by the undersigned owner, a public entity of the State of California, that a public work of improvement has been completed, as follows:

C
512

Project title or description of work: French Valley Airport Parking Lot Construction Project by the Riverside County Redevelopment Agency.

Date of completion: Date hereof 07/13/10

Nature of owner: Government, County of Riverside

Interest or estate of owner: In fee

Address of owner: Clerk, Board of Supervisors, County Administrative Center
4080 Lemon Street, 5th Floor, Riverside, CA 92501

Name of Contractor: Vance Corporation

Street address or legal description of site: 37552 Winchester rd, Murrieta, CA 92563

Dated: July 13, 2010

Owner: County of Riverside
(Name of Public Entity)

By: Marion Ashley
Marion Ashley, Chairman

FORM APPROVED COUNTY COUNSEL
BY: Neal R. Kipnis DATE: 7/13/10

STATE OF CALIFORNIA)
COUNTY OF RIVERSIDE) SS

I am the Chairman of the governing board of the County of Riverside, the public entity which executed the foregoing notice and on whose behalf I make this verification; I have read said notice, know its contents, and the same is true. I certify under penalty of perjury that the foregoing is true and correct.

Executed at Riverside, California on July 13, 2010 (Date)

By: Marion Ashley Marion Ashley, Chairman, Board of Supervisors

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ATTEST:
KECIA HARPER-IHEM, Clerk of the Board

by: Kathleen J. Gatten
Deputy

07.13.10 4.3 2010-08-10 2254

LARRY W. WARD
COUNTY OF RIVERSIDE
ASSESSOR-COUNTY CLERK-RECORDER

Recorder
P.O. Box 751
(951) 486-7000

www.riversideacr.com

CERTIFICATION

Pursuant to the provisions of Government Code 27361.7, I certify under the penalty of perjury that the following is a true copy of illegible wording found in the attached document:

(Print or type the page number(s) and wording below):

CLARIFICATION FOR AREA OBSCURED BY SEAL:

FORM APPROVED COUNTY COUNSEL

BY: _____
NEAL R. KIPNIS DATE

Date:

07-13-10

Signature:



Print Name: Karen Barton, Board Assistant





LARRY W. WARD
COUNTY OF RIVERSIDE
ASSESSOR-COUNTY CLERK-RECORDER

Recorder
P.O. Box 751
Riverside, CA 92502-0751
(951) 486-7000

<http://riverside.asrelkrec.com>

CERTIFICATION

Pursuant to the provisions of Government Code 27361.7, I certify under the penalty of perjury that the following is a true copy of illegible wording found in the attached document:

(Print or type the page number(s) and wording below):

CLARIFICATION OF THE SEAL for the Riverside County Board of Supervisors
(embossed on document)



Date: 7-13-10

Signature: *Karen Barton*

Print Name: Karen Barton, Board Assistant, Riverside County Clerk of the Board



of the Work. Said material lists shall be submitted at or prior to project preconstruction meeting and said lists shall be approved by the Owner prior to beginning construction.

11. Construction

Contractor alone shall be responsible for the safety, efficiency, and adequacy of his plant, equipment, appliances, and methods and for any damage which may result from their failure or their improper construction, maintenance, or operation.

Contractor shall be responsible for examining all Construction Drawings, Specifications, Standard Drawings, Work site, delivery routes, and local conditions which may affect the Work.

Before proceeding with the Work, Contractor shall furnish the Owner any information required of him by the Construction Drawings, Specifications, Standard Drawings, Special Requirements, and Directions of the Owner.

Contractor shall keep at jobsite a complete set of Construction Drawings, Specifications, Standard Drawings, permits, certificates and licenses for the Work, and all other data required by the Owner. Contractor shall be responsible for checking all dimensions and quantities on said drawings or schedules and shall notify the Owner of any errors and omissions found.

Until acceptance of the Work by the Owner, Contractor shall bear the risk of injury or damage to any part of the Work by action of the elements or from any other cause and Contractor shall rebuild, repair, restore, and make good any injuries or damages to the Work except as limited in the Contract Appendix.

Contractor shall cooperate with other contractors who are working in the project area as the Owner may specify and he shall comply with all orders of the Owner. Contractor shall employ only competent and skillful persons to perform the Work. Said persons shall be qualified or certified to perform the Work in accordance with requirements of said person's trade.

Contractor shall submit to the Owner for approval a construction schedule covering all Work based on normal work periods. Contractor shall not deviate from approved schedule without prior permission from the Owner. Whenever Contractor arranges to work at night or at any time other than normal work periods or to vary the period during which Work is to be carried on each day, he shall obtain special permission from the Owner to do so and he shall keep the Owner properly informed of his activities. Construction schedule shall show the order in which Contractor proposes to carry out Work, dates of anticipated commencement and completion of Work and salient components thereof, and estimated percentage of Work to be completed at any time during the construction period.

12. Records of Construction

Contractor shall maintain at least one complete set of Construction Drawings on the jobsite during the course of construction upon which he shall note any changes in the Work as they occur. Contractor shall maintain said Drawings so that the Owner may at any time during the course of construction ascertain the changes that have occurred. Said Construction Drawings shall be the basis of the two sets of record drawings that Contractor shall provide the Owner upon completion of the Work.

13. Inspection

All materials and equipment furnished and all Work performed shall be subject to rigid inspection by the Owner. Contractor may be required to remove and replace under proper inspection any Work performed in the absence of prescribed inspection, with the entire cost being borne by Contractor irrespective of whether such Work is found to be defective. Work covered up without authority of the Owner shall, upon order of the Owner, be uncovered to the extent required to permit inspection, repair, or replacement and thereafter be recovered, and Contractor shall bear entire cost.

14. Examination of Work

Contractor shall furnish the Owner every reasonable facility for ascertaining whether Work is being accomplished in accordance with the requirements and intention of the Construction Drawings, Specifications, Standard Drawings, Special Requirements, and Directions of the Owner.

15. Right to Occupy Work

The Owner may wish to occupy or place in service portions of the Work before its final completion and shall be at liberty to do so. Such occupancy or placing in service of any portion of the Work shall not relieve Contractor of his responsibility of protection and care of all Work until final completion and acceptance provided, however, that expense directly attributable to operation and placing portions of Work in service shall not be chargeable to Contractor.

16. Maintenance and Guarantee

Contractor shall guarantee that all Work performed by him meets all requirements specified as to character, quality, and quantity of materials and workmanship. Contractor shall replace all materials and pay all installation costs made necessary by defects in materials or workmanship supplied by him that become evident within one year after acceptance of the facilities or the date of final payment, whichever occurs later.

Contractor shall replace all defective materials promptly upon receipt of written notice from the Owner. If Contractor fails to replace all defective materials promptly, the Owner may secure the service of others to perform the Work and Contractor shall be liable to the Owner for any costs including removal and replacement thereof.

17. Construction Power

Contractor shall provide all necessary power required for his operations, and shall provide and maintain in good order such modern power equipment and installation as shall be adequate, in the opinion of the Owner, to perform the required Work in a safe and satisfactory manner.

18. Construction Water

Unless specified otherwise, the Owner will provide construction water to Contractor from its existing system at established rates. Contractor shall furnish and install all necessary piping and appurtenances necessary to convey water from the Owner's metered service connection to place of use.

19. Welding

Welding shall be done by the electric arc method using a process which excludes the atmosphere from the molten metal, except where otherwise approved by the Owner. Welding electrodes used for manual welding shall be an approved type. Except as modified herein, welding process qualification and operator qualification shall comply with the applicable requirements of the "Code for Arc and Gas Welding in Building Construction" of the AWS.

Each weld shall be uniform in width and size throughout its entire length. Each layer shall be smooth, free from slag, cracks, pinholes, and undercut and shall be completely fused to adjacent weld beads and base metal. Cover pass shall be completely free of coarse ripples, irregular surfaces, non-uniform bead pattern, high crown, deep ridges, or valleys between beads, and shall blend smoothly and gradually into surface of base metal. Butt welds shall be slightly convex, of uniform height, and shall have full penetration. Fillet welds shall be of size indicated, with full throat, and with each leg of equal length. Repair, chipping, or grinding of welds shall not gouge, groove, or reduce base metal thickness.

20. Environmental Factors

Contractor shall take all reasonable precautions to protect the environment.

a. Air Pollution

Contractor shall use only machinery and equipment which is equipped with suitable air pollution control devices so that undue quantities of pollutants are not added to the atmosphere in the vicinity of the Work site. Contractor's equipment shall meet all Federal, State, and local requirements for air quality emissions and Contractor shall comply with all applicable Federal, State, and local air pollution control regulations.

Contractor shall also take all necessary precautions to control dust created by construction operations. Contractor shall be especially diligent in implementing his dust control program and he shall be prepared to respond immediately and positively to any instructions for corrective action given by the Owner. Contractor shall use dust palliatives if necessary to satisfactorily control dust; however, Contractor shall secure the Owner's approval for use of dust palliatives other than water.

b. Explosives

Contractor shall handle, transport, store, and use explosives in accordance with applicable Federal, State, and local laws and regulations. Contractor shall be responsible for and make good any damage caused by his use of explosives.

c. Fires

Contractor shall exercise all precautions necessary to prevent unauthorized fires within or adjacent to the limits of the Work. Contractor shall be responsible for all damage resulting from fire due directly or indirectly to his or his employees' activities or the activities of his subcontractors or their employees.

d. Drainage and Flooding

Contractor shall manage excavation and spoil banks such that existing drainage conditions are not impaired. Contractor shall provide drainage in all cases where the existing drainage conditions are being unavoidably altered or disturbed by his operations. Temporary diversions, ditches, checks, swales, or other drainage structures or features necessary to ensure proper drainage and flood control shall be provided by Contractor at no extra cost to the Owner.

e. Historical and Archaeological Sites

If Contractor should encounter any evidence of historical or archaeological significance, he shall immediately cease construction, notify the Owner, and refrain from any activity until the Owner orders Work to resume. The Owner will assume full responsibility for any delays caused by historical or archaeological investigations.

f. Noise Pollution

Contractor shall equip all machinery and equipment used for construction with noise control devices such as mufflers for internal combustion engines or other suitable noise suppressors. Noise produced by construction operations shall be kept to a minimum and shall be consistent with reasonable human health requirements considering time of day and location of Work site. Contractor shall comply with all applicable Federal, State, and local noise pollution control regulations.

Unless specified otherwise, noise levels in connection with the Work shall not exceed 75 dB(A) at a distance of one hundred (100) feet for relatively continuous exposure and they shall not exceed 90 dB(A) at that same distance for relatively infrequent intermittent exposure. Contractor shall be prepared to respond immediately and positively to any instructions for corrective action given by the Owner particularly with respect to complaints from the public.

g. Public Relations

Contractor shall give due consideration to the comfort and convenience of the public and he shall instruct his employees to be polite and respectful in their dealings with the public at the Work site and in traveling to and from the Work site.

h. Traffic

Contractor shall adequately protect the public using any roads which are involved in Contractor's operations and he shall maintain safe traffic flow in the vicinity of the Work. Contractor shall use signs, barricades, delineators, flashers, and flagmen, all in strict compliance with Federal, State, and local rules and regulations regarding traffic control. Public roadways shall not be barricaded or blockaded except in accordance with requirements of public agencies having jurisdiction over same. Contractor shall provide access to all walkways, sidewalks, driveways, and streets at all times. If requested by the Owner, Contractor shall furnish a traffic control program for the Work.

i. Vegetation and Wildlife

Contractor shall not destroy or disturb any vegetation or habitat unless absolutely necessary for the performance of the Work. Contractor shall take all steps necessary to ensure that his employees do not destroy or disturb any vegetation or wildlife in the prosecution of the Work or incidental thereto, including travel to and from the Work site.

j. Water Pollution

Contractor shall discard materials which might adversely affect ground or surface water at approved dump sites only. Chemicals and other water pollutants shall not be discharged into natural watercourses or on land tributary to said watercourses. Contractor shall comply with all applicable Federal, State, and local water pollution control regulations.

k. Cleanup

Contractor shall keep the premises occupied by him in a neat, clean condition free from unsightly accumulation of rubbish. Contractor shall maintain all Work areas within or without the project limits free from dust which would cause a hazard to the Work, operations of other contractors, or other persons or property. Upon completion of the Work, Contractor shall at his own expense satisfactorily dispose of or remove from the vicinity of the Work all plants, building, rubbish, unused materials, concrete forms, and other equipment and materials belonging to him or used under his direction during construction and, if he fails to do so, the same may be removed and disposed of by the Owner at Contractor's expense.

SECTION 03100
BASIC CONCRETE FORMWORK SPECIFICATIONS

PART 1 - GENERAL

1.01 General Requirements

Contractor shall furnish all materials for concrete formwork, bracing, shoring, and supports and shall design and construct all falsework, all in accordance with the provisions of the Contract Document.

1.02 Reference Specifications, Codes, and Standards

A. Codes

The Building Code, as referenced herein, shall be the California Building Code (CBC) of the California Building Standards Commission, latest edition.

B. Commercial Standards

ACI 347 Guide to Formwork for Concrete, latest edition.

1.03 Contractor Submittals

All submittals shall be in accordance with Section 01300, Contractor Submittals Technical Specifications.

A. Falsework Calculations and Drawings

Contractor shall comply with the provisions of Section 1717 of the Division of Industrial Safety, Construction Safety Orders, as revised November 1973, which requires that all falsework or vertical shoring installations where the heights of the falsework or vertical shoring, as measured from the top of the sills to the soffit of the superstructure, exceeds 14 feet, or where individual horizontal span lengths exceed 16 feet, or provision for vehicular or railroad traffic through falsework or vertical shoring is made, shall be approved and signed by a Civil Engineer, registered in the State of California; provided further, that a copy of the falsework plan or shoring layout shall be available on the job site at all times.

B. Contractor shall submit detailed plans of the falsework proposed to be used. Such plans shall be in sufficient detail to indicate the general layout, sizes of members, anticipated stresses, grade of materials to be used in the falsework, and typical soil conditions.

1.04 Quality Assurance

Tolerances

The variation from established grade, line, plumbness, or thickness shall be as set forth in Part 1.04F of Section 03300, Basic Concrete Specifications, and there shall be no offsets or

visible waviness in the finished surface. All other tolerances shall be as specified in Chapter 3 of ACI 347.

PART 2 - PRODUCTS

2.01 General

Except as otherwise expressly accepted by the Engineer, all lumber brought on the job site for use as forms, shoring, or bracing shall be new materials. All forms shall be smooth surface forms and shall be of the following materials:

Walls	-	Steel or plywood panel
Columns	-	Steel, plywood, or fiber glass
Roof and Floor slabs	-	Plywood
All other work	-	Steel panels, plywood or tongue and groove lumber

2.02 Form and Falsework Materials

- A. Materials for concrete forms, formwork, and falsework shall conform to the following requirements:
1. Lumber shall be Douglas Fir or Southern Pine, construction grade or better, in conformance with U.S. Product Standard PS20, American Softwood Lumber Standard.
 2. Plywood for concrete formwork shall be new, waterproof, synthetic resin bonded, exterior type Douglas Fir or Southern Pine plywood manufactured especially for concrete formwork and shall conform to the requirements of PS 1, Structural Plywood, for Concrete Forms, Class I, and shall be edge sealed.
 3. Form materials shall be metal, wood, plywood, or other approved material that will not adversely affect the concrete and will facilitate placement of concrete to the shape, form, line, and grade shown. Metal forms shall be an approved type that will accomplish such results. Wood forms for surfaces to be painted shall be Medium Density Overlaid plywood, MDO Ext. Grade.
- B. Unless otherwise shown, exposed edges and corners in concrete members shall be provided with 3/4-inch chamfers. Re-entrant corners in concrete members shall not have fillets unless otherwise shown.
- C. Forms and falsework to support the roof and floor slabs shall be designed for the total dead load, plus a live load of 30 psf (minimum).

2.03 Form Ties

- A. Form ties with integral waterstops shall be provided with a plastic cone or other suitable means for forming a conical hole to insure that the form tie may be broken off back of the face of the concrete. The maximum diameter of removable cones for rod ties, or of other removable form-tie fasteners having a circular cross-section, shall not exceed

1-1/2 inches; and all such fasteners shall be such as to leave holes of regular shape for reaming.

- B. Form ties for water-retaining structures shall have integral waterstops. Removable taper ties may be used when approved by the Engineer. A preformed neoprene or polyurethane tapered plug sized to seat at the center of the wall shall be inserted in the hole left by the removal of the taper tie.

PART 3 - EXECUTION

3.01 General

- A. Forms to confine the concrete and shape it to the required lines shall be used wherever necessary. Contractor shall assume full responsibility for the adequate design of all forms, and any forms which are unsafe or inadequate in any respect shall promptly be removed from the work and replaced at the Contractor's expense. A sufficient number of forms of each kind shall be provided to permit the required rate of progress to be maintained. The design and inspection of concrete forms, falsework, and shoring shall comply with applicable local, state and federal regulations. Plumb and string lines shall be installed before concrete placement and shall be maintained during placement. Such lines shall be used by the Contractor's personnel and by the Engineer and shall be in sufficient number and properly installed. During concrete placement, the Contractor shall continually monitor plumb and string line form positions and immediately correct deficiencies.
- B. Concrete forms shall conform to the shape, lines, and dimensions of members as called for on the Contract Drawings, and shall be substantial, free from surface defects, and sufficiently tight to prevent leakage. Forms shall be properly braced or tied together to maintain their position and shape under a load of freshly-placed concrete. If adequate foundation for shores cannot be secured, trussed supports shall be provided.

3.02 Form Design

All forms shall be true in every respect to the required shape and size, shall conform to the established alignment and grade, and shall be of sufficient strength and rigidity to maintain their position and shape under the loads and operations incident to placing and vibrating the concrete. Suitable and effective means shall be provided on all forms for holding adjacent edges and ends of panels and sections tightly together and in accurate alignment so as to prevent the formation of ridges, fins, offsets, or similar surface defects in the finished concrete. Plywood, 5/8-inch and greater in thickness, may be fastened directly to studding if the studs are spaced close enough to prevent visible deflection marks in the concrete. Forms shall be tight so as to prevent the loss of water, cement and fines during placing and vibrating of the concrete. Specifically, the bottom of wall forms that rest on concrete footings or slabs shall be provided with a gasket to prevent loss of fines and paste during placement and vibration of concrete. Such gasket may be a 1 to 1-1/2 inch diameter polyethylene rod held in position to the underside of the wall form. Adequate clean-out holes shall be provided at the bottom of each lift of forms. The size, number, and location of such clean-outs shall be as acceptable to the Engineer.

3.03 Construction

A. Vertical Surfaces

All vertical surfaces of concrete members shall be formed, except where placement of the concrete against the ground is shown. Not less than 1-inch of concrete shall be added to the thickness of the concrete member as shown where concrete is permitted to be placed against trimmed ground in lieu of forms. Such permission will be granted only for members of comparatively limited height and where the character of the ground is such that it can be trimmed to the required lines and will stand securely without caving or sloughing until the concrete has been placed.

B. Construction Joints

Concrete construction joints shall not be placed at locations other than those shown or specified, except as may be acceptable to the Engineer. When a second lift is placed on hardened concrete, special precautions shall be taken in the way of the number, location, and tightening of ties at the top of the old lift and bottom of the new to prevent any unsatisfactory effect whatsoever on the concrete. Pipe stubs and anchor bolts shall be set in the forms where required.

C. Form Ties

1. **Embedded Ties:** Holes left by the removal of form tie cones shall be reamed with suitable toothed reamers so as to leave the surface of the holes clean and rough before being filled with mortar as specified in Part 3.12C of Section 03300, Basic Concrete Specifications. Wire ties for holding forms shall not be used. Form-tying devices or parts thereof, other than metal, shall not be left embedded in the concrete. Ties shall not be removed in such manner as to leave a hole extending through the interior of the concrete members. Contractor shall not use snap-ties which cause spalling of the concrete upon form stripping or tie removal. If steel panel forms are used, rubber grommets shall be provided where the ties pass through the form in order to prevent loss of cement paste. Where metal rods extending through the concrete are used to support or to strengthen forms, the rods shall remain embedded and shall terminate not less than 1-inch back from the formed face or faces of the concrete.
2. **Removable Ties:** Where taper ties are approved for use, the larger end of the taper tie shall be on the wet side of walls in water retaining structures. After the taper tie is removed, the hole shall be thoroughly cleaned and roughened for bond. A precast neoprene or polyurethane tapered plug shall be located at the wall centerline. The hole shall be completely filled with non-shrink grout for water bearing and below-grade walls. The hole shall be completely filled with non-shrink or regular cement grout for above-grade walls which are dry on both sides. Exposed faces of walls shall have the outer 2 inches of the exposed face filled with a cement grout which shall match the color and texture of the surrounding wall surface.

3.04 Reuse of Forms

Forms may be reused only if in good condition and only if acceptable to the Engineer. Light sanding between uses will be required wherever necessary to obtain uniform surface texture on all exposed concrete surfaces. Exposed concrete surfaces are defined as surfaces which are permanently exposed to view. In the case of forms for the inside wall surfaces of hydraulic/water retaining structures, unused tie rod holes in forms shall be covered with metal caps or shall be filled by other methods acceptable to the Engineer.

3.05 Removal of Forms

Careful procedures for the removal of forms shall be strictly followed, and this work shall be done with care so as to avoid injury to the concrete. Contractor shall not apply heavy loading on green concrete. In the case of roof slabs and above-ground floor slabs, forms shall remain in place until test cylinders for the roof concrete attain a minimum compressive strength of 75 percent of the 28-day strength specified in Section 03300, Basic Concrete Specifications; provided, that no forms shall be disturbed or removed under an individual panel or unit before the concrete in the adjacent panel or unit has attained 75 percent of the specified 28-day strength and has been in place for a minimum of 14 days. The time required to establish said strength shall be as determined by the Engineer who will make several test cylinders for this purpose from concrete used in the first group of roof panels placed. If the time so determined is more than the 14-day minimum, then that time shall be used as the minimum length of time. Forms for all vertical foundations, walls, and columns shall remain in place at least 48 hours after the concrete has been placed (commencing from the time the last concrete is placed for that day). Forms for all parts of the work not specifically mentioned herein shall remain in place for periods of time as determined by the Engineer.

3.06 Maintenance of Forms

Forms shall be maintained at all times in good condition, particularly as to size, shape, strength, rigidity, tightness, and smoothness of surface. Forms, when in place, shall conform to the established alignment and grades. Before concrete is placed, forms shall be thoroughly cleaned. Form surfaces shall be treated with a nonstaining mineral oil or other lubricant acceptable to the Engineer. Any excess lubricant shall be satisfactorily removed before placing the concrete. Where field oiling of forms is required, Contractor shall perform the oiling at least two weeks in advance of their use. Oil shall be kept off the surfaces of steel reinforcement and other metal items to be embedded in concrete. If oil is inadvertently placed on said metal surfaces, Contractor shall remove oil by sandblasting.

3.07 Falsework

- A. Contractor shall be responsible for the design, engineering, construction, maintenance, and safety of all falsework, including staging, walkways, forms, ladders, and similar appurtenances, which shall equal or exceed the applicable requirements of the provisions of the OSHA Safety and Health Standards for Construction, the requirements of the Construction Safety Orders of the California Division of Industrial Safety, and the requirements specified herein.

- B. All falsework shall be designed and constructed to provide the necessary rigidity and to support the loads. Falsework for the support of a superstructure shall be designed to support the loads that would be imposed if the entire superstructure were placed at one time.
- C. Falsework shall be placed upon a solid footing, safe against undermining, and protected from softening. When the falsework is supported on timber piles, the maximum calculated pile loading shall not exceed 20 tons. When falsework is supported on any portion of the structure which is already constructed, the load imposed by the falsework shall be spread, distributed, and braced in such a way as to avoid any possibility of damage to the structure.

END OF SECTION

SECTION 03200
BASIC CONCRETE REINFORCEMENT SPECIFICATIONS

PART 1 - GENERAL

1.01 General Requirements

Contractor shall furnish, fabricate, and place all concrete reinforcement steel, welded wire reinforcement, couplers, and concrete inserts for use in reinforced concrete and masonry construction and shall perform all appurtenant work, including all the wires, clips, supports, chairs, spacers, and other accessories, all in accordance with the Contract Documents.

1.02 Reference Specifications, Codes, and Standards

A. Codes

The Building Code, as referenced herein, shall be the California Building Code (CBC) of the California Building Standards Commission, latest edition.

B. Commercial Standards

Where not covered in this specification, all work shall comply with the following standards, latest editions:

ACI 315	Details and Detailing of Concrete Reinforcement.
ACI 318	Building Code Requirements for Structural Concrete and Commentary.
WRI	Manual of Standard Practice for Structural Welded Wire Reinforcement.
AWS D1.4	Structural Welding Code - Reinforcing Steel.
CRSI	Manual of Standard Practice.

1.03 Contractor Submittals

All submittals shall be in accordance with the Contractor Submittals Technical Specifications, Section 01300.

- A. Contractor shall furnish shop bending diagrams, placing lists, and drawings of all reinforcement steel prior to fabrication.
- B. Details of concrete reinforcement steel and concrete inserts shall be submitted by the Contractor at the earliest possible date after receipt by the Contractor of Notice to Proceed. Said details of reinforcement steel for fabrication and erection shall conform to ACI 315 and the requirements specified and shown. Shop bending diagrams shall show the actual lengths of bars, to the nearest inch measured to the intersection of the

extensions (tangents for bars of circular cross section) of the outside surface. Shop drawings shall include bar placement diagrams which clearly indicate the dimensions of each bar splice.

- C. Where mechanical couplers are required or permitted to be used to splice reinforcement steel, Contractor shall submit manufacturer's literature which contains instructions and recommendations for installation for each type of coupler used; certified test reports which verify the load capacity of each type and size of coupler used; and shop drawings which show the location of each coupler with details of how they are to be installed in the formwork.
- D. If reinforcement steel is spliced by welding at any location, Contractor shall submit mill test reports which shall contain the information necessary for the determination of the carbon equivalent as specified in AWS D1.4. Contractor shall submit a written welding procedure for each type of weld for each size of bar which is to be spliced by welding; merely a statement that AWS procedures will be followed is not acceptable.

1.04 Quality Assurance

- A. If requested by the Engineer, Contractor shall provide samples from each heat of reinforcement steel delivered in a quantity adequate for testing. Costs of initial tests will be paid by the Owner. Costs of additional tests due to material failing initial tests shall be paid by the Contractor.
- B. If reinforcement steel is spliced by welding at any location, Contractor shall submit certifications of procedure qualifications for each welding procedure used and certification of welder qualifications, for each welding procedure, and for each welder performing the work. Such qualifications shall be as specified in AWS D1.4.
- C. If requested by the Engineer, Contractor shall provide samples of each type of welded splice used in the work in a quantity and of dimensions adequate for testing. At the discretion of the Engineer, radiographic testing of direct butt welded splices will be performed. Contractor shall provide assistance necessary to facilitate testing. Contractor shall repair any weld which fails to meet the requirements of AWS D1.4. The costs of testing will be paid by the Owner; except, the costs of all tests which fail to meet specified requirements shall be paid by the Contractor.

PART 2 - PRODUCTS

2.01 Reinforcement Steel

- A. All reinforcement steel for all cast-in-place reinforced concrete construction shall conform to the following requirements:
 - 1. Bar reinforcement shall conform to the requirements of ASTM A 615 for Grade 60 Billet Steel Reinforcement with supplementary requirement S-1, or as otherwise shown.

2. Welded wire reinforcement shall conform to the requirements of ASTM A 185 and the details shown; provided, that welded wire reinforcement with longitudinal wire of W9.5 size wire shall be either furnished in flat sheets or in rolls with a core diameter of not less than 10 inches; and provided further, that welded wire reinforcement with longitudinal wires larger than W9.5 size shall be furnished in flat sheets only.
3. Spiral reinforcement shall be cold-drawn steel wire conforming to the requirements of ASTM A 82.

B. Accessories

1. Accessories shall include all necessary chairs, slab bolsters, concrete blocks, tie wires, dips, supports, spacers, and other devices to position reinforcement during concrete placement. Slab bolsters shall have gray plastic-coated legs.
2. Concrete blocks (dobies), used to support and position reinforcement steel, shall have the same or higher compressive strength as specified for the concrete in which it is located. Where the concrete blocks are used on concrete surfaces exposed to view, the color and texture of the concrete blocks shall match that required for the finished surface. Wire ties shall be embedded in concrete block bar supports.

2.02 Mechanical Couplers

- A. Mechanical couplers shall be provided where shown and where approved by the Engineer. The couplers shall develop a tensile strength which exceeds 125 percent of the yield strength of the reinforcement bars being spliced at each splice.
- B. Where the type of coupler used is composed of more than one component, all components required for a complete splice shall be supplied. This shall apply to all mechanical splices, including those splices intended for future connections.
- C. The reinforcement steel and coupler used shall be compatible for obtaining the required strength of the connection.
- D. Couplers which are located at a joint face shall be a type which can be set either flush or recessed from the face as shown. The couplers shall be sealed during concrete placement to completely eliminate concrete or cement paste from entering. After the concrete is placed, Contractor shall plug and seal couplers intended for future connections to prevent any contact with water or other corrosive materials. Threaded couplers shall be plugged with plastic plugs which have an O-ring seal.

2.03 Welded Splices

- A. Welded splices shall be provided where shown and where approved by the Engineer. All welded splices of reinforcement steel shall develop a tensile strength which exceeds 125 percent of the yield strength of the reinforcement bars which are connected.

- B. All materials required to perform the welded splices to the requirements of AWS D1.4 shall be provided.

PART 3 - EXECUTION

3.01 General

All reinforcement steel, welded wire reinforcement, couplers, and other appurtenances shall be fabricated, and placed in accordance with the requirements of the Building Code and the supplementary requirements specified herein.

3.02 Fabrication

A. General

Reinforcement steel shall be accurately formed to the dimensions and shapes shown, and the fabricating details shall be prepared in accordance with ACI 315 and ACI 318, except as modified by the Drawings. Stirrups and tie bars shall be bent around a pin having a diameter not less than 1-1/2 inch for No. 3 bars, 2-inch for No. 4 bars, and 2-1/2 inch for No. 5 bars. Bends for other bars shall be made around a pin having a diameter not less than 6 times the minimum thickness, except for bars larger than 1 inch, in which case the bends shall be made around a pin of 8 bar diameters. Bars shall be bent cold.

- B. Contractor shall fabricate reinforcement bars for structures in accordance with bending diagrams, placing lists, and placing drawings.

C. Fabricating Tolerances

Bars used for concrete reinforcement shall meet the following requirements for fabricating tolerances:

1. Sheared length: ± 1 inch
2. Depth of truss bars: $+ 0, - 1/2$ inch
3. Stirrups, ties, and spirals: $\pm 1/2$ inch
4. All other bends: ± 1 inch

3.03 Placing

A. Placing

Reinforcement steel shall be accurately positioned as shown, and shall be supported and wired together to prevent displacement, using annealed iron wire ties or suitable clips at intersections. All reinforcement steel shall be supported by concrete, plastic or metal supports, spaces or metal hangers which are strong and rigid enough to prevent any displacement of the reinforcement steel. Where concrete is to be placed on the ground, supporting concrete blocks (or dobies) shall be used, in sufficient numbers to support the

bars without settlement, but in no case shall such support be continuous. All concrete blocks used to support reinforcement steel shall be tied to the steel with wire ties which are embedded in the blocks. For concrete over formwork, Contractor shall furnish concrete, metal, plastic, or other acceptable bar chairs and spacers.

- B. The portions of all accessories in contact with the formwork shall be made of concrete, plastic, or steel coated with a 1/8 inch minimum thickness of plastic which extends at least 1/2 inch from the concrete surface. Plastic shall be gray in color.
- C. Tie wires shall be bent away from the forms in order to provide the specified concrete coverage.
- D. Bars additional to those shown which may be found necessary or desirable by the Contractor for the purpose of securing reinforcement in position shall be provided by the Contractor at its own expense.

E. Placing Tolerances

Unless otherwise specified, reinforcement placing tolerances shall be within the limits specified in Section 7.5, Placing Reinforcement, of ACI 318 except where in conflict with the requirements of the Building Code.

- F. Bars may be moved as necessary to avoid interference with other reinforcement steel, conduits, or embedded items. If bars are moved more than one bar diameter, or enough to exceed the above tolerances, the resulting arrangement of bars shall be as acceptable to the Engineer.
- G. Welded wire reinforcement placed over horizontal forms shall be supported on slab bolsters having gray, plastic-coated standard type legs as specified in Paragraph B herein. Slab bolsters shall be spaced not less than 30 inches on centers, shall extend continuously across the entire width of the reinforcement mat, and shall support the reinforcement mat in the plane shown.
- H. Welded wire reinforcement placed over the ground shall be supported on wired concrete blocks (dobies) spaced not more than 3 feet on centers in any direction. Contractor shall not utilize the construction practice of placing welded wire reinforcement on the ground and hooking into place in the freshly placed concrete.

3.04 Spacing of Bars

- A. The clear distance between parallel bars (except in columns and between multiple layers of bars in beams) shall be not less than the nominal diameter of the bars nor less than 1-1/3 times the maximum size of the coarse aggregate, nor less than 1 inch.
- B. Where reinforcement in beams or girders is placed in 2 or more layers, the clear distance between layers shall be not less than 1 inch.
- C. In columns, the clear distance between longitudinal bars shall be not less than 1-1/2 times the bar diameter, not less than 1-1/2 times the maximum size of the coarse aggregate, nor less than 1-1/2 inches.

- D. The clear distance between bars shall also apply to the distance between a contact splice and adjacent splices or bars.

3.05 Splicing

- A. General

Reinforcement bar splices shall only be used at locations shown. When it is necessary to splice reinforcement at points other than where shown, the character of the splice shall be as acceptable to the Engineer.

- B. Splices of Reinforcement

The length of lap for reinforcement bars, unless otherwise shown shall be in accordance with ACI 318, Section 12.15.1 for a Class B splice.

- C. Laps of welded wire reinforcement shall be in accordance with the ACI 318. Adjoining sheets shall be securely tied together with No. 14 tie wire, one tie for each 2 running feet. Wires shall be staggered and tied in such a manner that they cannot slip.

- D. Splices in column spiral reinforcement, when necessary, shall be made by welding or by a lap of 1-1/2 turns.

- E. Bending or Straightening

Reinforcement shall not be straightened or rebent in a manner which will injure the material. Bars with kinks or bends not shown shall not be used. All bars shall be bent cold, unless otherwise permitted by the Engineer. No bars partially embedded in concrete shall be field-bent except as shown or specifically permitted by the Engineer.

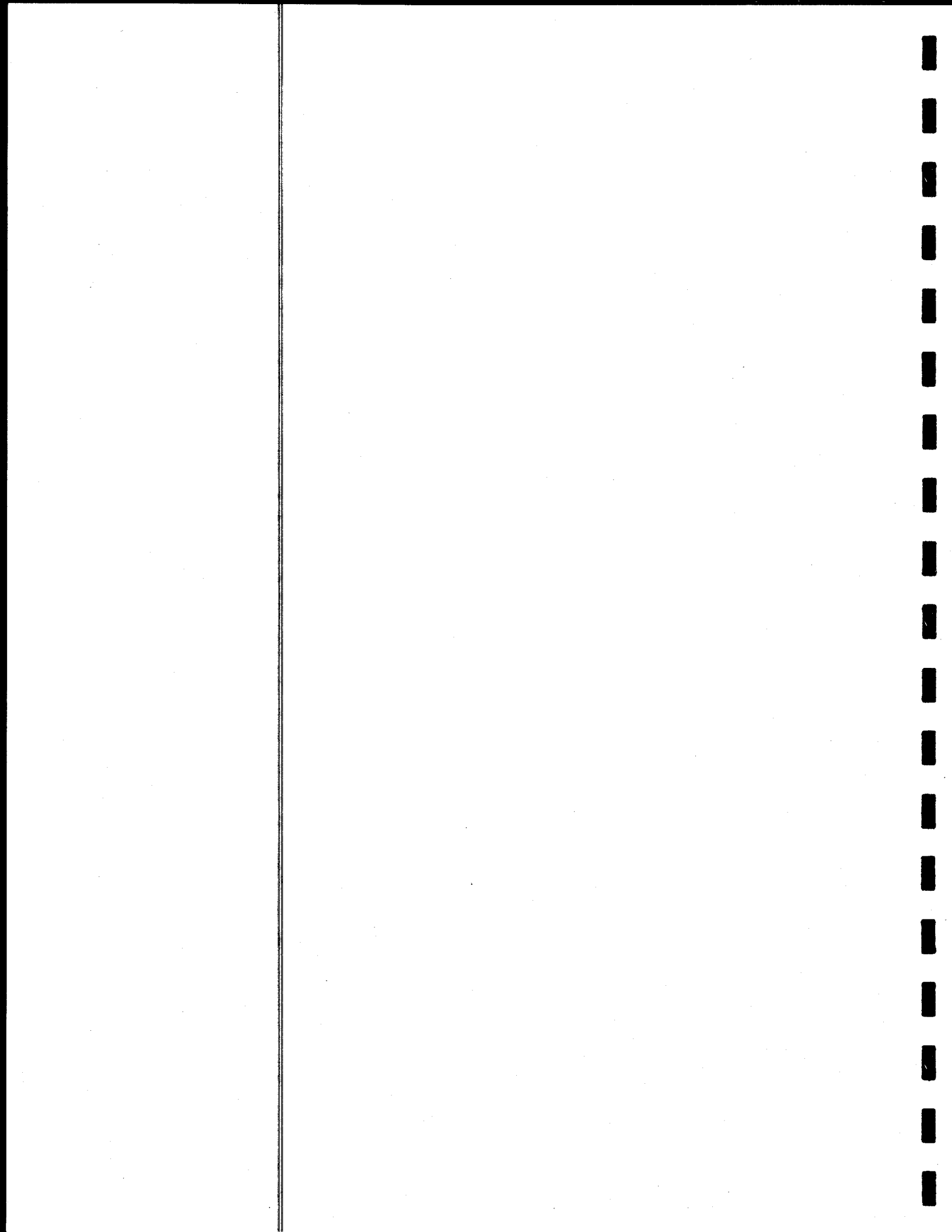
3.06 Cleaning and Protection

- A. Reinforcement steel shall at all times be protected from conditions conducive to corrosion until concrete is placed around it.

- B. The surfaces of all reinforcement steel and other metalwork to be in contact with concrete shall be thoroughly cleaned of all dirt, grease, loose scale and rust, grout, mortar and other foreign substances immediately before the concrete is placed. Where there is delay in depositing concrete, reinforcement shall be reinspected and, if necessary recleaned.

END OF SECTION

**COACHELLA VALLEY WATER DISTRICT
TECHNICAL SPECIFICATIONS**



SECTION 02210 - CONTROLLED LOW STRENGTH MATERIAL (CLSM)

PART 1 -- GENERAL

1.1 THE REQUIREMENT

- A. The CONTRACTOR shall provide Controlled Low Strength Material (CLSM), complete and in place, in accordance with the Contract Documents.

1.2 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Commercial Standards

ASTM C 33	Standard Specification for Concrete Aggregates
ASTM C 94	Standard Specification for Ready-Mixed Concrete
ASTM C 138	Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete
ASTM C 150	Standard Specification for Portland Cement
ASTM C 260	Standard Specification for Air-Entraining Admixtures for Concrete
ASTM C 403	Standard Test Method for Time of Setting of Concrete Mixtures by Penetration Resistance
ASTM C 494	Standard Specification for Chemical Admixtures for Concrete
ASTM C 618	Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
ASTM D 4318	Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D4832	Standard Test Method for Preparation and Testing of Controlled Low-Strength Material (CLSM) Test Cylinders
ASTM D 5971	Standard Practice for Sampling Freshly Mixed Controlled Low-Strength Material

ASTM D 6023 Standard Test Method for Density (Unit Weight), Yield, Cement Content, and Air Content (Gravimetric) of Controlled Low Strength Material (CLSM)

ASTM D 6024 Standard Test Method for Ball Drop on Controlled Low Strength Material (CLSM) to Determine Suitability for Load Application

ASTM D 6103 Standard Test Method for Flow Consistency of Controlled Low Strength Material (CLSM)

- B. Standard Specification: Standard Specifications for Public Works Construction (SSPWC or GREEN BOOK).

1.3 CONTRACTOR SUBMITTALS

- A. Submittals shall be made in accordance with Section 01300, Submittals.

- B. Shop Drawings:

1. CLSM mix designs which show the proportions and gradations of all materials proposed for each type of CLSM indicated. Each mix design shall be accompanied by independent laboratory test results of the indicated properties.
2. If the CONTRACTOR proposes to provide lower strength CLSM with aggregates that do not conform to ASTM C 33 - Standard Specification for Concrete Aggregates, Shop Drawings shall include a testing program that will be used to control the variability of the aggregates. The testing program shall be acceptable to the ENGINEER.

1.4 QUALITY ASSURANCE

- A. All testing will be done by a testing laboratory selected by the OWNER at the OWNER'S expense, except as otherwise indicated.

- B. If tests of the CLSM shown non-compliance with the specifications, the CONTRACTOR shall make changes as may be required to achieve compliance. Performing and paying for subsequent testing to show compliance shall be the CONTRACTOR'S responsibility.

- C. Correlation Tests:

1. The CONTRACTOR shall perform a field correlation test for each mix of CLSM used in pipe zone, trench zone, or backfill used in amounts greater than 100 cubic yards or when CLSM is required to support traffic or other live loads on the fill less than 7 days after placing CLSM.
2. Field correlation tests shall be performed in a test pit similar in cross section to the WORK and at least 10-feet long at a location near the WORK. The proposed location shall be acceptable to the ENGINEER.

3. Laboratory and field tests shall be performed on samples taken from the same CLSM batch mix. All tests shall be performed by a laboratory at the CONTRACTOR's expense.
4. Testing shall be performed once each 2-hours during the first 8-hours, once each 8-hours during the first week, and once each 24-hours until the CLSM mix reaches the maximum design strength. The unconfined compressive strength at 7 days shall be a minimum of 100 psi and a maximum of 300 psi. Final mix approval and use of the material shall not occur prior to confirmation of strength by the cylinder breaks.
 - a. CLSM shall be tested in accordance with ASTM D 4832, ASTM D 5971, ASTM D 6023, and ASTM D6103.
 - b. Setting test shall be in accordance with ASTM C 403 - Standard Test Method for Time of Setting of Concrete Mixtures by Penetration Resistance.
 - c. Density tests shall be in accordance with ASTM C 138 - Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete.

PART 2 -- PRODUCTS

2.1 CONTROLLED LOW STRENGTH MATERIAL

- A. CLSM shall consist of a mixture of Portland cement, pozzolan, fly ash, coarse and fine aggregate, water, and approved admixtures, mixed in accordance with ASTM C 94-Ready Mixed Concrete and conforming to the following requirements:
 - a. Portland Cement:
 - 1) Cement shall be Type V in accordance with ASTM C 150- Standard Specification for Portland Cement
 - b. Pozzolan:
 - 1) Pozzolan shall be Type F or C in accordance with ASTM C 618-P Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in as a Mineral Admixture in Portland Cement Concrete. Pozzolon content, by weight, in Normal CLSM shall not be greater than cement content.
 - c. Fly Ash:
 - 1) Fly Ash shall be Class C in accordance with ASTM C 618 or approved alternate.
 - d. Aggregate:
 - 1) Aggregate shall consist of a well-graded mixture of crushed rock, soil, or sand, with a nominal maximum size of 3/8-inch. On hundred percent shall pass the 3/4-inch sieve; no more than 30 percent shall be retained on the 3/8-inch sieve; and no more than 12 percent shall pass the

number 200 sieve. If more than 5 percent of the aggregate passes the number 200 sieve, the material passing the number 200 sieve shall have a plastic index of less than $0.73 \times (\text{liquid Limit} - 20)$, when tested in accordance with ASTM D 4318- Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils. All aggregate shall be free from organic matter and shall not contain more alkali, sulfates, or salts than the native materials at the SITE.

e. Water:

- 1) Water shall be potable quality, clean free from objectionable quantities of silt, organic matter, alkali, salt, and other impurities.

f. Admixtures:

- 1) Air entraining admixtures shall be in accordance with ASTM C 260- Standard Specification for Air-Entraining Admixtures for Concrete
- 2) Water reducing admixtures shall be in accordance with ASTM C 494- Standard Specification for Chemical Admixtures for Concrete

B. Composition.

- a. Proportion the CLSM to be a flowable, nonsegregating, self-consolidating low shrink slurry. The CONTRACTOR shall determine the materials and proportions used to meet the requirements of these Specifications
- b. Entrained air content shall be between 0 percent minimum and 30 percent maximum
- c. Water reducing agent content as necessary

C. Properties:

- a. Density shall be 145 pounds per cubic foot maximum
- b. Slump shall be as required by the CONTRACTOR's methods, but shall not promote segregation nor shall slump exceed 10 inches.
- c. Compressive strength at 28 days:
 - 1) Normal CLSM: Between 100 psi minimum and 300 psi maximum. Unless specifically indicated otherwise, all CLSM shall be Normal CLSM.

PART 3 -- EXECUTION

3.1 BATCHING, MIXING AND DELIVERY

- A. Batching, mixing, and delivery of CLSM shall conform to ASTM C 94. CLSM shall be mixed at a batch plant acceptable to the ENGINEER and shall be delivered in standard

transit mix trucks. Alternatively, the CONTRACTOR can mix and deliver the CLSM to the trench in ready-mix trucks used for CLSM mixing and placement work as accepted by the ENGINEER.

3.2 PLACEMENT OF CLSM

- A. Following placement and anchoring of the pipe, remove all loose soil from trench walls and floor. Remove any unstable soil at the top of the trench, which might fall into the trench during placement of the CLSM.
- B. Prior to placement of CLSM, the pipeline temperature shall be controlled. The temperature of the CLSM discharged into the trench shall be between 50 and 90° F. CLSM shall not be placed when the air temperature is below 40° F. No CLSM shall be placed against frozen subgrade or other materials having temperature less than 32° F.
- C. Deliver the CLSM to the trench in ready-mix trucks and utilize tailgate discharge, conveyor belts, pump or chutes to place the CLSM in the trench. Direct CLSM to one side of the pipe, taking care not to displace the pipe at any time. Continue placing CLSM on one side of the pipe until CLSM has gone under the pipe and up the other side to a depth of 1.5 feet above the pipe bottom. Use at least two hand-held vibrators to continuously liquefy and move CLSM into all voids. Avoid over-consolidation which causes separation of aggregate sizes. Adjust water in mixture to maintain fluid consistency but maintain strength requirements. Continue placing CLSM on both sides of the pipe continuously using two vibrators for every 30 feet of pipe run.
- D. Maintain stability of pipe throughout CLSM placement. CLSM will likely require placement in lifts to prevent pipe flotation. No movement of the pipe caused by flotation will be allowed. If any movement occurs, the CLSM material shall be removed and the pipe placed back on line and grade. Any damage to the pipeline system caused by movement of the pipe shall be removed and/or repaired in full conformance with these Contract Documents at no additional cost to the OWNER. Remove all sloughed material or other debris from top of previously placed CLSM.
- E. CLSM shall be continuously placed against fresh material unless otherwise approved by the CONSTRUCTION MANAGER. When new material is placed against existing CLSM, the placement area shall be free from all loose and foreign material. The surface of the existing material shall be soaked a minimum of one hour before placement of fresh material but no standing water shall be allowed when placement begins.

3.3 FINISHING

- A. The finish surface shall be smooth and to the grade indicated or directed by the ENGINEER. Surfaces shall be free from fins, bulges, ridges, offsets, and honeycombing. Finished by wood float, steel trowel, or similar methods is not required.

3.4 CURING

- A. CLSM shall be kept damp for a minimum of 7 days or until backfill is placed.
- B. Structures shall not be constructed on CLSM backfill until the CLSM has obtained a 7-day minimum cure.

3.5 PROTECTION

- A. CLSM shall be protected from freezing for 72 hours after placement.
- B. CLSM shall be protected from running water, rain, and other damage until the material has been accepted and final fill completed.

- END OF SECTION -

SECTION 02621

STABILIZATION FABRIC

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: Woven stabilization fabric used for subgrade enhancement.

1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 1. D 3786 - Standard Test Method for Hydraulic Bursting Strength of Textile Fabric: Diaphragm Brushing Strength Tester Method.
 2. D 4533 - Standard Test Method for Trapezoid Tearing Strength of Geotextiles.
 3. D 4632 - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.
 4. D 4833 - Standard Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products.

1.03 DEFINITIONS

- A. Stabilization Fabric: Woven geotextile fabric manufactured from polypropylene yarns.

1.04 SUBMITTALS

- A. Product data.
- B. Samples.
- C. Quality Control Submittals:
 1. Certificates of Compliance.
 2. Manufacturer's Installation Instructions.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Storage and Protection:
 1. Furnish stabilization fabric in protective covers capable of protecting the fabric from ultraviolet rays, abrasion, and water.

1.06 PROJECT CONDITIONS

- A. Field Measurements:
 1. Take field measurements to determine the exact lengths and dimensions of the surfaces to receive the fabric.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. One of the Following or Equal:
1. Mirafi Filterweave 700.

2.02 MATERIAL REQUIREMENTS

- A. Physical Properties: Meet the following minimum requirements.

Property ⁽¹⁾	Test Method	Requirements ⁽¹⁾
Grab Tensile Strength	ASTM D 4632	250 pounds
Mullen Burst Strength	ASTM D 3786	480 pounds per square inch
Trapezoid Tear Strength	ASTM D 4533	60 pounds
Puncture Strength	ASTM D 4833	135 pounds
(1) Minimum average roll values.		

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verification of Conditions: Verify that conditions are satisfactory for the installation of stabilization fabric.

3.02 PREPARATION

- A. Surface Preparation: During grading operations, take care not to disturb the subgrade. This may require use of lightweight dozers for low strength soils such as saturated, cohesionless, or low cohesion soils.
- B. Prior to Placement of Fabric: Prepare surface to smooth condition free of debris, depressions, or obstructions that may damage the fabric.

3.03 INSTALLATION

- A. Follow manufacturer's installation instructions and as complimented herein.
- B. Place the stabilization fabric smoothly without folds or wrinkles.
- C. Use special care when placing the stabilization fabric in contact with the soil so that no void spaces occur between the stabilization fabric and the prepared surface.
- D. Overlap the parallel rolls and ends of rolls a minimum of 24 inches and not less than recommended by manufacturer.
- E. Do not drag stabilization fabric across subgrade.
- F. Make overlaps at ends of rolls in the direction of the aggregate placement with the previous roll on top.

- G. Use lightweight dozers if necessary. Do not allow equipment directly on stabilization fabric.

3.04 FIELD QUALITY CONTROL

- A. Inspection: Before covering, the condition of the fabric may be observed by the OWNER to determine that no holes or rips exist in the fabric. Repair all holes or rips by placing a new layer of fabric extending beyond the defect in all directions a distance equal to the minimum overlap required for adjacent rolls.

END OF SECTION

SECTION 02740

GEOGRID REINFORCEMENT

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes - Geogrid reinforcement for subgrade improvement in the construction of structures and trenches.

1.02 REFERENCES

- A. American Association of State Highway and Transportation Officials (AASHTO)
 - 1. AASHTO Recommended Practice for Geosynthetic Reinforcement of the Aggregate Base Course of Flexible Pavement Structures, AASHTO PP46-01, April 2001 Interim Edition of the AASHTO Provisional Standards.
 - 2. Standard Specification for Highway Bridges (1997 Interim)
 - 3. AASHTO Guide for Design of Pavement Structures (1993)
- B. American Society for Testing and Materials (ASTM)
 - 1. D1388-96 - Standard Test Method for Stiffness of Fabrics, Option A
 - 2. D6637-01- Standard Test Method for Determining Tensile Properties of Geogrids by the Single or Multi-rib Tensile Method
 - 3. D4354-96 - Practice for Sampling of Geosynthetics for Testing
 - 4. D4759-92 - Practice for Determining the Specification Conformance of Geosynthetics
 - 5. D5818-95 - Practice for Obtaining Samples of Geosynthetics from a Test Section for Assessment of Installation Damage
- C. Geosynthetic Research Institute (GRI)
 - 1. GRI-GG2-87 - Standard Test Method for Geogrid Junction Strength

1.03 DEFINITIONS

- A. Geogrid - A biaxial polymeric grid formed by a regular network of integrally connected tensile elements with apertures of sufficient size to allow interlocking with surrounding soil, rock, or earth to function primarily as reinforcement.

1.04 SUBMITTALS

- A. Product data.
- B. Samples.
- C. Quality Control Submittals:
 - 1. Certificates of Compliance.
 - 2. Manufacturer's Installation Instructions.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Storage and Protection

1. Prevent excessive mud, wet concrete, epoxy, or other deleterious materials from coming in contact with and affixing to the geogrid materials.
2. Store at temperatures above -20 degrees F (-29 degrees C).
3. Rolled materials may be laid flat or stood on end.
4. Geogrid materials should not be left directly exposed to sunlight for a period longer than the period recommended by the manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. One of the Following or Equal:

1. Tensar BX1200

2.02 MATERIAL REQUIREMENTS

A. Structural Soil Reinforcement Geogrid – The geogrid shall be integrally formed and deployed as a single layer having the following characteristics

Property ⁽¹⁾	Test Method	Requirements ⁽¹⁾
Aperture Stability Modulus at 20 cm-kg (2.0 m-N)	Kinney (2001)	.65 m-N/deg
Rib Shape	Observation	Rectangular or Square
Rib Thickness	Callipered	0.05 in.
Nominal Aperture Size	I.D. Callipered	1.0 to 1.5 in
Junction Efficiency	GRI-GG2-87	93%
Flexural Rigidity	ASTM D1388-96	750,000 mg-cm
Minimum True Initial Modulus In Use	ASTM D6637-01	
-Machine Direction (MD)		27,420 lb/ft
-Cross Machine Direction (CMD)		44,550 lb/ft

(1) Minimum average roll values unless a range or characteristic is indicated.

B. Alternate Structural Soil Reinforcement Materials – Alternate structural soil reinforcement materials will be considered in accordance with the following conditions:

1. Geotextile materials shall not be considered as an alternate to geogrid materials for subgrade improvement or base/sub-base reinforcement applications. A geotextile may be used in the cross-section to provide separation, filtration, or drainage; however, no structural contribution shall be attributed to the geotextile.
2. Alternate geogrid materials shall not be used unless approved by the ENGINEER.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verification of Conditions: Verify that conditions are satisfactory for the installation of geogrid.

3.02 PREPARATION

- A. Surface Preparation: During grading operations, take care not to disturb the subgrade. This may require use of lightweight dozers for low strength soils such as saturated, cohesionless, or low cohesion soils.
- B. Prior to Placement of Fabric: Prepare surface to smooth condition free of debris, depressions, or obstructions that may damage the geogrid.

3.03 INSTALLATION

- A. The geogrid shall be laid at the proper elevation and alignment as shown on the DRAWINGS.
- B. The geogrid shall be installed in accordance with the installation guidelines provided by the manufacturer or as directed by the ENGINEER.
- C. The geogrid may be temporarily secured in place with ties, staples, pins, sand bags or backfill as required by fill properties, fill placement procedures or weather conditions or as directed by the ENGINEER.

3.04 GRANULAR FILL PLACEMENT OVER GEOGRID

- A. Granular fill material shall be placed in lifts and compacted as directed per the Contract Documents. Granular fill material shall be placed, spread, and compacted in such a manner that minimizes the development of wrinkles in the geogrid and/or movement of the geogrid.
- B. A minimum loose fill thickness of 6 inches is required prior to operation of tracked vehicles over the geogrid. Turning of tracked vehicles should be kept to a minimum to prevent tracks from displacing the fill and damaging the geogrid. When underlying substrate is trafficable with minimal rutting, rubber-tired equipment may pass over the geogrid reinforcement at slow speeds (less than 10 mph) when integrally-formed geogrids are used. When woven, multi-layer, or welded-strip geogrids are used, rubber-tired equipment shall not be allowed to pass directly on the geogrid. Sudden braking and sharp turning movements shall be avoided.

3.05 FIELD QUALITY CONTROL

- A. Inspection: Before covering, the condition of the geogrid may be observed by the OWNER to determine that geogrid is not damaged. Any damaged or defective geogrid (i.e. frayed coating, separated junctions, separated layers, tears, etc.) will be repaired/replaced in accordance with Section 3.06.

3.06 REPAIR

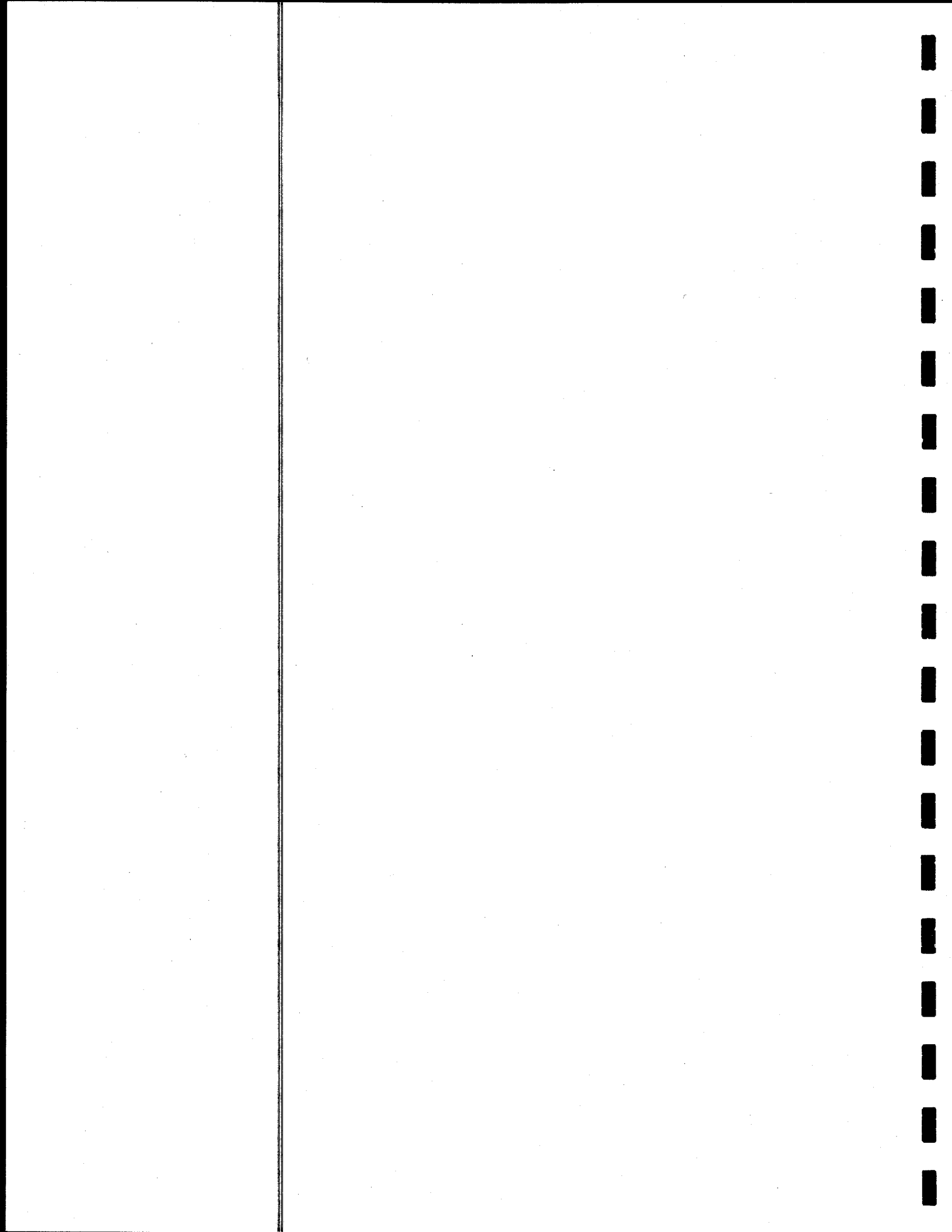
- A. Any roll of geogrid damaged before, during and after installation shall be replaced by the CONTRACTOR at no additional cost to the OWNER.
- B. Proper replacement shall consist of replacing the affected area adding 3ft (1m) of geogrid to either side of the affected area.

3.07 PROTECTION

- A. Follow the Manufacturer's recommendations regarding protection from exposure to sunlight.

END OF SECTION

**COACHELLA VALLEY WATER DISTRICT
STANDARD SPECIFICATIONS AND DRAWINGS
FOR THE
CONSTRUCTION OF DOMESTIC WATER SYSTEMS**



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OCTOBER 2005

COACHELLA VALLEY WATER DISTRICT
STANDARD SPECIFICATIONS FOR CONSTRUCTION OF
DOMESTIC WATER SYSTEMS

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COACHELLA VALLEY WATER DISTRICT

STANDARD SPECIFICATIONS FOR CONSTRUCTION OF
DOMESTIC WATER SYSTEMS

PART I - INTRODUCTION

Construction of domestic water pipelines and appurtenances subject to inspection and approval by the Coachella Valley Water District shall be in accordance with the requirements of the District's Standard Specifications for the Construction of Domestic Water Systems hereinafter referred to as Standard Specifications. Items not specifically referred to herein shall comply with the latest edition of the Standards of the American Water Works Association and/or Greenbook Standard Specifications and shall be subject to approval by the District. Construction methods, material and disposal of products shall also be subject to current standards established by South Coast Air Quality Management District, Regional Water Quality Control Board and any other local, state or federal agencies having authority in their respective jurisdiction.

The Standard Specifications include the following:

1. PART II - TECHNICAL CONDITIONS.
2. The latest edition of the "Standard Specifications for Public Works Construction" (SSPWC) written and promulgated by the Southern California Chapter of the American Public Works Association and the Southern California Districts of the Associated General Contractors of America, complete with latest supplements thereto except as modified in PART III, AMENDMENTS TO THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, and/or as modified or supplemented by PART II, TECHNICAL CONDITIONS.
3. PART III, AMENDMENTS TO THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION.
4. Coachella Valley Water District detail drawings as follows:

<u>Drawing No.</u>	<u>Title</u>
W-1	Separation and Construction Requirements for Sewer and Water Lines (Parallel Construction)
W-2	Separation and Construction Requirements for Sewer and Water Lines (Crossings)
W-3	Trench Backfill Details
W-4	Typical Main Crossing at Stormwater Channel
W-5	General Location Service and Meter Installation
W-6	Detail of Service Connection to Main-Steel and Ductile Iron Pipe
W-7A	Detail of 1" Service Installation-Meter Above Main
W-7B	Detail of 1" Service Installation-Meter behind Sidewalk
W-8	Detail of 1" Service Installation-Meter Below Main
W-9A	Detail of 1½" Service Installation-Meter Above Main
W-9B	Detail of 1½" Service Installation-Meter behind Sidewalk
W-10	Detail of 1½" Service Installation-Meter Below Main
W-11A	Detail of 2" Service Installation-Meter Above Main

Drawing No.

Title

W-11B	Detail of 2" Service Installation-Meter behind Sidewalk
W-12	Detail of 2" Service Installation-Meter Below Main
W-13A	Detail of Steel Meter Manifold Assembly
W-13B	Detail of Ductile Iron Meter Manifold Assembly
W-14	Dimensions for Fabricated Steel Fittings
W-15A	Detail of Dry Barrel Type Fire Hydrant Installation Adjacent to Sidewalk or Curb for CML/CMC Steel Pipe
W-15B	Detail of Dry Barrel Type Fire Hydrant Installation Adjacent to Sidewalk or Curb for Ductile Iron Pipe
W-16A	Detail of Dry Barrel Type Fire Hydrant Installation Unimproved Street for CML/CMC Steel Pipe
W-16B	Detail of Dry Barrel Type Fire Hydrant Installation Unimproved Street for Ductile Iron Pipe
W-17A	Detail of Valve Operator Well Installation
W-17B	Detail of Domestic Water Blowoff Well Installation
W-18A	Detail of Valve Operator Well Cap
W-18B	Detail of Domestic Water Blowoff Well Cap and Frame
W-19	Detail of Concrete Thrust Blocks
W-20	Thrust Block Bearing Areas
W-21A	Detail of 1" Air and Vacuum Relief Valve Installation
W-21B	Detail of 2" Air and Vacuum Relief Valve Installation
W-22A	Detail of 1" and 2" Valve Enclosure Locations
W-22B	Detail of 1" and 2" Valve Enclosure Locations
W-23	Detail of 4" and 6" Blowoff Assembly Installation Blowoff to Street
W-24	Not Used
W-25A	Detail of 4", 6" or 8" Blowoff Assembly Installation Blowoff to Channel for CML/CMC Steel Pipe
W-25B	Detail of 4", 6" or 8" Blowoff Assembly Installation Blowoff to Channel for Ductile Iron Pipe
W-26	Detail of Slope Protection
W-27	Detail of Standard Carsonite Marker Post for Domestic Water
W-28	Detail of Pipe Cleaning Tool (Mandrel)
W-29	Detail of Strapping for Steel Pipe
W-30A	Detail of 4" or 6" Detector Check with Bypass Meter Installation for CML/CMC Steel Pipe
W-30B	Detail of 4" or 6" Detector Check with Bypass Meter Installation for Ductile Iron Pipe
W-31A	Detail of Detector Check with Bypass Meter Installation for CML/CMC Steel Pipe
W-31B	Detail of 8" Detector Check with Bypass Meter Installation for Ductile Iron Pipe
W-32	Temporary Bacteria Sample Riser Detail
W-33A	Detail of Wet Barrel Type Fire Hydrant Installation-Adjacent to Sidewalks or Curb for Ductile Iron Pipe
W-33B	Detail of Wet Barrel Type Fire Hydrant Installation-Adjacent to Sidewalks or Curb for CML/CMC Steel Pipe
W-34A	Detail of Wet Barrel Type Fire Hydrant Installation-Unimproved Street for Ductile Iron Pipe

<u>Drawing No.</u>	<u>Title</u>
W-34B	Detail of Wet Barrel Type Fire Hydrant Installation-Unimproved Street for Ductile Iron Pipe for CML/CMC Steel Pipe
W-35	Detail of Steel Pipe Bond Clip
W-36	Detail of Cathodic Protection Test Station - Improved Areas
W-37	Detail of Cathodic Protection Test Station - Unimproved Areas
W-38A	Detail of 10" Detector Check with Bypass Meter Installation for CML/CMC Steel Pipe
W-38B	Detail of 10" Detector Check with Bypass Meter Installation for Ductile Iron Pipe
W-39	Typical Detail of Individual ¾-inch Pressure Reducing Valve Installation
W-40	Standard Casing for Domestic Water Mains
W-41	Inlet for Blow-off Water at Well Sites (Gravity Flow Only)
W-42	Bacteriological Sample Station Detail
W-43	Well Site Gates and Details
W-44	Standard Pipe Gate Assembly
W-45	Detail of Domestic Water Beeproof Meter Reading Lid

These Standard Specifications are for the purpose of defining the requirements for construction and as such do not constitute a definition of the contractual arrangement between Subdivider, Contractor and the District. Therefore, references to measurements and payment and other contractual, nontechnical requirements are not binding on the parties unless specifically referenced.

COACHELLA VALLEY WATER DISTRICT
STANDARD SPECIFICATIONS FOR CONSTRUCTION OF
DOMESTIC WATER SYSTEMS

PART II - TECHNICAL CONDITIONS

TC-1 ENCROACHMENT PERMITS

If required, encroachment permits for the construction of the domestic water system shall be obtained from the appropriate governmental agency, by the Developer or Contractor at the Developer's or Contractor's expense, prior to construction. In the event of conflict between the requirements of these Specifications and the requirements of the permits, the requirements of the permits shall govern.

TC-2 PIPING AND APPURTENANCES

2.1 Scope

This Article covers furnishing all materials and equipment performing all operations necessary to detail, furnish, fabricate and install domestic water pipelines. All mainline pipe will be ductile iron pipe. Details and specifications pertaining to appurtenances are found in subsequent sections of the standard specifications. Details for flushing and pressure testing are found in TC-8 of this specification.

2.2 Materials

2.2.1 Ductile Iron Pipe

Ductile iron pipe (DIP) and fittings shall be manufactured in accordance with AWWA C110, C111, C150, C151 and C153. DIP shall be minimum pressure Class 350 for pipe diameters 12-inch and smaller, Class 250 for 18-inch and Class 200 for 24-inch and larger, unless indicated differently on the plans. The minimum laying lengths for DIP shall be 18-feet. Gray-iron or cast-iron pipe or fittings shall not be used.

2.2.1.1 Pipe Joints

Joints for DIP shall be rubber gasket "Tyton" push-on joints, unless indicated differently in the plans.

2.2.1.2 Mechanical Thrust Devices

Refer to TC-6 for mechanical thrust devices.

2.2.2 Fittings

Fittings for DIP shall be ductile iron in accordance with AWWA C110 and C153 with cement mortar linings. Fittings that connect directly to valves shall be furnished with flanges. Fittings will be equipped with "Tyton" push-on or mechanical joints in accordance with AWWA C153 or with flanged joints will be furnished for connection to valves and steel pipe and "Tyton" push-on or mechanical joints for connection to ductile iron pipe. Fittings shall have a pressure rating equal to or greater than adjacent piping unless stated differently on the plans.

2.2.3 Polyethylene Encasement

Polyethylene encasement shall be used for all ferrous pipes, valves and fittings in areas of corrosive soils and/or where the electroconductivity of the soil is less than 1,000 Ohms per cubic centimeter, see Section 2.2.3.2, or as directed by the District.

2.2.3.1 Polyethylene Materials

Polyethylene sleeves shall be a minimum of 8 mil (0.008 inches) thick in accordance with AWWA 105.

2.2.3.2 Areas Requiring Polyethylene Encasement

2.2.3.2.1 Any underground pipeline construction in corrosive soils shall be protected with polyethylene encasement. Polyethylene encasement will be provided for the pipe and its fittings, valves, services and appurtenances. Corrosive soils are soils that can be identified by a combination of factors including, but not limited to, soil temperature, pH and/or having an electroconductivity of less than 1,000 ohms per cubic centimeter. Areas of corrosive soils include that area south and/or east of the Coachella Canal, south of Highway 111 and east of Washington Street or as specified in plans or specifications.

2.2.3 Installation of Polyethylene Encasement

When loose polyethylene encasement for the protection of DIP and its fittings, valves, services and appurtenances is required, it shall be furnished and installed in accordance with AWWA C105. Polyethylene encasement shall be the tube type and shall be installed in accordance with Installation Method A. Services tapped into DIP shall be installed in accordance with Installation Method No. 1 with polyethylene adhesive tape per TC-3, SERVICES. Polyethylene sleeves shall be secured with polyethylene or vinyl adhesive tape or plastic tie straps at the ends and quarter points along the sleeve in a manner that will hold the sleeve in place during backfill. Factory polyethylene coated copper tubing may be used in lieu of polyethylene sleeved copper tubing.

Fittings such as tees, bends and reducers shall be encased with polyethylene wrap in accordance with AWWA 105.

Valves shall have only the stem and operating nut exposed and the wrap shall be attached so that valve operation will not disturb the wrapping or break the seal.

2.2.4 Installation of Pipe

Installation of pipeline shall be per the latest edition of the "Standard Specification or Public Works Construction" (SSPWC) unless supplemented by this specification.

2.2.5 Pipe Trench Area and Operations

2.2.5.1 Pipe Bedding and Cover

Installation of ductile iron pipe, selection of pipe pressure class, construction of the pipe zone and backfill over the pipe shall be in accordance with AWWA C600 and AWWA C-151. Pipe shall have a minimum cover of 36 inches. If field conditions will not allow 36 inches cover, the contractor shall proceed only after proposing a method of strengthening the pipe zone and subject to the approval from the Engineer. All pipe larger than 12 inches shall be placed in the trench according to standard laying conditions Type 2, 3, 4 or 5 (AWWA C151). Type 1 laying condition may be used for 12-inch pipe and smaller.

Any excavation carried down below the grades shown on the plans or in excess of those ordered by the Engineer shall be refilled in layers and compacted to 90 percent relative compaction or Class 470-B-2000 concrete. Such work will be done entirely at Contractor's expense.

2.2.5.2 Dewatering

The Contractor shall provide and maintain at all times during construction ample means and devices to promptly remove and dispose of all water from any source entering trench excavations or other parts of the work. Any damage or altered pipeline appurtenances or trench shall be the Contractor's responsibility.

Dewatering shall be performed by methods that will maintain a dry excavation, preservation of the final lines and grades and protect all utilities. If flooding of the trench does occur, the Contractor shall immediately dewater and restore the trench. Damage or altered pipeline appurtenances or trench materials shall be repaired as directed by the Engineer.

The trench and other excavation shall be kept entirely free of water while concrete or pipe is being placed and until all concrete or mortar has been set hard.

Water will be disposed in such a manner as will not cause injury to public or private property, nor be a menace to the public.

Other methods of water control, other than dewatering, shall be subject to the approval of the Engineer.

2.3 Installation of Test Plates

All hot taps or connections to active domestic water mains, including construction of stub-outs, will be performed by District forces. Connections to existing closed valves or isolated sections of pipe are permissible under direct District inspection and approval by a District Engineer or Inspector. During construction and prior to the pressure test, all valves will be equipped with a test plate, which will be provided by the Contractor. The Contractor will only be allowed to perform a pressure test on a water line when all valves adjacent to active water lines are protected with a test plate. The Contractor shall remove the test plates after the pressure test has been accepted. If the pressure test is performed with chlorinated water, the Contractor shall remove the test plate from all active valves and chlorinated water shall remain in the system for a minimum of 24 hours before the system is flushed.

2.4 Valve locks

The Contractor shall install a valve-locking device on all valves at District stub-outs or where a valve connects directly to an active line. The locking device shall be provided by the Contractor. District forces will install the locking device and return it to the Contractor after the new water line has been progressed for service.

TC-3 SERVICES

3.1 Scope

This Article covers furnishing all materials and equipment and performing all operations necessary to detail, furnish, fabricate, install, and test the services.

3.2 Materials

3.2.1 Copper Tube

Copper tube shall conform with ASTM B 88, Type K; ASA H23-1 or Federal Specification WW-T-799A. Copper tube shall be used for 1, 1½, and 2-inch service lines. Copper tube in the 1½ and 2-inch size shall be furnished in 20 foot straight lengths, not coils.

3.2.2 Corporation Stops

Corporation stops shall be brass body, Teflon coated brass ball type, full way bore, with the inlet for outside iron pipe thread, and compression type outlet for a copper tube service line.

3.2.3 Meter Stops

3.2.3.1 1-inch

Meter stops for 1-inch services shall be brass body, Teflon coated brass ball type angle meter stop, full way bore, with lockwing. Inlet shall be compression type for copper tube and the outlet for threaded meter coupling.

3.2.3.2 1½ and 2-inch

Meter stops for 1½ and 2-inch services shall be brass body, Teflon coated brass ball type angle meter stop, full way bore, with lockwing. Inlet shall be compression type for copper tube and outlet for flanged meter connections.

3.2.4 Ball Valves

Ball valves 2 inches and smaller shall be bronze, Class 200, and shall have inside iron pipe threads.

3.2.5 Fittings

Fittings shall be the compression type with all bronze or brass parts and shall comply with ASA B16-26.

3.2.6 Straight Couplings

Straight couplings shall be brass with outside iron pipe thread outlet for 1-inch and compression or sweat type for 1½ and 2-inch copper type.

3.2.7 Corporation Stop Couplings

Corporation stop couplings shall be brass, 90° bend with the inlet for copper coupling thread and compression type outlet for copper tube.

3.2.8 Meter Manifold

3.2.8.1 Steel

Steel pipe meter manifolds shall be constructed of mill type steel pipe in accordance with Detail Drawing No. W-13A.

3.2.8.2 Ductile Iron

Ductile iron meter manifolds shall be constructed of Class 350 ductile iron pipe in accordance with Detail Drawing No. W-13B.

3.2.9 Meter Boxes

Meter boxes shall be polymer construction manufactured by Armorcast Brooks Concrete Products, J & R, H & C, C.D.R. and/or approved equal and interchangeable with the following:

	<u>Concrete</u>	<u>Polymer</u>
1-inch services	Brook Concrete Products No. 33	J&R #P4-0 CDR #WA03-1119-12E
1½-inch and 2-inch services	Brook Concrete Products No. 66	J&R #W6-B (Box) Armorcast #A600178X12 (Cover) #A6001643D (Lid) #A6000482

When installed in nontraffic locations, the meter box shall be equipped with a two-piece precast cover and lid. The meter reading lid shall be beeproof in accordance with Detail Drawing No. W-45. When installed in a traffic area adjacent to pavement, or in a commercial or industrial area, the meter box shall be sized for 1½-inch service and be equipped with a 3/8-inch plate steel traffic cover or a polymer box and cover with an T-20 rating.

3.2.10 Silver Solder

Silver solder for sweat joints on copper tube shall be minimum 15 percent silver and 85 percent tin. Solder shall not contain lead or zinc. Flux will not be allowed.

3.2.11 Service Saddles

Service saddles for pipes 12 inches and smaller shall be double strapped with bronze body. Service saddles for pipes 18-inch and larger shall be triple strapped stainless steel with ductile iron saddle body or approved equal.

3.3 General

Unless otherwise approved by the Engineer, only single service installations will be permitted.

3.4 Sizes

Service size shall be in accordance with the following:

<u>Meter</u>	<u>Service Line & Fittings</u>
¾-inch	1-inch
1-inch	1½-inch
1½-inch	2-inch
2-inch	2-inch

3.5 Installation

3.5.1 General

Only complete service installations, including but not limited to corporation stop, service line, meter stop and meter box, will be permitted.

3.5.2 Existing Mains In Service

Service connections to existing mains in service will be made by the District.

3.5.3 Service Taps

3.5.3.1 General

Service taps to mains shall not be closer than 24 inches apart.

3.5.3.2 Steel Mains

Service taps shall be made with a weld-on coupling welded to the pipe in accordance with Detail Drawing No. W-6. No service or other tap shall be made in a steel main closer than 18 inches to a bell, joint or coupling.

The opening through the steel pipe cylinder and the cement mortar lining shall be drilled to the maximum diameter allowed by the intended corporation stop.

Weld-on couplings shall be ¼-inch larger in diameter than the intended 1-inch service and ½-inch larger in diameter than the intended 1½-inch or 2-inch service.

Services shall be insulated from the steel water main by installing a nylon, or equal, bushing between the corporation stop and weld-on coupling.

After installation of the weld-on coupling, bushing, and corporation stop, the exterior cement mortar coating of the main shall be repaired and the weld-on coupling coated in accordance with Article TC-10, FIELD APPLICATION OF PROTECTIVE COATINGS.

3.5.3.3 Ductile Iron Mains

Service lines shall be either direct tapped or fastened to the pipe with a service saddle. Tap size or saddle application shall be determined from AWWA C-151, Table A. When direct tap method is used, the corporation stop shall be installed according to Detail Drawing No. W-6. The corporation stop shall fully penetrate the pipe wall to assure maximum thread contact.

3.5.4 Service Lines

3.5.4.1 General

Service lines shall be constructed in accordance with the Detail Drawings. One-inch copper service lines shall consist of one continuous piece of tube between corporation stop and meter stop. These lines shall be cut of sufficient lengths to allow the pipe to be "snaked" in the trench and to provide a "gooseneck" or bend at the connection of the corporation stop. Special compaction care shall be given to the portion of the service line close to the corporation stop. Service lines shall be terminated with the meter stop within the meter box in a manner to facilitate the easy installation of the meter.

3.5.4.2 Corrosive Soils

Service lines shall be polyethylene encased for external corrosion protection of the entire service line assembly in accordance with these specifications. Polyethylene encasement shall be the tube type and shall be installed in accordance with AWWA C105 installation Method A.

3.5.5 Meters

Meters will be installed by the District at the Contractor's or Developer's expense.

3.5.6 Meter Boxes

3.5.6.1 General

Meter boxes shall be installed where shown on the Plans. They shall be set true to line and grade and shall be flush with the sidewalk or concrete curb. Where no concrete curbs are installed, the meter box shall be located in accordance with Detail Drawing No. W-5, or as directed by the Engineer.

3.5.6.2 Adjacent to Curb or Sidewalk

Meter boxes shall not be installed until after the concrete curb is completed and/or the sidewalk area is graded, except where concrete curbs are not to be installed.

3.5.6.3 In Sidewalks or Pavement

Meter boxes shall be installed in sidewalks or pavement only where specified by the Engineer.

Meter boxes, when installed in either sidewalks or paved areas, shall be no closer than 3 inches from the edge of either the concrete sidewalk or pavement. The top of the traffic cover shall be flush with the surface of the concrete or pavement. Meter boxes placed in a traffic area shall have T-20 rating.

3.5.7 Meter Manifolds

3.5.7.1 Fabrication

3.5.7.1.1 General

Meter manifolds shall be fabricated in accordance with Detail Drawing Nos. W-13A or W-13B. The ends of the steel manifold shall be welded closed with 3/8-inch steel plate. The end of the ductile iron manifold shall be plugged utilizing a "Tyton" joint restraining gasket as specified in TC-5, THRUST DEVICES, or Engineer approved equal.

3.5.7.1.2 Weld-on Couplings for Steel

The size and installation of the weld-on couplings shall conform with Subparagraph 2.5.3.3, except that the weld-on couplings shall be installed on the manifold in accordance with Detail Drawing No. W-13A.

When exact service size has not been determined at the time of fabrication of the manifold or if the manifold is to be installed in a commercial or industrial area, 2½ inch weld-on couplings shall be installed and then bushed, if necessary, at the time of the installation of the service.

3.5.7.1.3 Coating and Lining

Steel meter manifolds shall be coated and lined in accordance with Article TC-10, FIELD APPLICATION OF PROTECTIVE COATINGS.

3.5.7.2 Installation

Meter manifolds shall be installed in accordance with Detail Drawing Nos. W-13A or W-13B. The location of the service and/or meter shall be in accordance with this Article TC-2, SERVICES.

3.5.8 Excavation, Bedding and Backfill

Excavation, bedding and backfill for buried pipe shall be in accordance with these Specifications.

3.6 Field Tests

After completion of the installation of the service and before acceptance thereof, the Contractor shall perform such tests as may be necessary to assure proper functioning of all components. Defects disclosed by such testing shall be repaired to the satisfaction of the Engineer by and at the expense of the Contractor. Service installations shall be subject to pressure testing, flushing and chlorination in accordance with these Specifications.

TC-4 FIRE HYDRANT ASSEMBLIES

4.1 Scope

This Article covers furnishing all materials and equipment and performing all operations necessary to detail, furnish, fabricate, install and test the fire hydrant assemblies.

Fire hydrant assemblies shall consist of, but not be limited to the following: the connection to the main, hydrant, bury (riser), gate valve, break off check valve, valve operator well, hydrant run, thrust devices, and appurtenances.

4.2 Materials

4.2.1 Fire Hydrant

4.2.1.1 General

Fire hydrants shall be equipped with a 6-inch bottom connection, two 2½-inch National Standard hose connections and one 4-inch National Standard hose pumper connection, dry or wet barrel type, as specified by these Specifications. Only balata or rubber seat type valves in hydrants shall be permitted. Hydrants shall open counterclockwise.

4.2.1.2 Joints

The complete fire hydrant assembly shall have flanged type joints, except the bottom run connection shall either be flanged, "Tyton" joint with an approved restraining gasket, or mechanical joint with an approved restraining gland to connect to the type of hydrant run specified on the Plans by these Specifications.

4.2.1.3 Dry Barrel

Fire hydrants of the dry barrel type shall conform to AWWA C502 and shall be equipped with a 5¼-inch valve opening. Drain outlets shall be plugged in a satisfactory manner; self tapping pipe repair plugs or other similar devices shall not be used for this purpose.

4.2.1.4 Wet Barrel

Fire hydrants of the wet barrel type shall conform to AWWA C503 and shall be of all bronze construction including hose caps and chain. Fire hydrants shall be equipped with Schedule 40 or Class 50 ductile iron 6-inch risers and positive break off check valve assemblies.

Hydrant base flange shall be 6-hole drilled to match break off check valve assembly top. Hydrant 6-inch riser flange shall be 8-hole drilled to match break off check valve assembly base.

4.2.1.4.1 Check Valves

Positive break off check valve assemblies shall be installed on all wet barrel type hydrants and shall be epoxy lined in accordance with these Specifications. Check valve assemblies shall be 6-hole drilled to match fire hydrant base and 8-hole drilled to match hydrant riser.

A 1/8-inch witness leak hole shall be provided in the check valve clapper to provide, upon closure, a visible stream of water to attract attention to the broken hydrant.

4.2.1.5 Manufacturers

4.2.1.5.1 Dry Barrel

Dry Barrel fire hydrants shall be accepted only when made by one of the following manufacturers: Mueller Model A423, Kennedy Model K-81A, Clow Model F-2545 and American Darling Model B-84-B or approved equal.

4.2.1.5.2 Wet Barrel

Wet barrel fire hydrants shall be accepted only when made by one of the following manufacturers: ~~Long Beach Iron Works Model B 130~~, James Jones Company Model J-3765 and Clow Model 2060 or approved equal.

4.2.1.5.3 Check Valves

Positive break off check valve assemblies shall accepted only when made by one of the following manufacturers: Long Beach Iron Works Model LB400 and Clow Model No. 40.

4.2.2 Hydrant Runs

4.2.2.1 Non-Corrosive Soils

4.2.2.1.1 Under 40 Feet in Length

Hydrant runs in non-corrosive soils, and under 40 feet in length shall consist of either a continuous length of 6-inch CML/CMC steel pipe without joints; "Tyton" joint ductile iron pipe with approved restraining gaskets at joints; or mechanical joint ductile iron pipe with approved restraining glands at joints in accordance with these Specifications.

4.2.2.1.2 40 Feet in Length and Greater

Hydrant runs in non-corrosive soils and 40 feet in length or greater shall consist of either 6-inch CML/CMC steel pipe with flanged joints; "Tyton" joint ductile iron pipe with approved restraining gaskets at joints; or mechanical joint ductile iron pipe with approved restraining glands at joints in accordance with these Specifications.

4.2.2.2 Corrosive Soils

Hydrant runs in corrosive soils shall consist of either 6-inch "Tyton" joint ductile iron pipe with approved restraining gaskets at joints or 6-inch mechanical joint ductile iron pipe with approved restraining glands at joints. CML/CMC hydrant runs shall only be installed as specified on the Plans or as directed by the Engineer. Hydrant runs shall be polyethylene encased for external corrosion protection of the entire assembly in accordance with these Specifications.

4.2.3 Appurtenances

Fittings, gate valves, valve operator wells, thrust devices, and appurtenances shall be in accordance with these Specifications.

4.3 Installation

4.3.1 General

Fire hydrant assemblies shall be installed in accordance with Detail Drawing Nos. W-15A and B, W-16A and B, W-33A and B, and W-34A and B.

4.3.2 Location

Dry barrel type fire hydrants shall be located and installed in accordance with Detail Drawing Nos. W-15A and B and W-16A and B and as shown on the Plans. Dry barrel type hydrants shall only be used in residential areas or as specified by the Engineer.

Wet barrel type fire hydrants shall be located and installed in accordance with Detail Drawing Nos. W-33A and B and W-34A and B and as shown on the Plans. Wet barrel type hydrants shall be used in commercial and industrial areas and may be used in residential areas or as specified by the Engineer.

All fire hydrants shall stand plumb with the pumper nozzle facing the curb. Where curbs are not installed, the pumper nozzle shall face the street.

4.3.3 Excavation, Bedding and Backfill

Excavation, bedding and backfill for buried pipe required in the fire hydrant assemblies shall be in accordance with these Specifications.

4.4 Field Tests

After completion of the installation of the fire hydrant assembly and before acceptance thereof, the Contractor shall perform such tests as may be necessary to assure proper functioning of all components. All defects disclosed by such testing shall be repaired to the satisfaction of the Engineer by and at the expense of the Contractor. Fire hydrant assemblies shall be subject to pressure testing, flushing, and chlorination in accordance with these Specifications.

4.5 Coatings and Linings

Protective coatings and linings shall be provided in accordance with this Article TC-10, FIELD APPLICATION OF PROTECTIVE COATINGS. Each fire hydrant barrel, bury and extension shall be painted and marked in accordance with AWWA C502 or C503; the exterior portion above the ground shall be painted caterpillar yellow and the hydrant bonnet (dry barrel type) or top (wet barrel type) shall be painted OSHA green.

4.6 Hydrant Pavement Markers

4.6.1 General

Blue hydrant pavement markers shall be placed on all thoroughfares to mark hydrant locations. Markers shall be placed directly opposite each hydrant approximately three inches from the centerline of the street on the side of the street nearest the hydrant.

4.6.2 Manufacturers

Markers shall be Stimsonite Model 9-11SSAB or approved equal. Equal markers shall be approved by the Riverside County Fire Marshall.

4.6.3 Installation

Markers shall be installed in accordance with manufacturer's recommendations.

TC-5 VALVES AND VALVE OPERATOR WELLS

5.1 Scope

This Article covers furnishing all materials and equipment and performing all operations necessary to furnish, install and test the valves and valve operator wells.

5.2 Materials

5.2.1 General

Valves 3 to 12 inches in diameter shall be gate valves. Valves larger than 12 inches in diameter shall be butterfly valves. Valves smaller than 3 inches in diameter shall be in accordance with Article TC-2, SERVICES. Valves shall open counterclockwise.

5.2.2 Valves

5.2.2.1 Gate Valves

Gate valves shall be of the resilient wedge type in accordance with AWWA C509. Valve bodies shall be made of ductile iron. Gate valves shall be provided with "O" ring stem seals, fully rubber encapsulated wedges, minimum 8.0 mil fusion bonded epoxy coating inside and outside, full size unobstructed flow way and low zinc bronze non-rising stems.

5.2.2.2 Butterfly Valves

Butterfly valves shall be in accordance with AWWA C504 for buried services. Valve bodies shall be made of ductile iron. Butterfly valves shall be provided with "O" ring or chevron packing for shaft seals. Butterfly valves shall be Class 150B of the short-body flanged configuration, minimum 8.0 mil fusion bonded epoxy coating inside and outside. Butterfly valves shall be equipped with manual operators with an operator nut. The dimension of the operator nut shall be in accordance with AWWA C500. Butterfly valves shall be "seat on body" construction.

5.2.2.3 Manufacturers

Resilient wedge gate valves shall be accepted only when made by one of the following manufactures: American AVK, Clow, M & H, Stockham, and U.S. Pipe.

Butterfly valves shall be accepted only when made by one of the following manufacturers: Mueller, Pratt, Kennedy, ~~M & H,~~ and ~~Keystone.~~

5.2.3 Valve Operator Wells

Valve operator wells for valves shall consist of 8-inch diameter, C-900 PVC pipe, as shown on Detail Drawing No. W-17A. Valve operator wells shall be equipped with a cast iron frame with cap, South Bay Foundry, No. SBF-1208-G or approved equal, marked "CVWD WATER," as shown on Detail Drawing No. W-18.

5.3 Installation

5.3.1 Valves

Valves shall be installed in accordance with manufacturer's recommendations and these Specifications. Thrust devices shall be installed in accordance with Article TC-5, THRUST DEVICES.

5.3.2 Valve Operator Wells

Valve operator wells shall be installed in accordance with Detail Drawing No. W-17. The caps and upper valve operator well sections shall be placed after the surrounding street surface has been laid.

5.3.3 Valve Operator Nut Extensions

Valve operator nut extensions shall be installed where necessary to maintain the depth below finish grade to the operator nut to no more than four feet. The design of the extension shall be such to ensure the centering of the operator nut within the valve operator well.

5.4 Coatings and Linings

Valve operator wells shall be 8-inch at 900 PVC. The caps shall be painted Caterpillar yellow.

TC-6 THRUST DEVICES

6.1 Scope

This Article covers furnishing all materials and equipment and performing all operations necessary to detail, furnish, fabricate, construct, and install thrust devices.

6.2 Basic Requirements

The Contractor shall construct thrust devices as and where directed by the Engineer, as shown on the Plans and/or as required by these Specifications.

6.3 Materials

6.3.1 Concrete Thrust Blocks

Concrete thrust blocks shall be constructed of 420-B-2000 concrete.

6.3.1.1 Concrete shall not be poured directly against pipe, fitting or valve. A sheet of polyethylene wrap shall be placed against the pipe to serve as a bond-breaker. The polyethylene wrap shall have a minimum thickness of 8.0 mil.

6.3.1.2 Where reinforcing bars are used in the construction of the thrust block, bare metal of the reinforcing rods shall not be exposed directly to the soil and/or elements. Reinforcing bars shall be protected from the elements with one or more of the following; cement coating, poly-wrap, 10 mil pipe wrapping tape or factory applied epoxy coating. In corrosive soils, additional protection will be required and subject to the approval of the Engineer.

6.3.2 Mechanical Thrust Devices for Ductile Iron Pipe

Mechanical thrust restraining devices for "Tyton" and mechanical joint ductile iron pipe shall be installed in addition to concrete thrust blocks as required by these Specifications.

6.3.2.1 Manufacturers

6.3.2.1.1 "Tyton Joint"

Mechanical thrust restraining devices for "Tyton" joint ductile iron pipe shall be "Field Lok" restraining gaskets as manufactured by U.S. Pipe, or Engineer approved equal.

6.3.2.1.2 Mechanical Joint

Mechanical thrust restraining devices for mechanical joint ductile iron pipe shall be "Mega Lug" restraining glands as manufactured by E.B.A.A. Iron Works with ductile iron trim, or Engineer approved equal.

6.3.3 Other Thrust Devices

Materials for other thrust devices shall be as specified on the Plans or as directed by the Engineer.

6.4 Location

A concrete thrust device shall be provided at all valves, fittings, blowoff assemblies, meter manifolds, dead-ends, and fire hydrant assemblies. On slopes greater than 15 percent or at static pipeline pressures greater than 100 psi, thrust devices shall be installed as directed by the Engineer or as shown on the Plans.

A mechanical thrust device shall be installed at all ductile iron fire hydrant assemblies, meter manifolds and detector check assemblies and as required by these Specifications, as shown on the Plans or as directed by the Engineer.

6.5 Size

6.5.1 Concrete Thrust Blocks

Concrete thrust blocks shall be designed to have sufficient bearing area and shall be placed as to safely transmit to the surrounding earth, the maximum forces which may occur in the pipeline at that point. The minimum bearing areas of concrete thrust blocks shall be in accordance with Detail Drawing No. W-20.

The depth of concrete thrust blocks below valves shall conform with the following table and shall be full width of the trench.

<u>Size of Valve</u>	<u>Depth of Thrust Block Below Valve</u>
6-inch	6 inches
8-inch	8 inches
12-inch	12 inches
18-inch and up	As directed by Engineer

6.5.2 Other Thrust Devices

Sizes for other thrust devices shall be as specified on the Plans or as directed by the Engineer.

6.6 Installation

6.6.1 Concrete Thrust Blocks

6.6.1.1 General

Concrete thrust blocks shall be placed between fitting and trench wall or trench bottom, as may be applicable. The bearing face and bottom of a concrete thrust block shall be on undisturbed sound material. Concrete thrust blocks shall be installed in accordance with Detail Drawing No. W-19. Concrete shall be kept behind the bells or flanges of fittings and valves. Form work shall be constructed whenever necessary to confine the concrete to the prescribed dimension for the block. Form lumber shall be removed prior to testing.

6.6.1.2 Upward Thrust

At vertical bends where upward thrust will occur, concrete thrust blocks utilizing reinforcing steel bar collars shall be installed in accordance with Detail Drawing No. W-19.

6.6.1.3 Curing

Concrete thrust blocks shall be allowed to cure for at least 48 hours prior to pressure tests on the pipelines.

6.6.2 Mechanical Thrust Devices

Mechanical thrust devices shall be installed in accordance with manufacturer's instructions.

6.6.3 Other Thrust Devices

Thrust devices other than concrete thrust blocks or mechanical thrust devices shall be approved and installed as directed by the Engineer.

6.6.4 Excavation, Bedding and Backfill

Excavation, bedding and backfill for thrust devices shall be in accordance with these Specifications.

6.7 Field Tests

After completion of the installation of the thrust device and before acceptance thereof, the Contractor shall perform such tests as may be necessary to assure proper functioning of the thrust device. Defects disclosed by such testing shall be repaired to the satisfaction of the Engineer by and at the expense of the Contractor.

6.8 Coating

Exposed metal surfaces of thrust devices not otherwise protected by galvanizing or cement mortar shall be coated in accordance with Article TC-10, FIELD APPLICATION OF PROTECTIVE COATINGS.

TC-7 AIR AND VACUUM RELIEF VALVE ASSEMBLIES

7.1 Scope

This Article covers furnishing all materials and equipment, and performing all operations necessary to furnish, install and test the air and vacuum relief valve assemblies.

Air and vacuum relief valve assemblies shall consist of, but not be limited to, air and vacuum relief valve, corporation stop, service line and ball valve.

7.2 Materials

7.2.1 Air and Vacuum Relief Valves

7.2.1.1 General

The air and vacuum relief valves shall be the float actuated type.

7.2.1.2 Manufacturer and Model

Air and vacuum relief valves shall have stainless steel trim and be of the manufacturer and model of one of the following: Crispin Universal Air Valve, Model No. U110 or U120, as manufactured by the Multiplex Company, Berwich, Pennsylvania or approved equal.

7.2.2 Additional Materials

Additional materials, including but not limited to corporation stop, gate valve, service line, and meter box, shall be in accordance with Article TC-2, SERVICES.

7.3 Size

One-inch air and vacuum relief valve assemblies shall be installed on mains up through 8 inches in diameter. Two-inch air and vacuum relief valve assemblies shall be installed on mains greater than 8 inches in diameter.

7.4 Installation

7.4.1 General

Air and vacuum relief valves shall be installed at all high points on a main where indicated on the Plans, or where directed by the Engineer.

7.4.2 Connections to the Main

Connections to the main shall be made in accordance with Article TC-2, SERVICES, except that the connection shall be made at the top of the main.

7.4.3 Service Lines

The service line shall slope continuously upward from the main to the air and vacuum relief valve.

7.4.4 Air and Vacuum Relief Valves

The air and vacuum relief valves and appurtenances shall be installed in accordance with Detail Drawing Nos. W-21A, W-21B, W-22A or W-22B.

7.4.5 Cover

Covers shall be installed in accordance with Detail Drawing W-21A or W-21B.

7.4.6 Excavation, Bedding and Backfill

Excavation, bedding and backfill for air and vacuum relief valve assemblies shall be in accordance with these Specifications.

7.5 Field Tests

After completion of the installation of air and vacuum relief valve assemblies and before acceptance thereof, the Contractor shall perform such tests as may be necessary to assure proper functioning of all components. All defects disclosed by such testing shall be repaired to the satisfaction of the Engineer by and at the expense of the Contractor. Air and vacuum relief valve assemblies shall only be subject to pressure testing at normal operating line pressure and chlorination in accordance with these Specifications.

TC-8 BLOWOFF ASSEMBLIES

8.1 Scope

This Article covers furnishing all materials and equipment, and performing all operations necessary to detail, furnish, fabricate, install, and test blowoff assemblies.

8.2 Materials

Materials used in blowoff assemblies shall be in accordance with these Specifications.

8.3 Installation

8.3.1 General

Blowoff assemblies shall be installed where indicated on the Plans, or as directed by the Engineer. Thrust devices shall be installed in accordance with Article TC-5, THRUST DEVICES.

8.3.2 Vertical Blowoffs

Blowoff assemblies located in streets or other similar locations shall be installed in accordance with Detail Drawing No. W-23.

8.3.3 Horizontal Blowoffs

Blowoff assemblies located in the bank of a channel or other similar locations shall be installed in accordance with Detail Drawing Nos. W-25A and W-25B.

8.3.4 Excavation, Bedding and Backfill

Excavation, bedding and backfill for blowoff assemblies shall be in accordance with these Specifications.

8.4 Field Tests

After completion of the installation of the blowoff assembly and before acceptance thereof, the Contractor shall perform such tests as may be necessary to assure proper functioning of all components. All defects disclosed by such testing shall be repaired to the satisfaction of the Engineer by and at the expense of the Contractor.

TC-9 FLUSHING AND DISINFECTION OF MAINS AND APPURTENANCES

9.1 Scope

This Article covers furnishing all materials and equipment, and performing all operations necessary to flush and disinfect mains and appurtenances.

9.2 Flushing

Prior to disinfection, the main shall be flushed in accordance with AWWA C651 with a flushing velocity of not less than 2.5 fps and sustained for a period of time not less than twice the minimum theoretical time necessary to flush the entire length of the main. If so directed by the Engineer, portions of certain appurtenances may be required to be temporarily reconfigured for flushing purposes. In the event of possible adverse effects of flushing on system operations, flushing shall be conducted during the hours of least demand or as directed by the Engineer. The District shall not be responsible for loss or damage resulting from the flushing operation.

9.3 Disinfection

9.3.1 General

After pressure testing and flushing and prior to acceptance of the work, the entire main including all valves, fittings, fire hydrants, service lines, and other appurtenances shall be disinfected in accordance with AWWA C651, as modified below.

9.3.2 Application of Chlorine

The continuous feed method shall be used to apply the chlorine. The placing of HTH capsules, tablets or powder in pipe sections during the laying process is not acceptable.

9.3.3 Disposal of Chlorinated Water

The Contractor shall be responsible for disposing of the chlorinated water. Discharges of hydrostatic test waters shall comply with state and federal regulations governing discharges to surface water and land. These discharges shall not contain hazardous or designated waste as defined in Section 66261, Title 22, California Code of Regulations and Section 13173, California Water Code. These discharges shall not cause pollution, contamination or nuisance as defined in Section 13050, California Water Code. Control measures shall be implemented to ensure discharges to surface water do not contain residual chlorine in excess of 0.1 milligrams per liter (mg/L) and discharges to land do not contain residual chlorine in excess of 4 mg/L. The District will not be responsible for loss or damage resulting from such disposal.

9.3.4 Necessary Appurtenances

The Contractor shall install corporation stops of the proper size wherever necessary to chlorinate and dispose of any chlorinated water. Corporation stops and other necessary appurtenances and their installation shall be in accordance with Article TC-3, SERVICES.

9.3.5 Bacterial Analysis

After the chlorinated water has been flushed from the system, the District will perform a bacterial analysis on a water sample from the system. Contractor shall install temporary bacterial-sample risers in accordance with Detail Drawing No. W-32, as directed by the Engineer. After completion of bacterial analysis, temporary bacterial sample risers shall be abandoned as directed by the Engineer.

TC-10 FIELD APPLICATION OF PROTECTIVE LININGS AND COATINGS

10.1 Scope

This Article covers furnishing all materials and equipment and performing all operations necessary for field application of protective linings and coatings.

10.2 Underground Coatings

10.2.1 Cement Mortar Coatings

10.2.1.1 Materials

Cement mortar used for protective coatings shall be Class E mortar with Type V cement.

10.2.1.2 Installation

10.2.1.2.1 Steel Pipe Joints

Steel pipe joints shall be thoroughly cleaned and coated with cement mortar to a minimum thickness equal to the thickness of the cement mortar coating on the pipe. The cement mortar coating shall be retained around the steel pipe joint by utilizing an approved "diaper".

10.2.1.2.2 Repair

Repair of cement mortar coatings shall be made with mortar to a minimum thickness equal to the thickness of the cement mortar coating.

10.2.2 Polyethylene Wrap

10.2.2.1 Materials and Installation

Polyethylene wrap (poly-wrap) shall be in accordance with AWWA C105. Poly-wrap shall be installed per Method A.

10.2.3 NO-OX-ID

10.2.3.1 Materials and Application

NO-OX-ID shall be applied directly to exposed bare metal (including standard bolts) for corrosion protection and shall be applied in connection with poly-wrap where applicable.

10.2.4 Pipe Tape

10.2.4.1 Materials and Installation

10 mil pipe wrap tape may be used to protect reinforcing bars when in direct contact with the soil. Pipe wrap tape may also be used on other metal surfaces with approval from the engineer.

10.3 Interior Linings

10.3.1 Epoxy Linings

Epoxy linings shall be used for the protection of interior surfaces of potable water appurtenances and may be used for protection of exterior underground surfaces when approved by Engineer.

10.3.1.1 Materials

Epoxy linings shall be of the manufacturer and type of one of the following: 20-2000 Pota-Pox as manufactured by Tnemec Company, Inc.; Hi-Gard epoxy coating as manufactured by Koppers Company, Inc.; or Engineer approved equal. Linings shall be applied in accordance with manufacturer's recommendations.

10.3.1.2 Installation

10.3.1.2.1 Meter Manifolds

Steel meter manifolds shall be thoroughly cleaned and shall be lined with 2 part epoxy coating applied in 2 coats to a minimum dry film thickness of 14 mils in conformance with AWWA C210. Contractor shall provide access to the lined pipe for thickness and spark testing by the Engineer.

10.3.1.2.2 Others

Sleeve-type couplings and other buried metal items which are not galvanized or mortar lined shall be thoroughly cleaned and shall be coated with 2 part epoxy coating, applied in 2 coats, to a minimum dry film thickness of 14 mils.

10.3.2 Cement Mortar Linings

10.3.2.1 Materials

Cement mortar used for protective linings shall be Class E mortar with Type V cement.

10.3.2.2 Installation

10.3.2.2.1 Steel Pipe Joints

On bell and spigot steel pipe larger than 18-inch diameter, the joints shall be cement mortar lined following the assembly of the joints. The cement mortar lining shall be made to a minimum thickness equal to the thickness of the cement mortar lining on the pipe.

10.3.2.2.2 Repair

Repair of cement mortar linings shall be made with mortar to a minimum thickness equal to the thickness of the cement mortar lining on the pipe.

TC-11 CARSONITE UTILITY MARKERS

11.1 Scope

This Article covers furnishing all materials and equipment and performing all operations necessary to furnish, fabricate and install Carsonite Utility Markers.

11.2 Materials

Marker shall be Carsonite Utility Markers in accordance with Detail Drawing No. S-39.

11.3 Installation

Carsonite Utility Markers shall be installed where shown on the Plans in accordance with Detail Drawing No. W-27. Unless otherwise specified, Carsonite Utility Markers are required if valves, or air vacuum relief assemblies or blow-off assemblies are to be installed outside of paved areas, or as directed by the engineer.

11.4 Location

Carsonite Utility Markers shall be located inside the public right-of-way in such a position as to minimized the probability of damage from vehicular impact. Unless otherwise specified, Carsonite Utility Markers shall be located at the point two (2) feet inside the public right-of-way. The offset to the pipe centerline or center of manhole shall be recorded on a brass tag and affixed to the Carsonite Utility Marker. The tag shall face the pipe. If the distance to the edge of right-of-way is excessive, the marker post shall be installed as directed by the appropriate District personnel.

TC-12 SLOPE PROTECTION

12.1 Scope

This Article covers furnishing all materials and equipment and performing all operations necessary to detail and construct slope protection.

12.2 Location

12.2.1 General

Slope protection is required wherever the profile of the ground surface above the pipeline exceeds 15 percent and where no pavement or bituminous road surfacing is to be laid over the exposure of the pipe after backfill.

12.2.2 Slopes - 15 to 50 Percent

Where the profile lies between 15 percent and 50 percent, cut-off walls shall be constructed at a horizontal spacing such that the top of each wall, just below finished ground grade, shall be at an elevation not more than 36 inches below that of the bottom of the next adjacent wall uphill.

12.2.3 Slopes - More than 50 Percent

Where the profile exceeds 50 percent, cut-off walls shall be provided on a horizontal spacing of 10 feet, center to center, and surface slope protection shall be provided between walls.

12.3 Materials

12.3.1 Cut-off Walls

12.3.1.1 Reinforced Concrete

Reinforced concrete cut-off walls reinforcing steel shall be in accordance with Grade 40 billet steel of ASTM A 615.

12.3.1.2 Cement Masonry

Cement masonry cut-off walls shall be in accordance with these Specifications. Concrete blocks shall be 8x8x16 standard block. Reinforcing steel shall be in accordance with Grade 40 billet steel of ASTM A 615.

12.3.2 Surface Slope Protection

12.3.2.1 Concrete

Concrete surface slope protection shall be constructed of 420-B-2000 concrete.

12.3.2.2 Other

Other surface slope protection shall be approved by the Engineer.

12.4 Installation

12.4.1 General

Cut-off walls and surface slope protection shall be constructed in accordance with Detail Drawing No. W-26.

12.4.2 Cut-off Walls

12.4.2.1 General

Cut-off walls shall be a minimum thickness of 8 inches. The top of the wall shall be located just below finish ground grade and the bottom shall be 3 feet below ground grade or 6 inches above top of pipe, whichever is the least. The wall shall extend at least 12 inches into undisturbed soil on each side of the trench as excavated.

12.4.2.2 Reinforced Concrete

Reinforced concrete cut-off walls shall be a minimum of 8 inches thick and shall have No. 4 reinforcing steel bars on 8-inch centers each way. The reinforcing steel bars shall extend the full length of the wall less 3 inches of cover on ends.

12.4.2.3 Cement Masonry

Cement masonry cut-off walls shall have No. 4 reinforcing steel bars placed vertically on approximately 8-inch centers and No. 4 reinforcing steel bars placed horizontally every 16 inches on center. Voids in the concrete block shall be filled with cement mortar.

12.4.3 Surface Slope Protection

Concrete surface slope protection shall be a minimum of 6 inches thick. The surface slope protection shall extend at least 12 inches on either side of the trench as excavated.

COACHELLA VALLEY WATER DISTRICT

STANDARD SPECIFICATIONS FOR THE CONSTRUCTION OF
DOMESTIC WATER SYSTEMS

PART III - MATERIALS LIST

- 1 COPPER TUBING
 - 1.1 1-inch copper tubing, K-soft
 - 1.1.1 Approved Manufacturers
 - 1. Cerro
 - 2. Mueller
 - 3. Halstead
 - 4. Kobe
 - 1.1.2 Factory Coated Copper Tubing, K-Soft
 - 1. Kamco Aqua Shield
 - 1.2 1½-inch or 2-inch Copper Tubing, Rigid Pipe
 - 1.2.1 Approved Manufacturers
 - 1. Cerro
 - 2. Mueller
 - 3. Halstead
 - 1.2.2 Factory Coated Copper Tubing
 - 1. Kamco Aqua Shield

- 2 SERVICE LINE FITTINGS
- 2.1 Corporation Stops
- 2.1.1 1-, 1½- and 2-inch; IPTx110 Compression
 - 1. Mueller #B-25028
 - 2. AY McDonald #4704BQ
 - 3. Jones #J1935SG
- 2.2 Angle Meter Stops
- 2.2.1 1-inch; 110 Compression x Swivel
 - 1. Mueller #B-24258-1 (no lip on swivel)
 - 2. Ford #BA43-444WQ
 - 3. Jones #J1963WSG
 - 4. AY McDonald #4602BQ
- 2.2.2 1½-inch; 110 Compression x Flange
 - 1. Mueller #B-24276
 - 2. Ford #BFA43-666WQ
 - 3. Jones #J1975WSG
 - 4. AY McDonald #4602BQ
- 2.2.3 2-inch; 110 Compression x Flange
 - 1. Mueller #B-24276
 - 2. Ford #BFA43-666WQ
 - 3. Jones #J1975WSG
 - 4. AY McDonald #4602BQ
- 2.3 Ball Valves, Brass, for Meters Only
- 2.3.1 1-inch, 1½-inch and 2-inch (with lever handle, no lip on swivel)
 - 1. Mueller B-24351-1
 - 2. AY McDonald #6101 MWHB

2.4 Service Saddles

2.4.1 Approved Manufacturers

1. Mueller

A. For 12-inch pipe and smaller, bronze double-strap

- 1) Jones #J-979
- 2) Ford #202B
- 3) Smith-Blair #232

B. For 18-inch pipe and larger, ductile iron service saddle
with triple stainless steel straps

- 1) Smith-Blair #366
- 2) Smith-Blair
- 3) Romac
- 4) Baker
- 5) Jones
- 6) Ford
- 7) Power Seal

2.5 Straight Couplings

2.5.1 1-inch; 110 Compression

1. Mueller #H-15403
2. Jones #J609SG
3. Cambridge #118-H4H4

2.5.2 1½-inch; 110 Compression

1. Mueller #H-15403
2. Jones #J2609SG
3. Cambridge #118-H6H6

2.5.3 2-inch; 110 Compression

1. Mueller #H-15403
2. Jones #J2609SG
3. Cambridge #118-H7H7

3 METER BOXES, POLYMER, BEE LID ONLY

3.1 Meter Boxes for 1-inch Service Lines (Nontraffic Areas)

3.1.1 Approved Manufacturers

1. J&R Concrete #P4-0-CVWD
2. Armorcast
 - A. Box: P6000486
 - B. Cover: A6000483 DQ-CVWD
 - C. Drop-in: A6000487-CVWD

3.2 Meter Boxes for 1-inch Lines (Traffic Areas)

3.2.1 Approved Manufacturers

1. Armorcast
 - A. Box: P6000486SA
 - B. Cover: A6000483TDQ
 - C. Drop-in: A6000487T

2. Approved equal

3.3 Meter Boxes for 1½-inch and 2-inch Lines (Nontraffic Areas)

3.3.1 Approved Manufacturers

1. J&R Concrete #PW6-B-CVWD
2. Armorcast
 - A. Box: P600153X12
 - B. Cover: A6001643DZ-CVWD
 - C. Drop-in: A6000482-CVWD

3.4 Meter Boxes for 1½-inch and 2-inch Lines (Traffic Areas)

3.4.1 Approved Manufacturers

1. J&R Concrete-W6-T-CVWD
2. Armorcast
 - A. Box: A6001640PCX12
 - B. Cover: 60001643TDZ
 - C. Drop-in: A6000482T

4 FIRE HYDRANTS

4.1 Dry Barrel

4.1.1 Approved Manufacturers and Models

1. Muller A423
2. Kennedy K-81A
3. Clow F-2545
4. American Darling (AFC) #B-84-B

4.2 Wet Barrel

4.2.1 Approved Manufacturers and Models

1. James Jones #J-3765
2. Clow #2060
3. AVK

4.3 Check Valve Fire Hydrants (Wet)

4.3.1 Approved Manufacturers and Models

1. Clow #40
2. Long Beach #LB400
3. SBF

5 AIR AND VACUUM RELIEF VALVES AND FITTINGS

5.1 1-inch Air Relief Valves

5.1.1 Approved Manufacturers and Models

1. Crispin Model #UL10
2. Vent-O-Mat Model 025RBX1621
3. ARI Model D-040-1"-P Threaded

5.2 2-inch Air Relief Valves

5.2.1 Approved Manufacturers

1. Crispin Model #UL20
2. Vent-O-Mat Model 050RBX1621
3. ARI Model D-40-2"-P Threaded

5.3 Elbows

5.3.1 Approved Manufacturer (1-inch or 2-inch Compression x FIPT)

1. Mueller IP H15533
2. Jones J2621SG
3. Ford L14-Q
4. AY McDonald 4779Q
5. Cambridge 105 Series

5.3.2 Approved Manufacturer (1-inch or 2-inch Compression x Compression)

1. Mueller H-15526
2. Jones J26115G
3. Ford L44-Q
4. AY McDonald 4761Q
5. Cambridge 105 Series

5.4 Ball Valves

5.4.1 Ball Valve; 1-inch or 2-inch

1. Mueller B25209
2. Jones J1949S6

5.4.2 Corporation Stop; 1-inch or 2-inch IPT x 110 Compression

1. Muller B-25028
2. Jones J1935SG
3. AY McDonald #46704BQ

5.5 Covers

5.5.1 Approved Manufacturers

1. Armorcast
 - A. P6002001-XXX; 24-inch
 - B. P6002002-XXX; 20-inch
 - C. P6002003-XXX; 12-inch
2. Pipeline Products
 - A. COAC-1624
 - B. COAC-1830
 - C. COAC-2030
 - D. COAC-2430

5.6 Fittings

5.6.1 Red Brass Pipe (Threaded Pipe)

1. Per ASTM B43

- 6 PIPE
- 6.1 Ductile Iron Pipe
- 6.1.1 Approved Manufacturers
 - 1. U.S. Pipe
 - 2. Pacific States
 - 3. American CI
 - 4. Clow
 - 5. Griffin Pipe
- 6.2 CML&CMC Steel Pipe
 - 1. Northwest Pipe Company
 - 2. Approved equal

7 PIPE FITTINGS AND MECHANICAL JOINT FITTINGS

7.1 Flanged Fittings (Ductile Iron)

7.1.1 Approved Manufacturers

1. U.S. Pipe
2. Union/Tyler
3. Star
4. Sigma
5. Pipeline Components, Inc. (PCI)
6. Griffin Pipe

7.2 Pipe Restraints

7.2.1 Approved Manufacturers

1. Ebba Iron - Megalug
2. Uniflange
3. Star
4. Romac
5. Sigma Onelok
6. Field-Lok

7.3 MJ Restraint Joints

7.3.1 Approved Manufacturers

1. Ebba Iron - Megalug
2. Uniflange
3. Star
4. Romac
5. Sigma

7.4 Flexible Expansion Joints

7.4.1 Approved Manufacturers

1. EBBA Flex Tend #408F21 (8-inch only)
2. Star #SFPJ5008
3. Romac 4.0 Offset Fla x Fla

7.5 Gaskets

7.5.1 Flange Gaskets

1. 1/16-inch Thick Laminated Nonasbestos Fiber, Cranite
2. Approved equal

7.5.2 Field Lok Gasket (for DIP)

1. U.S. Pipe, Field Lok Gaskets
2. Approved equal

8 VALVES

8.1 Gate Valves (Ductile Iron Body with Resilient Seal)

8.1.1 Approved Manufacturers and Models

1. American Flow 2500
2. U.S. Pipe Metroseal 250R
3. Mueller (M&H) #A2361 Series
4. Clow #F61 Series

8.2 Butterfly Valves (Ductile Iron Body)

8.2.1 Approved Manufacturers

1. Mueller
2. Pratt
- ~~3. M&H (Kennedy)~~
4. Dezurik
- ~~5. K Flow Wolverine (Keystone)~~

8.3 Detector Check Valves

8.3.1 Approved Manufacturers

1. Hershey #EDC III
2. Hershey #EDC IV

8.4 Double Detector Check Valves

8.4.1 Approved Manufacturers

1. Febco #876 W/RW OS&Y
2. Approved equal

8.5 Valve Locking Devices (for Gate Valves)

8.5.1 Approved Manufacturers

1. Protech
 - A. A2600
 - B. A3200
2. Approved equal

9 VALVE WELLS AND BLOW-OFF COVERS

9.1 Valve Well (Body, Triangular)

9.1.1 Approved Manufacturers

1. Brooks
2. J&R Concrete #V4-T
3. South Bay Foundry #4-T

9.1.2 Valve Well

1. 8-inch PVC C-900 CL-150

9.2 Blow-off Cover

9.2.1 Approved Manufacturers

1. South Bay Foundry
2. Approved equal

- 10 PROTECTIVE COATINGS (AND WRAPS)
- 10.1 Polyethelene Wrap
- 10.1.1 Clear or black as per AWWA C-105
- 10.2 Cement Mortar Coatings
- 10.2.1 Class E mortar with Type V cement
- 10.3 Other Coatings
- 10.3.1 Approved Manufacturers
 - 1. NO-OX-ID manufactured by SanChem, Inc.
 - 2. Approved equal
- 10.4 Pipe Tape
 - 1. 10 mil pipe-wrap tape

- 11 CONCRETE VAULTS
- 11.1 Approved Manufacturers
- 11.1.1 200 Series Vaults
 - 1. Jensens #K3048-FH33-27T (BR400-CVWD2)
 - A. With two extensions #PB3048-R6
 - 2. J&R Concrete #3500-IW
- 11.1.2 400 Series Vaults
 - 1. Jensens #K3660-FH45-27T (BR400-CVW2)
 - 2. J&R Concrete #2640-IW
- 11.1.3 500 Series Vaults
 - 1. Jensens #K466-FH45-27T (BR500-CVW2)
 - 2. J&R Concrete #4660-IW

13

CARSONITE UTILITY MARKER POSTS

13.1

Approved Manufacturers

1. Flexstake, Inc. (No. EZWC206W - white with reflective strip)
2. Approved equal.

COACHELLA VALLEY WATER DISTRICT

STANDARD SPECIFICATIONS FOR THE CONSTRUCTION OF
DOMESTIC WATER SYSTEMS

PART IV - SPECIAL PROVISIONS

AMENDMENTS TO THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (SSPWC)

SP-1 If any conflict exists between the Standard Specifications for Public Works Construction (SSPWC) and other provisions of this Specification, the other provisions of this Specification shall govern unless otherwise agreed in writing by the parties hereto.

SP-2 The following supplements modify, change, delete from or add to the SSPWC. Where any section of the SSPWC is modified or any paragraph, subparagraph or clause thereof is modified or deleted by these supplements, the unaltered provisions of that section, paragraph, subparagraph or clause shall remain in effect.

The section references and titles used herein identifies the section numbers in the SSPWC.

SP-3 Amend the SSPWC as follows:

SECTION 1 - TERMS, DEFINITIONS, ABBREVIATIONS AND SYMBOLS

Delete Part 1 - GENERAL PROVISIONS, excepting therefrom Section 1-2, DEFINITIONS; Section 1-3, ABBREVIATIONS; 1-4, SI; and 1-5, SYMBOLS.

1-2 **DEFINITIONS**

Delete the definitions of AGENCY, BOARD and ENGINEER, and add the following:

AGENCY - The individual, partnership, corporation, joint venture or other legal entity entering into a contract with the Contractor to have work performed. The word AGENCY shall include the word DEVELOPER.

BASEMENT MATERIAL - The material in excavation or embankments underlying the lowest layer of subbase, base pavement, surfacing or other specified layer which is to be placed.

BOARD - The Board of Directors of the Coachella Valley Water District.

ENGINEER - Whenever not qualified, the Chief Engineer of the Coachella Valley Water District, acting either directly or through his properly authorized representative, such representative acting severally within the scope of the particular duties entrusted to them.

MAIN - Any pipeline six inches in diameter or larger used for transmission and distribution of domestic water.

NON-CORROSIVE SOIL - A soil in which the effect of corrosion on underground steel water mains can be neglected for the service life of the pipe as determined by actual observations and conclusions made by a properly qualified person. In addition to the consideration of soil temperature, pH and potential measurements, the resistivity of the soil shall be over 1,000 ohms per cubic centimeter.

DEVELOPER - Any individual, firm, association, syndicate, copartnership, corporation, trust or any other legal entity commencing proceedings under an applicable county ordinance to effect a subdivision of land thereunder for itself or for another or any other legal entity who is making improvements on single or multiple parcels of land.

SUBDIVISION - The division of any improved or unimproved land, shown on the latest equalized County Assessment Roll as a unit or as contiguous units, for the purpose of sale, lease or financing, whether immediate or future, except for leases of agricultural land for agricultural purposes. Subdivision includes a condominium or a community apartment project as defined in Section 11004 of the Business and Professions Code.

SURFACING - The uppermost layer of material placed on the traveled way or shoulder. This term is used interchangeably with pavement.

1-3 ABBREVIATIONS

1-3.2 Common Usage

Add the following:

<u>Abbreviation</u>	<u>Word or Words</u>
gpm	Gallons per minute

1.3.3 Institutions

Add the following:

<u>Abbreviation</u>	<u>Word or Words</u>
NSF	National Sanitation Foundation

1-4 METRIC INTERNATIONAL SYSTEM (SI)

1.4.2 Metric Units

Add the following:

<u>Abbreviation</u>	<u>Units</u>
mg	Milligram
mg/L	Milligram per liter

1-5 SYMBOLS

Add the following:

Ø	Diameter
Chw	Hazen-William Coefficient

SECTION 201 - CONCRETE, MORTAR AND RELATED MATERIALS

201-1 Portland Cement Concrete

201-1.1 Requirements

201-1.1.2 Concrete Specified by Class

Add the following items to the table:

Construction	Concrete Class Metric Units (U.S. Standard Measures)	Maximum Slump Millimeters (Inches)
--------------	--	--

STREET SURFACE IMPROVEMENTS

Concrete surrounding manholes,
valve covers, vault frames,
drainage facilities for slopes,
sidewalks, cross gutters and
driveways.

310-A-17 (520-C-2500)	100 (4)
--------------------------	------------

201-1.2 Materials

201-1.2.1 Portland Cement

Delete first paragraph and add the following:

All the cement to be used or furnished shall be Type V Portland Cement conforming to ASTM C 150 unless otherwise specified.

203-1 PAVING ASPHALT

203-1.1 General

Add the following:

The mixes listed in the table below shall be used unless otherwise specified (types shall be in accordance with Subsection 203-6.3.2):

TYPE	USAGE
B (Medium Coarse)	Base course for streets (machine or hand laid) Base course for alleys (machine or hand laid) Base course for trench resurfacing (machine laid)
C1 (Medium)	Wearing surface for streets and alleys (machine laid) Leveling course (machine laid) Overlay (capping) 1½-inch minimum thickness (machine laid) Surfacing for streets, 4 inches total thickness (machine laid)
D1 (Fine)	Wearing surface for streets and alleys (hand laid) Wearing surface for trench resurfacing (machine laid) Asphalt sidewalks Overlay (capping) less than 1½-inch thick (machine laid) Extruded curb

SECTION 207 - PIPE

Pipe for use as domestic water transmission or distribution mains shall be either CML/CMC steel pipe per Subsection 207-10 or CML ductile iron pipe per Subsection 207-9.

207-10 STEEL PIPE

207-10.2 Fabricated Steel Pipe

207-10.2.1 General

Delete the fourth paragraph and the last paragraph and add the following paragraph:

After fabrication, but prior to the application of the specified cement mortar lining and cement mortar coating, straight pipe cylinders of all sizes shall be successfully hydrostatically tested in accordance with Section 3.4 of AWWA C200.

Pipe shall be manufactured, coated and lined by one company with no subcontractors or subcontracting permitted.

207-10.2.2 Design Criteria

Delete the last paragraph and add the following paragraph:

On 18-inch pipelines and smaller, the steel cylinder wall thickness shall not be less than 12 gauge. On pipelines larger than 18-inch and through 30-inch, the steel cylinder wall thickness

shall not be less than 10 gage. On pipelines larger than 30-inch, the thickness of the steel cylinder wall shall be as determined by the Engineer.

207-10.2.3 Diameter

Delete this Subsection and add the following Subsection:

Fabricated steel pipe shall have a nominal steel cylinder outside diameter (O.D.), before the application of exterior protective coatings as shown in the following chart:

<u>Nominal Pipe Size Inches</u>	<u>Cylinder O.D. Inches</u>	<u>Permissible Tolerance Inches</u>
8	8-5/8	(-) 1/4, (+) 0
12	12-3/4	(-) 1/4, (+) 0
18	19-25/32	(-) 1/4, (+) 1/8
24	25-3/4	(-) 1/4, (+) 1/8
30	31-7/8	(-) 1/4, (+) 1/8
Larger than 30	As determined by the Engineer	

207-10.2.4 Length

Delete the first paragraph and add the following paragraph:

Unless otherwise specified, fabricated steel pipe shall be manufactured to a maximum nominal pipe laying length of 10, 20 or 40 feet. Bell and spigot pipes fabricated to other lengths will not be allowed.

207-10.2.5 Joints

Delete the first, third, fifth and last paragraphs and add the following paragraphs:

Joints for fabricated steel pipe shall either be bell and spigot ends with rubber gaskets or plain ends fitted with flanges unless otherwise specified on the Plans and shall comply with the requirements of Section 3.6 of AWWA C200.

Steel flanges shall be Class 150 flat-faced steel ring slip-on flanges, in accordance with ASTM A-181 and ANSI B 16.5 for size 12 inches or less, unless otherwise specified on the Plans.

Flanges larger than 12-inch shall be Class 150 flat-faced steel ring slip-on flanges in accordance with ASTM A-181 and ANSI B 16.5, less the hub, unless otherwise specified on the Plans.

The laying of bell and spigot rubber gasket joint pipe on curved alignment by means of unsymmetrical closure of spigot into bell will be permitted. The maximum allowable joint deflection shall be as follows:

<u>Nominal Pipe Size</u> <u>Inches</u>	<u>Allowable Deflection</u> <u>Degress - Minutes</u>
6	2 - 30
8	2 - 30
12	2 - 30
18	1 - 30
24	1 - 0
30	1 - 0
36	0 - 45
Larger than 36	As determined by the Engineer

Where the allowable deflection of the pipe by means of unsymmetrical closure of joints is not sufficient to fit the curved alignment of the pipe the deflection shall be made with special sections per Subsection 207-10.2.7.

207-10.2.7 Special Section

Delete this Subsection and add the following Subsection:

Fittings on steel pipelines shall be CML/CMC steel or ductile iron with flanged joints.

Steel fittings shall be fabricated in accordance with AWWA C200, Section 4, from steel pipe with minimum wall thickness of 10 gage. The steel fittings dimensions shall be in accordance with AWWA C208 and Detail Drawing No. W-14. The steel fittings shall be cement mortar lined and coated in accordance with Subsection 207-10.4.

Ductile iron fittings shall be in accordance with AWWA C110 with flanged joints and cement mortar linings.

Add the following Subsection:

207-10.2.9 Polyethylene Encasement for External Corrosion Protection

When loose polyethylene encasement for the protection of steel pipe and its fittings, valves, services and appurtenances is specified in the Plans or in the Specifications, it shall be furnished and installed in accordance with AWWA C105. Polyethylene encasement shall be the tube type and shall be installed in accordance with Installation Method A. Services tapped into steel pipe encased in polyethylene shall be installed in accordance with Installation Method No. 1 with polyethylene adhesive tape and TC-3, SERVICES.

207-10.3 Mill-Type Steel Water Pipe

207-10.3.1 General

Add the following paragraphs:

Schedule 40 (standard weight) pipe shall be the minimum class of pipe acceptable for domestic water purposes.

Mill type steel water pipe shall be lined and coated as shown on the Plans or if not noted on the Plans, in accordance with these Specifications.

207-10.3.4 Joints

Delete paragraph (d) Flanged Joints and insert the following paragraph:

(d) Flanged Joints. Steel flanges shall be Class 150 flat faced steel ring slip-on flanges, in accordance with ASTM A-181 and ANSI B 16.5 for size 12 inches and less, unless otherwise specified on the Plans.

Flanges larger than 12-inch shall be Class 150 flat faced steel ring slip-on flanges, in accordance with ASTM A-181 and ANSI B 16.5, less the hub, unless otherwise specified on the Plans.

207-10.3.5 Special Sections

Delete this Subsection and add the following Subsection:

Special sections for mill type steel pipe shall be in accordance with Subsection 207-10.2.7.

207-10.4 Protective Lining and Coating for Steel Pipe

207-10.4.1 General

Delete this Subsection and add the following Subsection:

Fabricated steel pipe and special sections shall be cement mortar lined and coated in accordance with Subsection 207-10.4.2.

Mill type steel pipe shall be lined and coated as shown on the Plans or, if not shown on the Plans, in accordance with these Specifications.

207-10.4.2 Cement Mortar Lining and Coating

Delete the first paragraph and add the following paragraphs:

Cement-mortar lining and coatings shall be in accordance with AWWA C205 as modified below:

a. Section 2.2 Portland Cement: Portland Cement shall conform to the requirements of Type V cement, ASTM C150 or Type II cement with admixtures to achieve the same properties as Type V.

b. Section 5.3 Thickness: Revise Table 2 as follows:

<u>Nominal Pipe Size</u> <u>Inches</u>	<u>Coating Thickness</u> <u>Inches</u>	<u>Tolerance</u> <u>Inches</u>
4-12	1	+ 1/8
13-19	1-1/8	+ 1/8
20 or more	1-1/4	+ 1/8

SECTION 211 - SOILS AND AGGREGATE TESTS

211-2 COMPACTION TESTS

211-2.2 Field Density

Delete this Subsection and add the following Subsection:

Field density tests shall be performed in accordance with the test procedure specified in ASTM D 1556 or ASTM D 2992. In place densities and moisture contents may be determined by the use of State of California Test Method No. 231-E.

SECTION 300 - EARTHWORK

300-1 CLEARING AND GRUBBING

300-1 General

Add the following paragraph:

No trees shall be removed without prior written permission from the Engineer. The cutting down or removal of trees is prohibited between the hours of 6:00 p.m. and 7:00 a.m. and on any Saturday, Sunday or legal holiday unless permission is obtained from the Engineer.

SECTION 306 - UNDERGROUND CONDUIT CONSTRUCTION

306-1 OPEN TRENCH OPERATIONS

306-1.1.1 General

Add the following paragraphs:

In the event that blasting is necessary in excavating, the blast shall be blanketed with chain links and carpet mats. No blasting shall be done within five feet of any water, gas, sewer or other pipe, main or conduit intersecting the excavation. No blasting will be allowed except by permission in writing from the Engineer.

Any excavation carried down below the grades shown on the Plans or in excess of those ordered by the Engineer shall be refilled in layers and compacted to 90 percent relative compaction or Class 470-B-2000 concrete. Such work shall be done entirely at the Contractor's expense.

The Contractor shall furnish, install and operate all the necessary machinery, piping, appliances and equipment to keep the excavation reasonably free from water during construction and shall dispose of the water as approved by the Engineer. He shall have on at all times hand sufficient pumping equipment and machinery in good working condition for all ordinary emergencies. Competent mechanics for the operation of all pumping equipment shall be available at all times and he shall provide all means and facilities necessary to conduct water to the pumps.

The trench and other excavation shall be kept entirely free of water while concrete or pipe is being placed and until all concrete or mortar has set hard.

Water shall be disposed of in such a manner as will not cause injury to public or private property, nor be a nuisance or a menace to the public.

Other methods of water control, other than dewatering, shall be subject to the approval of the Engineer.

306-1.2 Installation of Pipe

306-1.2.2 Pipe Laying

Add the following paragraphs:

a. Steel and ductile iron pipe, fittings, valves, services and other steel or iron appurtenances shall be protected with polyethylene encasements in accordance with these Specifications.

b. Steel pipe shall be bonded with bonding clips in accordance with Detail Drawing No. W-35 and cathodic protection test stations installed where shown on the Plans in accordance with Detail Drawing No. W-36.

For all pipelines, an Engineer approved mandrel, Detail Drawing No. W-28, shall be pulled through the pipe by hand to ensure the pipe is debris free during the construction process.

306-1.2.14 Field Jointing of Steel Pipe

(a) Flanged Joints. Flanged joints shall be firmly and fully bolted with machine bolts of proper size. Approved 1/16-inch thick, full faced, nonasbestos gaskets shall be used at all flanged joints. Rubber gaskets shall not be installed. After the installation of the pipe, the cement mortar shall be repaired, if necessary, and the flanged joint coated in accordance with Article TC-10, FIELD APPLICATION OF PROTECTIVE COATINGS. Flanges shall be attached to the pipe in accordance with AWWA C207.

(b) Bell-and-Spigot Joint. The gasket and gasket seal inside the bell shall be wiped clean before the gasket is inserted. A thin film of soft vegetable soap compound shall be applied to the gasket and the outside of the spigot end of the pipe. The spigot shall then be positioned inside the bell and shoved home. Lubricant other than that furnished with the pipe shall not be used unless approved by the Engineer. Where specified on the Plans or in these Specifications, joint bonding clips shall be installed on the joints as shown on Detail Drawing No. W-35. The bonding clips shall be as approved by the Engineer.

The joint shall then be cement mortar coated in accordance with Article TC-10, FIELD APPLICATION OF PROTECTIVE COATINGS.

306-1.4 Testing Pipelines for Leakage

306-1.4.5 Water Pressure Test

Add the following:

C = 0.50 for fabricated steel pipe with rubber gasket joints.

C = 0.50 for ductile iron pipe with mechanical or rubber gasket joint.

No leakage is allowed for steel pipe with flanged or welded joints.

306-1.5.2 Permanent Resurfacing

Add the following paragraph:

Except as approved by the Engineer, no more than 20 working days shall elapse at a specific location between the removal of asphalt pavement and the placing of the final pavement at that location. Where paving is to be done at separate widely spaced areas, the Contractor shall schedule the operations to meet these time limitations and progressively complete work from one end of the project to the other. Unless the placing of the finish course immediately follows the removal of asphaltic wearing surface, temporary pavement shall be placed and maintained in good condition adjacent to all stepped edges in rough areas within the area to be paved to provide a smooth surface for traffic.

306-2 JACKING OPERATIONS

306-2.1 General

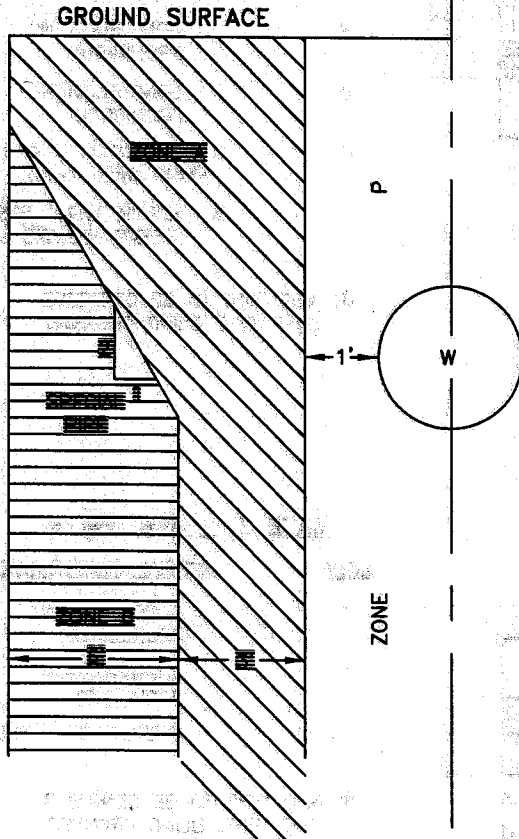
Delete the sixth paragraph.

COACHELLA VALLEY WATER DISTRICT

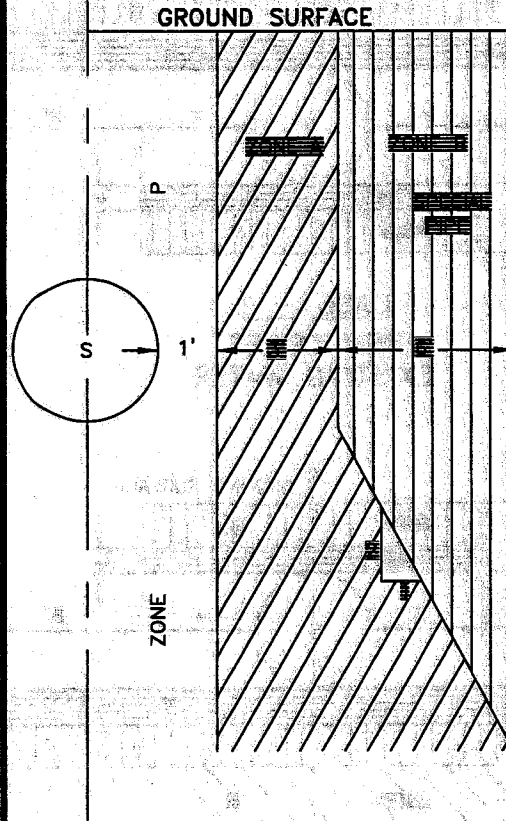
STANDARD SPECIFICATIONS FOR THE CONSTRUCTION OF
DOMESTIC WATER SYSTEMS

PART V - DETAIL DRAWINGS

CASE 1
NEW SEWER
EXISTING WATER LINE



CASE 2
NEW WATER
EXISTING SEWER LINE

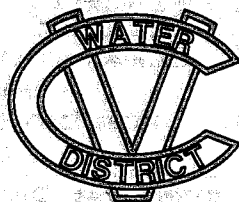


CASE 1 - NEW SEWER

ZONE	SPECIAL CONSTRUCTION
P	CONSTRUCTION PROHIBITED
A	CONSTRUCTION PROHIBITED
B	1. VCP, TYPE "G" JOINT 2. PVC-AWWA C 900 DR-14 OR AWWA C-905 DR-14

CASE 2 - NEW WATER

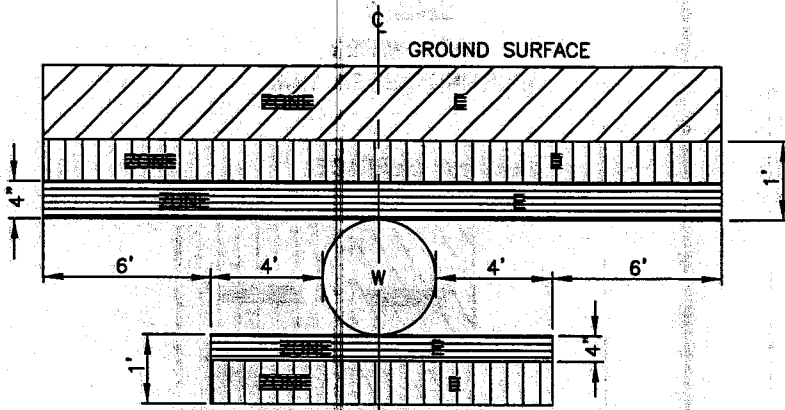
ZONE	SPECIAL CONSTRUCTION
P	CONSTRUCTION PROHIBITED
A	CONSTRUCTION PROHIBITED
B	DUCTILE IRON PIPE



COACHELLA VALLEY WATER DISTRICT

**SEPARATION AND CONSTRUCTION
 REQUIREMENTS
 FOR SEWER AND WATER LINES
 (PARALLEL CONSTRUCTION)**

APPROVAL DATE: OCT 2005 W-1/S-3

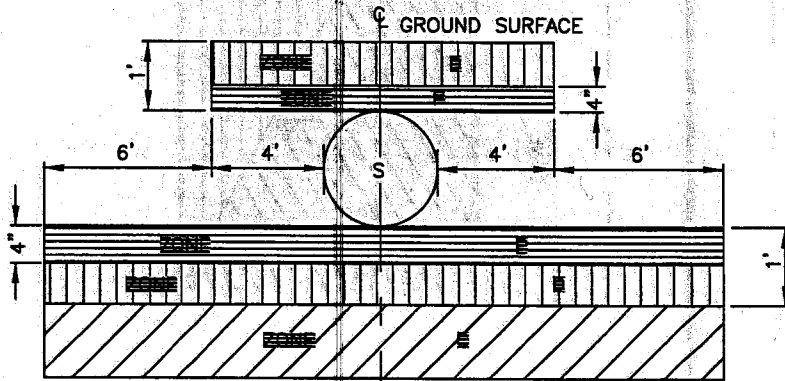


CASE - 1
NEW SEWER
EXISTING WATER

CASE 1 - NEW SEWER

ZONE SPECIAL CONSTRUCTION

- P CONSTRUCTION PROHIBITED
- D CONSTRUCTION PROHIBITED
- C
 1. PVC-AWWA C 900 DR-14
 - OR AWWA C-905 DR-14
 2. VCP IN 1/4" STEEL SLEEVE, WELDED JOINTS.
- NEW PIPE TO BE CENTERED OVER PIPE BEING CROSSED



CASE - 2 & 3
NEW WATER/ WATER SERVICE
EXISTING SEWER

CASE 2 - NEW WATER

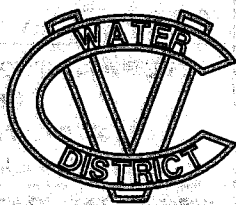
ZONE SPECIAL CONSTRUCTION

- P CONSTRUCTION PROHIBITED
- D CONSTRUCTION PROHIBITED
- C DUCTILE IRON PIPE
- NEW PIPE TO BE CENTERED OVER PIPE BEING CROSSED

CASE 3 - NEW WATER

ZONE SPECIAL CONSTRUCTION

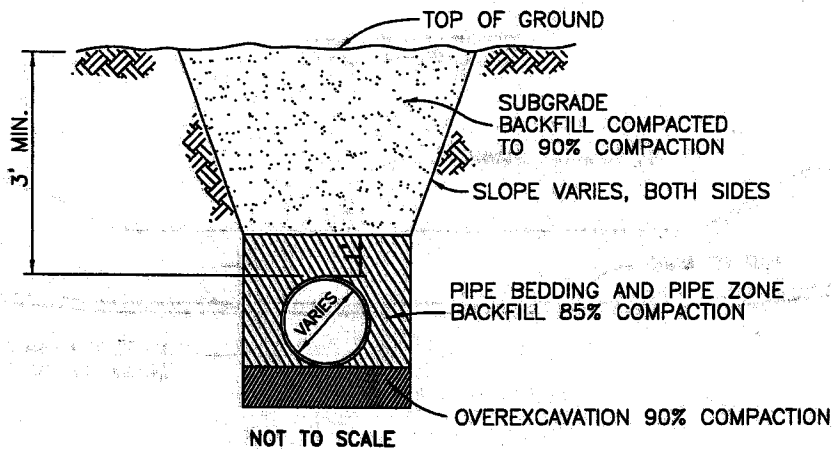
- C COPPER-NO JOINTS



COACHELLA VALLEY WATER DISTRICT

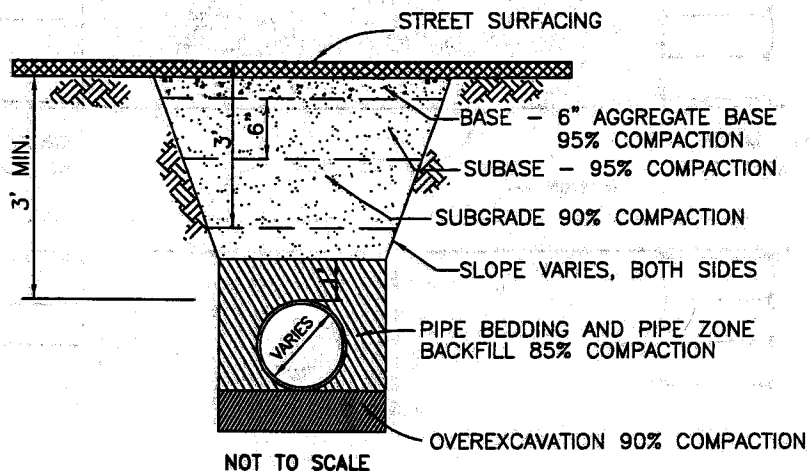
SEPARATION AND CONSTRUCTION REQUIREMENTS FOR SEWER AND WATER LINES (CROSSINGS)

APPROVAL DATE: OCT 2005 W-2/S-4



NOT TO SCALE

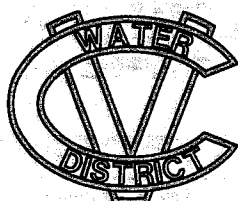
ROADSIDE STRIPS, MEDIANS & EASEMENTS



NOT TO SCALE

RE-SURFACED STREETS

- NOTES:**
1. OVEREXCAVATION IN UNSUITABLE FOUNDATION ZONES SHALL BE PER SPECIFICATIONS.
 2. SEE SPECIFICATION FOR PVMT REQUIREMENTS.
 3. FOR SOIL CONDITIONS, WHICH WARRANT SPECIAL BEDDING SEE SPECIFICATION 306-1.2.1
 4. ALL EXCAVATION SHALL CONFORM TO CONSTRUCTION SAFETY ORDER, DIV. INDUSTRIAL SAFETY.
 5. REQUIREMENTS OF LOCAL JURISDICTION SUPERCEDE DISTRICT'S REQUIREMENTS WHERE APPLICABLE.

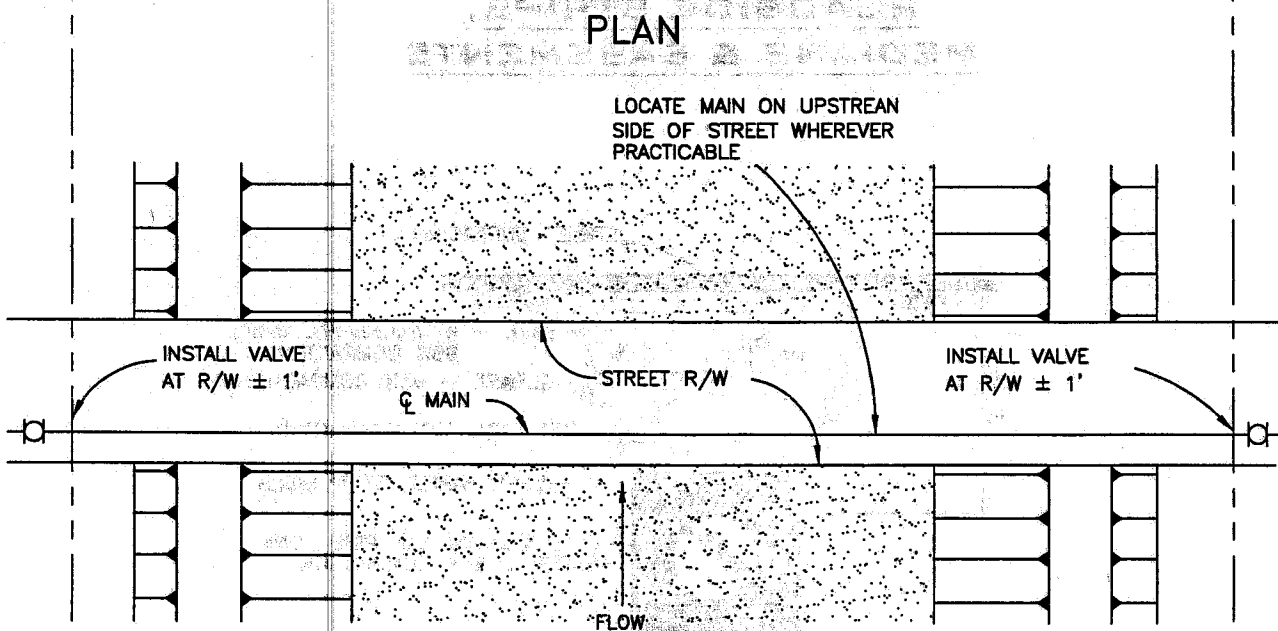
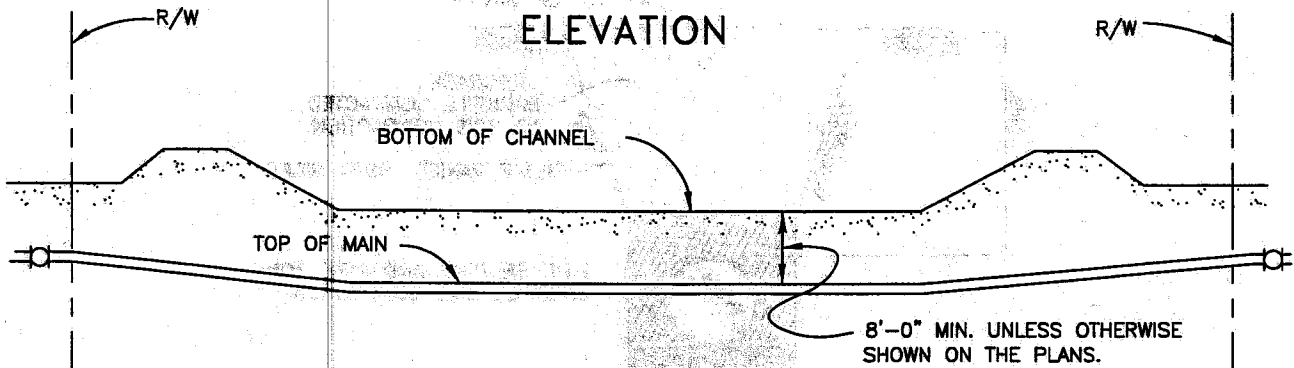


COACHELLA VALLEY WATER DISTRICT

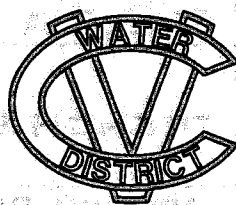
TRENCH BACKFILL DETAILS

APPROVAL DATE: OCT 2005

W-3



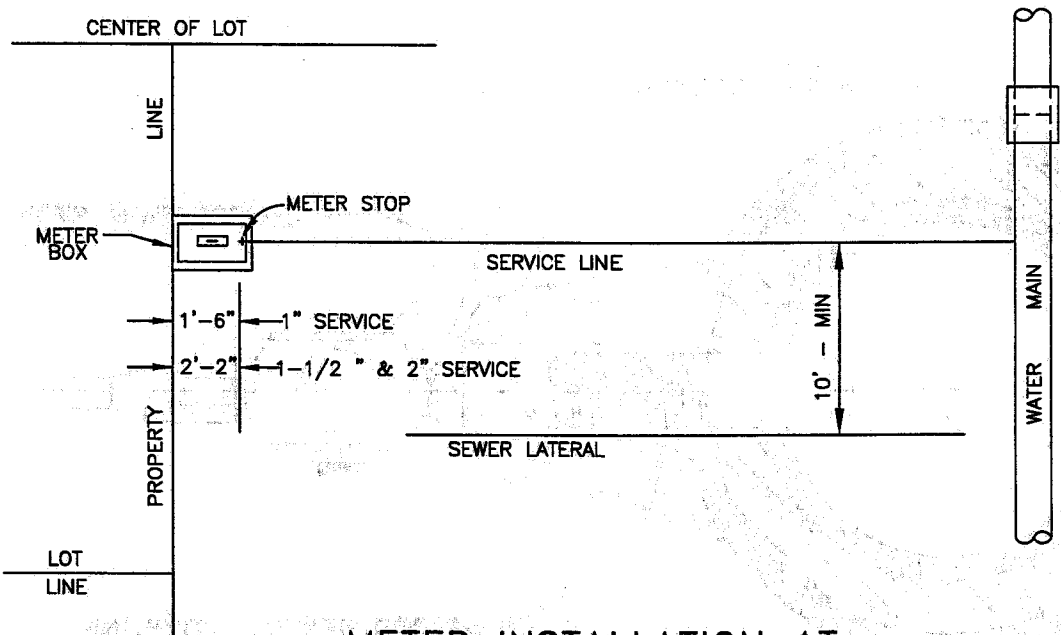
- NOTES:
1. WHERE NO STREET SURFACING IS TO BE INSTALLED, THE PIPE SHALL BE INSTALLED AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. WITH RESPECT TO ALIGNMENT.
 2. DUCTILE IRON PIPE WITH RESTRAINED JOINTS, TR FLEX OR APPROVED EQUAL.
 3. INSTALL AIR/VAC SIZED PER MANUFACTURERS RECOMMENDATION AND CONSTRUCT IN ACCORDANCE WITH DETAIL.



COACHELLA VALLEY WATER DISTRICT
**TYPICAL MAIN CROSSING
 AT
 STORMWATER CHANNEL**

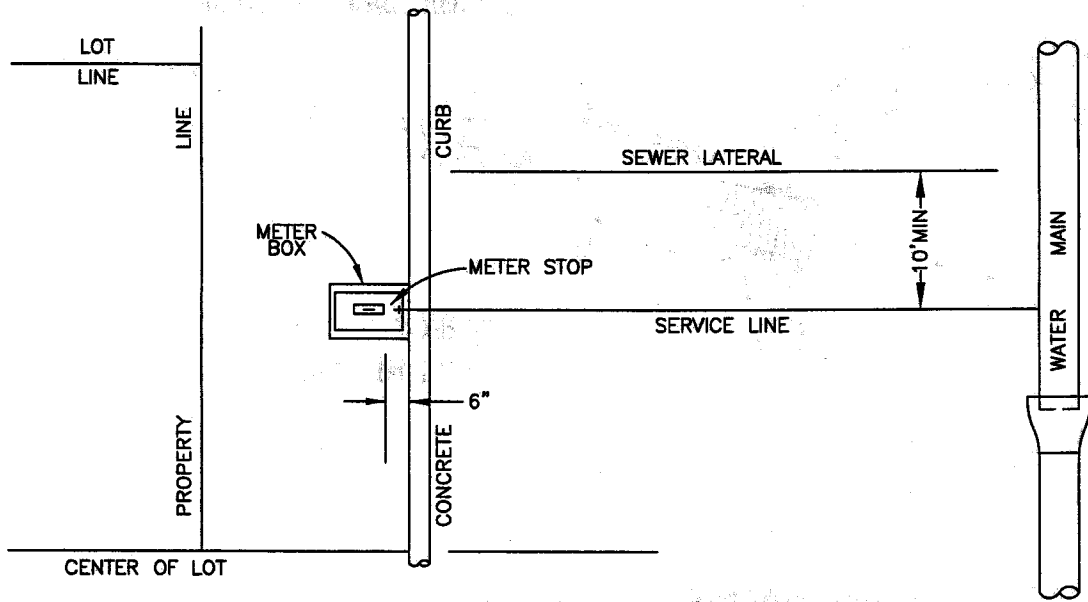
APPROVAL DATE: OCT 2005

W-4

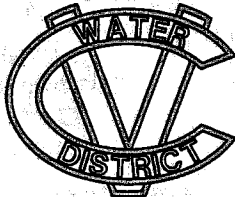


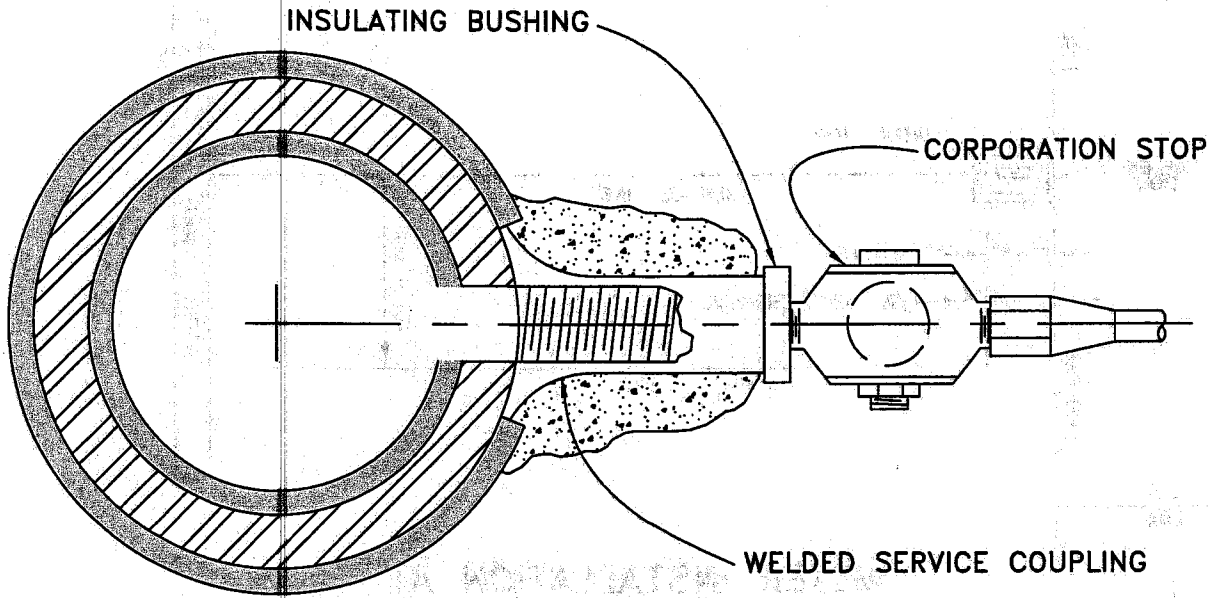
METER INSTALLATION AT PROPERTY LINE

- NOTE: 1. IF SIDEWALK IS ADJACENT TO THE CURB THE METER BOX IS TO BE LOCATED OUTSIDE AND ADJACENT TO SIDEWALK.
 2. FOR SERVICE INSTALLATION DETAILS, SEE DETAIL DRAWINGS W-7A, W-7B, W-8, W-9A, W-9B, W-11A, W-11B

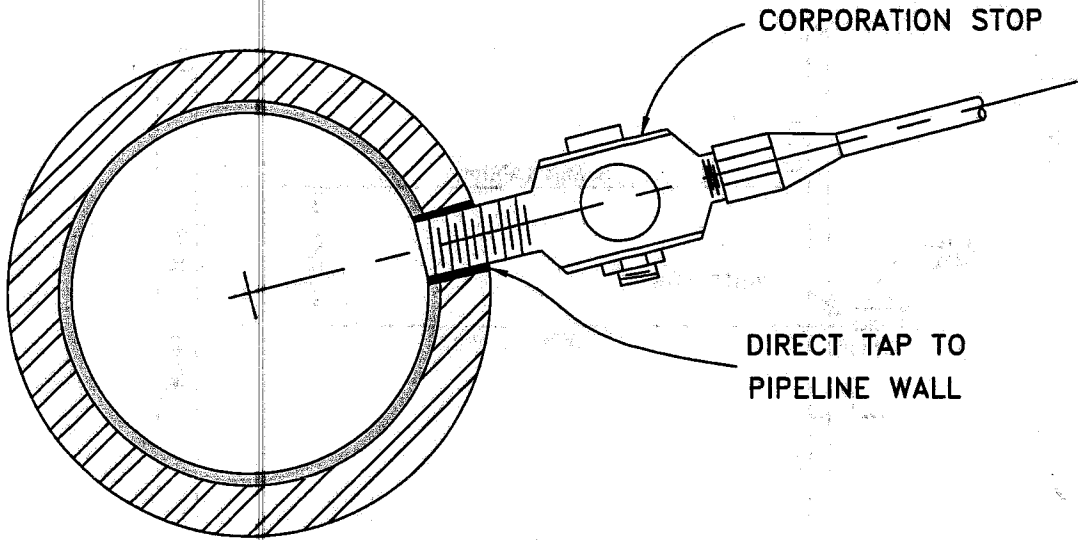


METER INSTALLATION AT CONCRETE CURB LINE

	COACHELLA VALLEY WATER DISTRICT	
	GENERAL LOCATION OF SEWER LATERAL AND WATER METER / WATER SERVICE INSTALLATION	
	APPROVAL DATE: OCT 2005	W-5/S-43

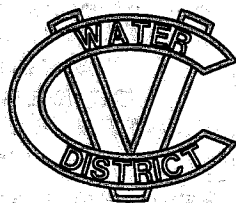


CML/GMC STEEL MAINS



GML DUCTILE IRON MAINS

REF: SEE ARTICLE TC-3



COACHELLA VALLEY WATER DISTRICT

DETAIL OF SERVICE CONNECTION TO MAIN
CML/CMC STEEL &
GML DUCTILE IRON

APPROVAL DATE: OCT 2005

W-6