DISTRICT SPECIFICATIONS

FOR

DEVELOPERS AND CONTRACTORS FOR

DOMESTIC WATER SYSTEM

QUARTZ HILL
WATER DISTRICT

November 2016

DISTRICT SPECIFICATIONS FOR
DEVELOPERS AND CONTRACTORS FOR
DOMESTIC WATER SYSTEM

QUARTZ HILL WATER DISTRICT

Approved by the Board of Directors on _____ ___,_____

Approved:

Chad Reed – General Manager

Recommended for Approval:

Brent Byrne – Assistant General Manager

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GENERAL PROVISIONS

1. DEFINITIONS, TERMS, AND ABBREVIATIONS

1.1. DEFINITIONS

Whenever the following terms or abbreviations occur in these specifications, the meaning shall be interpreted as follows:

BOARD OF DIRECTORS OR BOARD - The Board of Directors of the Quartz Hill Water District.
CONTRACT - The agreement executed between the Owner and the District covering the water system improvements to be constructed and to become a part of the District's facilities.

CONTRACTOR - The person, firm, or corporation constructing the water system improvements for the Owner.

DAYS - When used to designate a period of time, shall be in reference to consecutive calendar days.

DISTRICT - Quartz Hill Water District, Los Angeles County, California. Where the word "District" is used in a sense requiring action, such as, approving, inspecting, making a decision, etc., the "DISTRICT GENERAL MANAGER" shall be understood as the person having the authority to take the required action.

DISTRICT GENERAL MANAGER - The Manager of Quartz Hill Water District, their authorized representative, or other such person as may be designated by the District.

FINAL ACCEPTANCE - That formal action by the Board accepting the Project as fully completed by the District General Manager.

INSPECTOR - The Inspector employed by the District to perform inspection during construction of the work undertaken by the Owner.

LABORATORY - The laboratory approved by the District to test materials and work involved in the contract.

LEGAL ADDRESS OF OWNER - The address shown as the Owner's in Article VIII of the contract as the place to which all notices, letters or other communications to the OWNER shall be mailed or delivered.

OWNER - The applicant or subdivider installing or constructing the water system improvement for integration into the Quartz Hill Water District existing water system.

PERMIT - Authorization by the District in writing allowing the Owner to do, or have done, work on District-owned water facilities. The Owner shall have present the Permit at the job site and shall present it if demanded by any District representative.

PLANS - The official plans, profiles, typical cross-sections, working drawings, detail drawings and supplemental drawings, or exact reproduction thereof, approved by the District, which show the locations, character, dimensions and details of the work to be performed.

PROJECT - The water system improvements to be constructed pursuant to the Contract.

SPECIFICATIONS - The directions, provisions, and requirements approved by the District, pertaining to the method and manner of performing the work shown on the Plans. The Specifications include these District Specifications for Developers and Contractors for Domestic Water Systems as adopted by the District and amended from time to time.

STATE SPECIFICATIONS - The Standard Specifications, State of California, Department of Transportation, latest edition.

SUBCONTRACTOR - A person, firm or corporation supplying labor, or labor and materials for the Project as a part of the Contractor's obligation to the Owner.

SURETY - The party or parties who guarantee the completion of the Project or a portion of the Project, by bonds, and whose signatures are attached to the bond.

1.2. TERMS

Whenever in the Specifications or upon the Plans the words directed, required, permitted, ordered, designated, prescribed or terms of like import are used, it shall be understood that the requirements, permission, order, designation, or prescription of the District is intended. Similarly, the terms approved, acceptable, satisfactory, or equal, or terms of like import, shall mean approved by, or acceptable to, or satisfactory to the District, unless otherwise expressly stated. The word "provide" shall be understood to mean furnish and install.

1.3. ABBREVIATIONS

Wherever the following abbreviations are used, they shall have the meanings indicated:

ACI	American Concrete Institute
ASTM	American Society for Testing and Materials
AWWA	American Water Works Association
QHWD	Quartz Hill Water District

1.4. APPLICABILITY

In those cases when, in the opinion of the District, circumstances require the design and construction of any water system improvements not adequately covered by these specification, the District may set different design criteria, require use of other materials, and/or require special construction techniques.

2. PLAN PREPARATION AND EASEMENTS

2.1. PRELIMINARY INVESTIGATION

The Owner shall meet with the District at the earliest practical date to determine whether the property to be developed is within the District boundaries. At that time, the availability of existing water lines can also be reviewed. In some areas, a preliminary feasibility investigation and report may be necessary to establish that the District can serve the proposed development. All costs for such an investigation and any associated reports shall be borne solely by the Owner. Advance cash deposits in amounts to be determined by the District may also be required.

2.2. PLAN PREPARATION

The Plans for review must be prepared under the direct supervision of a registered civil engineer licensed to practice in the State of California. This requirement must be attested to by the Owner's engineer's seal and signature on the Plans. Final plans shall be submitted in hard copy and electronic form and with a minimum scale of 1-inch equals 50 feet and a plan to profile scale of 5 to 1. Electronic copies of the plans shall be submitted as PDF files compatible with the current version of Adobe Acrobat. Plans must clearly indicate coordinate system used. Elevations shall clearly indicate the vertical control used. Hard copies shall be submitted on 22"x36" 32 lb. weight presentation bond paper bounded using a binding strip. Any deviation from the scale requirements shall be approved by the District. Water plans shall be prepared separately from plans for other improvements. Sufficient detail shall be included on the Plans to show adequate cover over pipelines and services, clearances at crossings, (such as sewer, storm drains, etc.), and location of piping and appurtenances. Standard Detail W-1 "Water notes" shall be required on the cover sheet of the water improvement plans.

One (1) 22"x36" hard copy shall be submitted to the District for each review. The Owner shall at that time make a deposit of the amount specified in the Contract to cover the cost of plan checking. In the event the plan checking does not require all such deposit, then the balance thereof will be refunded to the Owner. If the plan checking and inspection costs exceed the amount so deposited, the Owner shall forthwith deposit a sum sufficient to cover such deficiency.

2.3. RECORD DRAWINGS

During construction of the improvements, the Owner shall note deviations from the Plans on a set of the Plans specifically set aside for this purpose. Any changes shall be made on the originals of the Plans with a suitable note on each sheet stating that the originals are the "Record Drawings." The Record Drawings shall be filed with and become the property of the District prior to Final Acceptance by the District of the Project. Complete Record Drawings shall be submitted in PDF format, in AutoCAD DWG (latest version), and as ESRI Shape Files.

2.4. EASEMENTS

When an easement(s) is required for construction and/or maintenance of pipelines, the minimum width shall be 20 feet unless otherwise agreed to in writing by the District. However, there may be instances where easements of a greater width are required as determined by the District. Easements shall be granted and executed prior to District approval of the Plans. The form of the grant of easement document shall be approved by the District. Easements shall be shown on the Plans.

2.5. CONTRACT

The Contract between the Owner and the District covering the water system improvements shall be executed prior to construction of the water system improvements (see Appendix A).

3. CONSTRUCTION AND INSPECTION

3.1. GENERAL

The Owner shall provide all transportation, materials, equipment, labor and supplies to complete excavation, backfill, street repairing, and other work incidental to the construction of the Project.

3.2. GOVERNING SPECIFICATIONS

All facilities to be dedicated to the District shall be constructed in accordance with the District Specifications unless otherwise approved. If Owner wishes to deviate from the District Specifications, provide a cover letter with the plan submittal describing all such deviations in detail.

3.3. EXCAVATION PLANS FOR WORKER PROTECTION

The Owner shall submit to the District, in advance of excavation, a detailed plan showing the design of shoring, bracing, sloping, or other provisions to be made for worker protection from the hazard of caving ground during the excavation of any trench or trenches 5 feet or more in depth. The plan shall be prepared by a registered civil or structural engineer. As a part of the plan, a note shall be included that certifies that the plan complies with the CAL-OSHA Construction Safety Orders, or that the registered civil or structural engineer certifies that the

plan is not less effective than the shoring, bracing, sloping, or other provisions of the Safety Orders.

The detailed plan showing the design of shoring, etc., shall include surcharge loads for nearby embankments and structures, for spoil banks, and for construction equipment and other construction loadings. The plan shall indicate for all trench conditions the minimum horizontal distances from the side of the trench at its top to the near side of the surcharge loads.

Nothing contained in this article shall be construed as relieving the Owner of the full responsibility for complying with the miscellaneous safety provisions contained in Chapter 9, Part 1, Division 5 comprising Sections 6700 through 6719 of the Labor Code of the State of California.

3.4. CONNECTION TO EXISTING FACILITIES

No connection shall be made to existing facilities of the District without prior approval and inspection by representatives of the District, and submittal of bacteriological testing report to the District. Only District personnel shall operate District facilities (e.g., isolation valves, pumps, etc.).

3.5. NOTICE

No work shall be performed unless:

(a) there has been a pre-construction meeting with representatives of the District, Owner, and Contractor in attendance;

(b) District has been given written notice of the name and telephone number of Contractor's job superintendent who shall be Contractor's representative at the job site and shall have authority to act on behalf of Contractor, and the name of and telephone number of Contractor's alternate in the event the job superintendent is unavailable; and

(c) District has been given at least five (5) days written notice of the commencement of work.

3.6. OTHER PERMITS

The Owner shall secure all required encroachment permits and licenses, pay all charges and fees related thereto, and give all notices as required for the Project by other agencies having jurisdiction. Copies of permits and licenses shall be filed with the District prior to construction.

3.7. CONSTRUCTION WATER

Water used for construction, testing and dust control shall be arranged for and furnished by the Owner at their expense. The Owner shall comply with all regulations of the District

relative to connection to fire hydrants and secure written permission from the District if water from a District owned source is to be used.

3.8. PERMIT

The Owner shall not commence construction until the Permit is issued by the District. The Permit shall not be issued until after approval by the District of the Plans and Specifications, bond and insurance forms, grant of easement documents, and the deposit of the Inspection Fees and Liability Fees indicated in the Contract.

3.9. INSPECTION

All work shall be subject to inspection by the District. The Owner shall bear the costs of construction inspection. District will provide inspection during normal working hours, Monday through Friday, except District-observed holidays.

The Owner shall not proceed with any subsequent phase of work until the previous phase has been inspected and approved by the District and other public agencies having jurisdiction.

The District shall at all times have access to the work during construction and shall be furnished with every reasonable facility for ascertaining full knowledge of the progress, workmanship and character of materials used and employed in the work.

No pipe, fittings or other materials shall be installed until inspected and approved by the District. All installations which are to be backfilled shall be inspected and approved by the District prior to backfilling, and the Owner shall provide the District with two working days' notice in advance of backfilling.

The inspection of the work shall not relieve the Owner of any of their obligations to complete the Project as prescribed by the Contract. Defective work shall be made good, and unsuitable materials may be rejected notwithstanding the fact that such defective work and unsuitable materials have been previously overlooked by the District and accepted. The installation and inspection of unsuitable materials shall not be construed as acceptance by the District. Modifications to these specifications will only be made by the District in writing.

4. CONTROL OF MATERIAL

4.1. QUALITY OF MATERIALS

All equipment, materials and supplies to be incorporated in the Project shall be new unless otherwise specified and shall conform to the requirements stated in the Plans and Specifications approved by the District.

4.2. DEFECTIVE MATERIALS

All materials not conforming to the requirements of the approved Plans and Specifications shall be considered as defective and all such materials, whether in place or not, shall be rejected and shall be removed immediately from the site of the Project at the sole expense of the Owner, unless otherwise permitted by the District. No rejected materials, the defects of which have been subsequently corrected, shall be used until approved in writing by the District. Upon failure on the Part of the Owner to comply with any order of the District made under the provisions of this article, the District shall have authority to remove and replace defective material at the expense of the Owner.

4.3. STORAGE OF MATERIALS

All materials for use in the Project shall be stored by the Owner in such a manner as to prevent damage from exposure to the elements, admixture of foreign materials, or from any other cause. The Owner shall be fully responsible for any damage incurred to the materials for the Project while being stored, including damage resulting from storing of material in public right-of-way and District acquired easements. The Owner shall also be fully responsible for the preservation of public and private property while storing materials for the Project.

5. USE OF COMPLETED PORTIONS

When the Project or any portion of it is sufficiently complete to be utilized or placed into service, the District shall have the right upon written notification to the Owner to utilize such portions of the Project and to place the operable portions into service and to operate same. The Owner shall be required to notify his Surety to the same effect before the District uses any part of the Project.

Upon said notice and commencement of use or operation by the District, the Owner shall be relieved of the duty of maintaining the portions so used or placed into operation; provided however, that nothing in this article shall be construed as relieving the Owner of the full responsibility for completing the Project in its entirety, for making good defective work and materials, for protecting the Project from damage, and for being responsible for damage and such action shall not relieve the Owner, his surety, or insurers of the provisions of Section 7 INSURANCE REQUIREMENTS.

6. LEGAL RELATIONS AND RESPONSIBILITIES

6.1. OBSERVING LAWS AND ORDINANCES

The Owner shall be fully informed of all laws, ordinances, and regulations which in any manner affect those engaged or employed in the work or the materials used in the Project or which in any way affect the conduct of the work and of all such orders and decrees of bodies or tribunals having any jurisdiction or authority over same.

The Owner shall at all times observe and comply with and shall cause all their agents, employees, Contractor, subcontractors, and suppliers to observe and comply with all laws, ordinances, regulations, orders, and decrees, and shall hold harmless, indemnify, and defend the District, its consultants, and each of its directors, officers, employees, and agents from and against all claims, damages, losses, expenses, and other costs, including costs of defense and attorneys' fees, arising out of or resulting from the violation of any such law, ordinance, regulation, order, or decree by the Owner, Contractor, their employees, agents, subcontractors, or suppliers.

6.2. PERMITS AND LICENSES

The Owner shall procure all permits and licenses, pay all charges and fees, and give all notices necessary and incidental to the due and lawful prosecution of the work.

6.3. INVENTIONS, PATENTS, AND COPYRIGHTS

The Owner shall pay all royalties and assume all costs arising from the use of any invention, design, process, materials, equipment, product or device which is the subject of patent rights or copyrights.

The Owner shall hold harmless, indemnify and defend the District, and its consultants, and each of its directors, officers, employees and agents from and against all claims, damages, losses, expenses and other costs, including costs of defense and attorney's fees, arising out of any infringement of patent rights or copyrights incident to the use in the performance of the work or resulting from the incorporation in the Project of any invention, design, process, materials, equipment, product or device and shall defend all such claims in connection with any alleged infringement of such rights.

6.4. PUBLIC CONVENIENCE AND SAFETY

The Owner and their Contractor shall so conduct their operations as to offer the least possible obstruction and inconvenience to the public, and they shall have under construction no greater length or amount of work than can be prosecuted with due regard to the rights of the public.

Convenient access to driveways, houses and buildings along the line of work shall be maintained and temporary crossings shall be provided and maintained in good condition. Not more than one crossing or intersecting street or road shall be closed at any one time.

The Owner shall provide and maintain such fences, barriers, directional signs, lights and flag persons as are necessary to give adequate warning to the public at all times of any dangerous conditions to be encountered as a result of the construction work and to give directions to the public.

6.5. RESPONSIBILITY FOR LOSS, DAMAGE OR INJURIES

The Owner shall be responsible for all claims, demands or liability from any cause arising out of or resulting from or in connection with the performance of the work, excepting only those as may be caused solely and exclusively by the fault or negligence of the District, or its consultants, or its directors, officers, employees and agents. Such responsibility shall extend to claims, demands, or liability for loss, damage or injuries occurring after completion of the Project as well as during the progress of the work.

6.6. OWNER'S RESPONSIBILITY FOR THE PROJECT

Until acceptance of the Project, the Owner shall have the responsible charge and care of the Project and of the materials to be used therein (including materials which have been furnished by the District) and shall bear the risk of injury, loss or damage to any part thereof by the action of the elements or from any other cause, whether arising from the execution or from the non-execution of the Project.

The Owner shall rebuild, repair, restore and make good all injuries, losses or damages to any portion of the Project or the materials occasioned by any cause before its completion and acceptance and shall bear the expenses thereof. Where necessary to protect the Project or materials from damage, the Owner shall at his expense, provide suitable drainage and erect such temporary structures as are necessary to protect the Project or materials from damage. The suspension of work or the granting of an extension of time from any cause whatever shall not relieve the Owner of their responsibility for the Work and materials as herein specified.

6.7. PRESERVATION OF PROPERTY

The Owner shall exercise due care to avoid injury to existing improvements or facilities, utilities, adjacent property, and trees and shrubbery that are not to be removed.

All trees, shrubbery and landscaping that are not to be removed, and pole lines, fences, signs, survey markers and monuments, buildings and structures, conduits, pipelines under or above ground, sewer and waterlines, all highway or street facilities, and any other improvements or facilities within or adjacent to the Project shall be protected from injury or damage, and the Contractor shall provide and install suitable safeguards to protect such objects from injury or damage. If such objects are injured or damaged by reason of the Owner's operation, they shall be replaced or restored at the Owner's expense to a condition as good as when the Contractor entered upon the work or as good as required by the Plans and Specifications if any such objects are a part of the work being performed.

The fact that any such pipe or other underground facility is not shown on the Plans shall not relieve the Owner of their responsibility under this article.

In addition to any requirements imposed by Chapter 9, Part 1, Division 5, comprising Sections 6700 through 6719 of the Labor Code of the State of California, the Owner shall shore up, brace, underpin and protect as may be necessary, all foundations and other parts of all existing structures adjacent to and adjoining the site of the work which are in any way

affected by the excavations or other operations connected with the performance of the work. Whenever any notice is required to be given by the Owner to any adjacent or adjoining landowner or other party before commencement of any work, such notice shall be given by the Owner.

6.8. SAFETY

The Owner and/or the Contractor shall be solely and completely responsible for conditions of the jobsite, including safety of all persons and property during performance of the work, and the Owner and the Contractor shall fully comply with all state, federal and other laws, rules, regulations and orders relating to safety of the public and workers.

The right of the District to conduct construction review or observation of the work will not include review or observation of the adequacy of the Owner's and/or the Contractor's safety measures in, on or near the construction site.

6.9. PERSONAL LIABILITY

Neither the District, its consultants, nor any of the foregoing directors, officers, employees, or agents shall be personally responsible for any liability arising under or by virtue of the Contract.

6.10. INDEMNITY

To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the District, and its consultants, and each of its directors, officers, agents and employees from and against all claims, damages, losses, expenses and other costs, including costs of defense and attorney's fees, arising out of or resulting from or in connection with the performance of the work, both on and off the jobsite, provided that any of the foregoing (1) is attributable to personal injury, bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the work itself), including the loss of use resulting therefrom and (2) is caused in whole or in part by any act or omission of the Owner, Contractor, any subcontractor, any supplier, anyone directly or indirectly employed by any of them or anyone for whose acts or omissions any of them may be liable, regardless of whether or not it is caused in part by any act or omission (active, passive or comparative negligence included), of a party indemnified hereunder.

In any and all claims against the indemnified parties by any employee of the Owner, the Contractor, any subcontractor, any supplier, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the indemnification obligation under the first and third paragraphs in this article on INDEMNITY shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for the Owner, Contractor, or any subcontractor, or any supplier or other person under workers' compensation acts, disability benefit acts or other employee acts.

The Owner shall also indemnify and hold harmless the District, and its consultants, and each of its directors, officers, employees and agents from and against all losses, expenses,

damages (including damages to the Project itself), attorney's fees and other costs, including all costs of defense, which any of them may incur with respect to the failure, neglect, or refusal of Owner to faithfully complete the Project and all of the Owner's obligations under the Contract. Such costs, expenses and damages shall include all cost, including attorney's fees, incurred by the indemnified parties in any lawsuit to which they are a party.

6.11. WARRANTY OF TITLE

No materials, supplies, or equipment for the Project shall be purchased subject to any chattel mortgage or under a conditional sales contract or other agreement by which an interest therein or any part thereof is retained by the seller or supplier. The Owner warrants clear and good title to all materials, supplies and equipment installed and incorporated in the Project and agrees upon completion of all work to deliver the premises together with all improvements and appurtenances constructed or placed thereon to the District free from any claims, liens, encumbrances or charges and further agrees that neither they nor any person, firm or corporation furnishing any material or labor for Project shall have any right to a lien upon the premises or any improvement or appurtenances thereon, provided that this shall not preclude the Owner from installing metering devices or other equipment of utility companies or of municipalities, the title of which is commonly retained by the utility company or the municipality.

6.12. TERMINATION FOR BREACH

If the Owner refuses or fails to prosecute the Project or any separable part thereof with such diligence as will ensure its completion within the time specified in the Permit, or any extension thereof, or fails to complete the Project within such time, or if the Owner should be adjudged a bankrupt, or should make a general assignment for the benefit of their creditors, or if a receiver should be appointed on account of their insolvency, or if they or any of their Contractors should violate any of the provisions of the Permit, the District may serve written notice upon the Owner and their Surety of its intention to terminate the Permit, said notice to contain the reasons for such intention to terminate the Permit, and unless within ten (10) days after the service of such notice such violations shall cease and satisfactory arrangements for the corrections thereof be made, the Permit shall, upon the expiration of said ten (10) days, cease and terminate.

In the event of any such termination, the District shall immediately serve written notice thereof upon the Surety and the Owner. The Surety shall have the right to take over and perform the Contract, providing, however, that if the Surety within fifteen (15) days after the serving upon it of a notice of termination does not give the District written notice of its intention to take over and perform the Contract, or does not commence performance thereof within thirty (30) days from the date of serving said notice, the District may take over the Project to the extent permitted by law and prosecute the same to completion by contract or by any other method it may deem advisable for the account of and at the expense of the Owner, and the their Surety shall be liable to the District for any excess cost or other damage occasioned the District hereby, and in such event the District may, without liability for so doing, take possession of and utilize in completing the Project such materials, appliances, plants and

other property belonging to the Owner that may be on the site of the Project and be necessary therefor.

The foregoing provisions are in addition to and not in limitation of any other rights or remedies available to the District.

6.13. NOTICE AND SERVICE THEREOF

Any notice required or given under the Contract shall be in writing, be dated and signed by the party giving such notice or their duly authorized representative, and be served as follows:

(1) If to the District, by personal delivery or by deposit in the United State mail.

(2) If to the Owner, by personal delivery to the Owner or to their authorized representative at the site of the project or by deposit in the United States mail.

(3) If to the Surety or any other person, by personal delivery to said Surety or other person or by deposit in the United States mail.

(4) All mailed notices shall be in sealed envelopes, shall be sent by certified mail with postage prepaid and shall be addressed to the addresses in the Contract and/or noted on the bond and insurance forms or such substitute addresses which a party designates in writing and serves as set forth herein.

6.14. WARRANTY AND GUARANTEES

All work shall be warranted by the Owner against defective workmanship and materials for a period of one (1) year from the date the work is accepted by the District. Owner, at Owner's expense, shall replace or repair any such defective work in a manner satisfactory to the District whether repairs are completed within said period so long as the Owner is notified of the necessity of repairs during the period. In the event of failure to comply with the above mentioned conditions, the District is hereby authorized to proceed to have the defects repaired and made good at the expense of the Owner, who hereby agrees to pay the cost of charges therefore immediately upon demand.

The performance bond, the payment bond, and/or the guarantee bond shall continue in full force and effect until the system has been accepted. Bonds are to be submitted on surety company forms and are subject to approval by the District's Counsel.

This article does not in any way limit the warranty/guarantee on any items for which a longer warranty/guarantee is provided by a manufacturer or supplier. The Owner shall furnish the District all appropriate guarantee or warranty certificates upon completion of the project. No warranty/guarantee period whether provided for in this article or elsewhere shall in any way limit the liability of Owner or his Surety or insurers under the indemnity or insurance provisions of these General Provisions.

7. INSURANCE REQUIREMENTS

7.1. GENERAL

Construction shall not commence or continue until and unless there is in full force and effect all required insurance. The Owner shall not permit the Contractor to perform work on the Project unless the Workers' Compensation Insurance requirements have been complied with.

The types of insurance the Owner shall obtain and maintain are Worker's Compensation Insurance and Liability Insurance, all as set forth herein.

Workers' Compensation Insurance and Liability Insurance shall be maintained in effect for the full warranty/guarantee period.

Insurers must be authorized to do business and have an agent for service of process in California and have an "A" policyholder's rating and a financial rating of at least Class XI in accordance with the most current A.M. Best's Rating.

As evidence of specified insurance coverage, the Owner shall provide certificates of insurance and endorsements to the District.

7.2. WORKERS' COMPENSATION INSURANCE

The Owner shall provide a certificate(s) of insurance certifying that the Contractor has obtained for the period of the Contract full Workers' Compensation Insurance coverage for all persons whom they employ or may employ in carrying out the work under the Contract. This insurance shall be in strict accordance with the requirements of the most current and applicable State Workers' Compensation Insurance Laws.

7.3. LIABILITY INSURANCE

The Owner shall provide a certificate(s) of insurance showing that their Contractor has Liability Insurance coverage as stated in the Contract.

Included in such insurance shall be contractual coverage sufficiently broad to insure the matters set forth in Article 6-10, entitled "INDEMNITY".

Included in such insurance shall be a "Cross Liability" or "Severability of Interest" clause. The Liability Insurance coverage shall include each of the following types of insurance:

A. General Liability

(1) Comprehensive Form

(2) Premises-Operations

(3) Explosion and Collapse Hazard

(4) Underground Hazard

(5) Products/Completed Operations Hazard

(6) Contractual Insurance

(7) Broad Form Property Damage Including Completed Operations

(8) Independent Contractors

(9) Personal Injury

B. Automobile Liability

(1) Comprehensive Form Including Loading and Unloading

(2) Owned

(3) Hired

(4) Non-Owned

The Liability Insurance shall include as additional insureds: the District, and its consultants, and each of its directors, officers, agents and employees. The insurance afforded to these additional insureds shall be primary insurance. If the additional insureds have other insurance which might be applicable to any loss, the amount of the insurance provided under this article on LIABILITY INSURANCE shall not be reduced or prorated by the existence of such other insurance.

8. CONSTRUCTION SECURITY

8.1. GENERAL

Payment Bond, Performance Bond, and/or Guarantee Bond, if required by District, shall be secured from a surety company or companies, satisfactory to the District and whose name is on file with the County Clerk of Los Angeles County as an approved and financially sound surety company, authorized to transact business in the state of California. Refer to Appendix A, the Contract for Acquisition and Construction of Water System Improvements.

The bonds shall meet all of the requirements and contain all of the conditions required by Chapter7, Part 4, Division 3, comprising Section 3247, et. seq., of the Civil Code of the State of California. The bonds shall be delivered to the District prior to issuance of the Permit.

The Owner shall submit copies of proposals received from contractor(s) bidding on construction of the improvements or other evidence satisfactory to the District, to establish the Project construction costs for purposes of bonding.

8.2. PERFORMANCE BOND

The Owner shall furnish a performance bond in the amount of one hundred percent (100%) of the Project construction cost to the benefit of the District, as security for the faithful performance of the Work in compliance with the District ordinances, Rules and Regulations, and the Plans and Specifications.

8.3. PAYMENT BOND

The Owner shall furnish a separate bond in an amount at least equal to fifty percent (50%) of the Project construction cost to the benefit of the District, as security for the payment of all persons performing labor and furnishing materials in connection with the Project.

9. FINAL ACCEPTANCE OF THE PROJECT BY THE DISTRICT

Following final testing and inspection of the facilities constructed under the Contract, and, if applicable, after payment to the District for that portion of the District's plan check, inspection costs, engineering, legal and administrative, exceeding the sums previously deposited with the District to cover such costs, the District will accept, in writing, from the Owner the completed facilities as described in the Contract.

All Facilities connected to the District's distribution system shall be donated by the Owner to the District free and clear of all liens, claims and encumbrances and shall become the property of District upon acceptance of the Facilities for operation, maintenance, and repair by the District. District may require Owner to provide a deed, bill of sale, or other instrument of conveyance, conveying the Facilities from the Owner to the District.

WATER SYSTEM DESIGN CRITERIA

WATER DEMANDS

The water systems shall be designed based on the following domestic plus fire flow demands:

Residential – Domestic (assumes 3.5 persons per dwelling unit)

Average Day	250 gpd per capita
Maximum Day	250% of average day demand
Peak Hour	350% of average day demand

Commercial (non-residential) and Industrial

Developer to submit design flow assumptions to the District for review. Minimum shall be equivalent to five (5) residential connections per acre.

Fire Flow

The fire flow requirements shall be determined by the Los Angeles County Fire Department.

PIPELINE SYSTEM DESIGN CRITERIA

All design shall be completed in accordance with the District Specifications and the California Waterworks Standards. In case of conflict between the standards, the more restrictive standard shall apply. Materials used in the water system must comply with the NSF-61 certification requirements of the California Waterworks Standards - Section 64591.

The minimum pipe size for water mains shall be 8-inches in diameter unless specific approval is given by the District for a lesser diameter. In any case, no main shall be smaller than 6-inches in diameter. All line sizing shall be based on maximum day demand plus fire flow or peak hour, whichever is greater and a maximum pipeline velocity of 5 feet per second. Pipeline pressure losses will be calculated using Hazen-Williams formula and a C factor of 130.

Minimum cover over the top of pipe shall be three feet below finish grade. In locations where, in the District's opinion, three feet of cover is insufficient, the District may require more than three feet of cover, or the use of special materials and/or installation methods. Water mains shall normally be located in the roadway 8 feet from the curb face.

As a general rule, there shall be three valves on tees and four valves on crosses. On long blocks, intermediate valves should be installed so that not more than 600 feet of line will have to be shut off at any one time. Valves shall be joined to fittings by flanges or mechanical joints. When water mains are in easements outside traveled streets, a valve shall be located at each end of the easement.

The final determination of the number of valves and the locations shall be approved by the District. Combination air valves or other means to allow air to enter and leave a pipeline shall be installed at all high points in a line as directed by the District. The inlet to each air valve shall be provided with an isolation valve to provide a positive closure between the main pipeline and the air and vacuum release valve. The air and vacuum release valve vent shall be installed above ground in such a manner as to preclude backflow. (See Standard Detail W-6.)

Blow-offs shall be installed at ends of mains and at low points where sediment may settle in the line.

Distribution system improvements required to serve a project or development which will be dedicated to the District shall have at least two connections to waterlines in different streets to form a looped water system. Non-looped systems will be permitted only with the written permission of the District.

Water pipelines shall be constructed of PVC pipe per the Standard Specification contained herein. Fittings shall be ductile iron conforming to the Standard Specification contained herein.

Install 14-gauge insulated solid copper locator wire along pipeline from valve to valve.

Existing services connected to water lines which are being replaced shall be replaced with new services conforming to the Standard Specifications contained herein.

Separation of parallel or perpendicular water mains and sanitary sewers shall conform to the standards contained in Section 64572 of Article 4, Chapter 16, of Title 22 of the California Administrative Code which is included in these specifications by reference.

END OF SECTION

STANDARD SPECIFICATIONS FOR EARTHWORK

A GENERAL DESCRIPTION

Earthwork shall consist of performing operations necessary to complete all excavation, preparation of subgrade, ditching, structural excavation, trenching, backfill compacting, sloping, trimming the subgrade, and finish grading; as shown on the Plans or contained in the Specifications. The Contractor shall furnish all labor, material, tools and equipment necessary for earthwork operations and perform all incidental work thereto as required.

Earthwork shall include all clearing and grubbing, removal and disposal of paving, removal of water, excavation of all classes of earth and rock regardless of character and subsurface conditions and disposal of all excess excavation.

A-1 SCOPE OF WORK

The work includes furnishing all services, labor, materials, and equipment and perform all operations in connection with all earthwork necessary for the construction of the improvements as indicated on the Plans and in the Specifications. Excavation shall include the removal of water and all material of whatever nature and shall include clearing of sites for construction.

A-2 EARTHWORK IN STATE AND COUNTY RIGHTS-OF WAY

Earthwork within the rights-of-way of the State of California, Department of Transportation and the County Public Works Department shall be performed in accordance with requirements and provisions of the permits issued by those agencies for the construction within their respective rights-of-way. Where there is a conflict between the District's specifications and those of the State or County, the more stringent requirements and provisions shall take precedence.

A-3 SAFETY PRECAUTIONS

All excavations shall be performed, protected and supported as required for safety and in the manner set forth in the operating rules, orders and regulations prescribed by the Division of Industrial Safety of the State of California. Barriers shall be placed at each end of all excavations and at such places as may be necessary along excavations to warn all pedestrian and vehicular traffic of such excavations.

A-4 BRACING EXCAVATIONS

All excavations shall be properly supported in the manner prescribed by the rules, orders and regulation of the Division of Industrial Safety of the State of California. Excavations shall be so braced, sheeted and supported that they will be safe and the ground alongside the excavation will not slide or settle, and all existing improvements of any kind, either on public or private property, will be fully protected from damage. If any damage does result to such improvements, the Contractor, at his own expense, shall make the necessary repairs or reconstruction required as directed by the District.

Excavations shall be so braced or sheeted so as to provide conditions under which workmen may work safely and efficiently at all time. The sheeting, shoring, and bracing shall be arranged so as not to place any stress on portions of the completed work until the general construction thereof has proceeded far enough to provide ample strength. Any damage to structures occurring through settlements, water or earth pressures, slides, caves or other causes due to failure or lack of sheeting or bracing or improper bracing or through negligence or fault of the Contractor in any other manner, shall be repaired by the Contractor at his own expense.

Where timber sheeting extends below the invert of the pipe, it shall be cut off at the top of the pipe and the upper portion removed without harming the support conditions. This requirement will not be necessary where steel sheeting is used for shoring below the invert of the pipe.

Care shall be exercised in the drawing or removing of sheeting, shoring, bracing and timbering to prevent the caving or collapsing of the excavation faces which are being supported.

A-5 OPEN EXCAVATIONS AND STOCKPILING

Open excavations and stockpiling shall be constructed in a manner to prevent water running into excavations. Obstruction of surface drainage shall be avoided and means shall be provided

Whereby storm and wastewater can flow uninterruptedly in existing or established flowage courses, other surface drains or temporary drains. Material for backfill or for protection of excavation in public roads from surface drainage shall be neatly placed and kept shaped so as to cause the least possible interference with public travel. Free access must be provided to all fire hydrants, water valves, meters, private drives, roads or existing access routes.

A-6 SELECTED MATERIAL FOR PIPE BEDDING AND PIPE ZONE

Selected material for pipe bedding and pipe zone backfill shall be selected native material free from clods, sticks, vegetation, chunks of asphalt paving, or other deleterious materials and shall be free of rocks or stones which are larger than 3/4 inch in greatest dimension. Use of selected native material for pipe bedding and pipe zone will only be as allowed by the District.

A-7 SAND FOR PIPE BEDDING AND PIPE ZONE

Sand for pipe bedding and/or pipe zone shall be free from foreign materials such as rocks, sticks, vegetation, etc., and shall meet the following gradation:

Sieve Size	Percent Passing Sieves
3/8 Inch	100
No. 4	75-100
No 30	12-50
No. 100	5-20
No. 200	0-10

A-8 AGGREGATE FOR PIPE BEDDING FOUNDATION

If aggregate is required for pipe bedding foundation, it shall be No. 67 crushed rock as defined by ASTM D 448 and shall be free from foreign and organic matter.

A-9 OBSTRUCTIONS

All underground improvements shall be preserved and protected. Where it is necessary to remove and replace or to relocate such improvements in order to prosecute the work, they shall be removed, maintained in operation, and permanently replaced as directed by the owner of the discovered obstruction or as directed by the District.

A-10 COMPACTION TESTS

Compaction tests will be made by the testing laboratory designated by the District. The number of tests and their location and depth shall be determined by the District. Relative Compaction specified herein shall be a percentage of the maximum dry density as determined by ASTM D1557 (5 layer only). Compaction tests shall be taken in accordance with ASTM D1556 or ASTM D6938 as approved by the District.

Backfill of excavation within the right-of-way of county streets and State highways shall be performed in accordance with the requirement and to the satisfaction of the County Public Works Department or the Division of Highways. Where a conflict exists between the District's requirement and those of either the County or the state, the more stringent requirement shall apply.

The costs of compaction testing shall be included in the inspection costs to be reimbursed to the District by the Owner.

A-11 CORRECTION OF FAULTY GRADES

Where excavation is inadvertently carried below subgrade and/or foundation elevations, suitable provision shall be made for adjustment of the subgrade. The subgrade or foundation shall be restored to a condition similar to the condition existing prior to the over-excavation and by means acceptable to the District.

A-12 CLEARING AND GRUBBING

The Contractor shall perform all required clearing and grubbing and the disposal of all trees, brush, roots and other perishable and objectionable material.

The ground surface of all areas where material is to be excavated or where embankments, stockpiles, fills or structure are to be placed shall be cleared of all vegetation and rubbish, and all brush roots and tree roots shall be grubbed and removed from such areas. All cleared and grubbed areas shall be maintained free from vegetable growth.

Organic material from clearing and grubbing operations will not be incorporated in pipe backfill.

A-13 BLASTING AND EXPLOSIVES

Provide written notice to the District, accompanied by copies of all executed permits from the appropriate regulating bodies, related to the use of explosives at any improvement site. Written permission of the District shall be obtained prior to any blasting or use of explosives. Explosives, if used, shall be of such quantity and power and shall be used in such locations so as to minimize opening of seams and disturbing of the material outside the prescribed limits of excavation. As excavation approaches its final limits, the depths of holes for blasting and the quantity of explosives used for each hole shall be reduced so that the underlying or adjacent material will be disturbed or shattered as little as possible.

Extreme care shall be exercised when blasting in the vicinity of existing structures, utilities or construction facilities of others.

All blasting shall be performed in conformance with the provisions of the Safety Orders of the California Department of Industrial Relations.

A-14 DEWATERING

There shall be provided and maintained at all times during construction ample means and devices with which to promptly remove and properly dispose of all water from any source entering the excavations or other parts of the work. Dewatering shall be accomplished by methods which will ensure a dry excavation and preservation of the final lines and grades of the bottoms of excavations. Said methods may include well points, sump pumps, suitable rock or gravel placed below the required bedding for drainage and pumping purposes, temporary pipelines and other means, all subject to the approval of the District.

Dewatering for structures and pipelines shall commence when groundwater is first encountered and shall be continuous until such times as water can be allowed to rise in accordance with the provisions of this section. No concrete footings or floors shall be laid in water nor shall water be allowed to rise over them until the concrete or mortar has set at least eight hours. Water shall not be allowed to rise unequally against walls for a period of 28 days.

The water from the work shall be disposed of in a suitable manner without damage to adjacent property. No water shall be drained into the work under construction without prior consent of the District. Water shall be disposed of in such a manner as not to be a menace to the public health.

B PIPELINE AND TRENCH EARTHWORK

B-1 GENERAL

Work in connection with pipeline and trench earthwork shall include but not be limited to any or all of the following described operations: clearing; excavation of all classes and of whatever substance encountered; backfilling; fine grading; preparation of right-of-way; subgrades for pipe and structures; and paving and performing any other similar, incidental, or appurtenant earthwork operation which may be necessary to properly complete the work indicated.

B-2 EXCAVATION FOR PIPE TRENCHES

Trenches for pipelines shall be excavated to the lines and grades shown on the Plans, as provided in the Specifications.

B-3 TRENCH WIDTH

The overall trench width shall be at least 12 inches (but no more than 16 inches) wider than the largest outside diameter of the pipe to be laid therein measured at a point 12 inches above the top of the pipe. Excavating and retrenching shall be true to line so that a clear space of not more than 8 inches or less than 6 inches in width is provided on each side of the largest outside diameter of the pipe in place. For the purpose of this article the largest outside diameter shall be the outside diameter of the bell, on bell and spigot pipe, and outside diameter of coupling for sleeve coupling pipe.

Where the trench width, measured at a point 6 inches above the top of the bell or sleeve the pipe is wider than the maximum set forth above, the trench area around the pipe shall be reworked to restore a trench condition and provide load factor acceptable to the District.

The reworking may result in one or more of the following operations, subject to the approval of the District: (1) Shaping the bottom of the trench to fit the pipe; (2) Placing sand around the pipe and to a point 6 inches above the top of the pipe; (3) Lowering the grade of the pipe until the trench condition can be met; (4) Installing a concrete cradle for the pipe: and (5) Providing concrete encasement for the pipe to a point 3 inches above the top of the pipe.

B-4 LIMIT OF EXCAVATION

Trench excavation shall proceed in advance of the pipe installation only as far as can be backfilled the same day. Except by special permission of the District, the maximum length of open trench shall not exceed 600 feet in the aggregate at any one location including excavation, construction, pipe laying and backfilling. In addition, at locations where access may be somewhat limited, requiring rerouting of traffic unnecessarily, the District may reduce the maximum length of open trench permitted.

B-5 TRENCH BOTTOM FOR PIPE

The trench bottom shall be graded to provide a smooth, firm foundation at every point throughout the length of the pipe.

Grade the bottom of the trench to the line and grade to which the pipe is to be laid, with allowance for pipe thickness. Remove hard spots that would prevent a uniform thickness of bedding. Place pipe base material over the full width of the trench to a depth of 3 inches thick for pipe with diameters smaller than 4 inches, 4 inches thick for pipe 4 through16 inches in diameter and 6 inches thick for pipe 18 inches in diameter and larger. Grade the top of the pipe base ahead of the pipe laying to provide firm, continuous, uniform support along the full length of pipe, and compact to the relative compaction specified herein. Before laying each section of the pipe, check the grade and correct any irregularities. The bedding material so prepared shall meet the requirements of Section A-6 and A-7 of these specifications.

If it becomes necessary to excavate below the established grade line in order to remove boulders or other interfering objects, the voids shall be filled with material meeting Section A-6 or A-7 requirements (as approved by the District) densified in the manner specified for bedding materials.

Where excavation is in rock, hardpan, shale, or other similar hard and unyielding material, the trench shall be excavated to a depth at least 6 inches below the established grade line of the outside bottom of the pipe and filled with material as specified in Section A-6 or A-7 (as approved by the District) to grade line. The subgrade shall then be completed as previously stated. The material so placed shall be compacted to 90% relative compaction.

At each joint in the pipe, the bottom of the trench shall be recessed in such a manner as to relieve the bell of the pipe or the pipe coupling of all load and to ensure continuous bearing along the pipe barrel upon the bedding material.

B-6 TRENCH BACKFILL

All trenches shall be backfilled after pipe, fittings and appurtenances have been installed. Whenever a relative compaction requirement value is specified, it shall be a percentage of the maximum density as determined hereafter. Optimum moisture content and maximum density shall be determined in accordance with ASTM D 1557 and density of soil in place shall be determined using methods approved by the District.

All wood and waste material shall be removed from excavation preparatory to backfilling. Backfill material shall be approved in all cases by the District and shall be free of trash, wood, large rock, or other objectionable debris. Backfilling shall include the refilling and compaction of the fill in trenches of excavations up to the subgrade of the street or to the existing ground surface.

B-7 PIPE BEDDING

The pipe shall be carefully bedded during initial pipe zone backfill operations by hand placing, slicing with a shovel and tamping or "walking in" the material under the lower sector of the pipe to produce firm support for the full length of the barrel with full bearing on said bottom segment of the pipe equal to a minimum of five-tenths of the outside diameter of the barrel.

B-8 BACKFILL PROCEDURE AT PIPE ZONE

Subsequent backfill in the pipe zone shall consist of placing material as required in these specifications simultaneously on each side of the pipe for the full width of the trench and compacting said material to a relative compaction of 90% within the limits of the pipe zone. The pipe zone begins at the bottom of the pipe barrel and extends to a horizontal plane 12 inches above the top of the outside diameter of the pipe.

The pipe shall be carefully bedded by hand placing and compacting selected backfill material or clean imported sand as provided herein from to backfilling above the pipe within the "pipe zone." Clean imported sand shall be used for the pipe bedding when excavated materials are not suitable for pipe bedding or where required by the Plans.

The pipe bedding, using either selected material or clean imported sand, shall be compacted by approved methods to a relative compaction of 90%. The pipe bedding backfill shall be brought to optimum moisture content and shall be placed in layers not exceeding 6 inches in thickness and each layer shall be solidly tamped with the proper tools so as not to injure, damage or disturb the pipe. Backfilling shall be carried on simultaneously on each side of the pipe to assure proper protection of the pipe.

Water settling for compaction may be approved by the District in the event the foundation and bedding materials are sufficiently granular and sandy in nature that the required compaction will be obtained. Where pipe is not very deep and the pipe zone extends into the street zone that portion of the pipe zone within the street zone shall be compacted as set forth in Section B-11 of these specifications.

B-9 BACKFILL PROCEDURE AT TRENCH ZONE (ABOVE PIPE ZONE)

The remaining portion of the trench to within 2-1/2 feet of the finished roadway surface or ground surface, as the case may be, shall be backfilled, compacted and/or consolidated to obtain a relative compaction of 90%. Backfilling may be performed with native material except that no oil cake, bituminous pavement, concrete, rock or other lumpy material shall be used in the backfill, unless these materials are scattered and do not exceed 3 inches in any dimension.

Material of perishable, spongy, or otherwise improper nature shall not be used in backfilling and no material greater that 3 inches in any dimension shall be placed within l foot of any pipe, manhole or structure.

B-10 COMPACTION IN OPEN FIELDS

In open fields, where paving or structures will not be above the excavated area, backfill and compaction as specified in Section B-9 hereinbefore shall extend to the top of the trench, leaving the top slightly mounded.

B-11 BACKFILL PROCEDURE IN STREET ZONE

The top 2-1/2 feet of the trench within roadbed areas shall be compacted in horizontal layers not exceeding 8 inches in thickness using approved hand, pneumatic or mechanical type tampers to obtain a relative compaction of 95% or as required by the governing agency with a moisture content within 2% of optimum. Flooding and jetting will not be permitted within roadbed areas. Compaction requirements in the street zone may be modified by the backfill requirements of other government agencies in areas where the agencies have jurisdiction.

The roadbed area as used herein shall be considered as extending two feet beyond the curbs, gutters or paved shoulders.

From existing street grade to 2-1/2 feet below street grade, the material for backfill may contain stones ranging in size up to 2 inches in diameter in quantity, but not exceeding 20% of the volume where said coarse materials are well distributed throughout the finer material and the specified compaction can be obtained.

B-12 EXCESS EXCAVATED MATERIAL

All surplus material not required for backfill shall be disposed of by the Contractor outside the limits of the public rights-of-way and/or easements.

No excavated material shall be deposited on private property, unless written permission is secured by the Owner. Before the District will accept the work as being completed, the Owner shall file a written release signed by all property owners with whom the Owner has entered into agreements for disposal of excess excavated material. The release shall absolve the District from any liability connected therewith.

B-13 IMPORTED PIPE BACKFILL MATERIAL

Whenever the excavated material is not suitable for backfill, as determined by the District, the Contractor shall arrange for and furnish suitable imported material.

C STRUCTURES EARTHWORK

C-1 GENERAL

Structure excavation shall include the removal of all material of whatever nature necessary for the construction of structures and foundations required.

The sides of excavations for structures where all vertical surfaces are formed shall be sufficient to leave at least 2 feet in the clear as measured from the extreme outside of formwork or structure, as the case may be. Where excavation is inadvertently carried below designated elevations, suitable provision shall be made for adjustment of construction, as directed by the District, to meet requirements incurred by the deeper excavation beneath structures, and over depth excavation in such locations shall be rectified by backfilling with sand, graded gravel, or concrete as directed by the District. All over depth excavation for footings shall be backfilled with Class C concrete, as defined in the Technical Specification for Concrete Construction.

C-2 SUBBASE FOR STRUCTURES

Where indicated on the Plans, a crushed rock subbase shall extend from firm ground undisturbed by the construction operations to the structure base slab for all concrete structures. Any remaining disturbed or loose material shall be removed before the crushed rock subbase is placed. The subbase shall be compacted to the specified compaction, 90% minimum, or as approved by the District by means of a vibratory roller.

C-3 SUBBASE MATERIALS

Mineral aggregate shall be free of clay balls, organic matter and other deleterious materials and conform with the following gradation requirements:

Sieve Size	Percent Passing Sieves
3/4 Inch	90-100
No. 4	40-60
No 30	13-23
No. 200	0-2

After compaction of foundation footings and walls of the structure and of construction below the elevation of the final grade and prior to backfilling, all forms shall be removed, and the excavation shall be cleared of debris. Backfilling shall not be commenced until the structure and excavation involved shall have been inspected and approved by the District.

Material for backfilling shall consist of selected excavation material, imported sand, gravel or other material approved by the District and shall be free of trash, lumber or other debris. No

material of a perishable or spongy nature and no stone or piece of rock greater than four inches in greatest dimension shall be used in backfilling.

Compaction shall be obtained by means of mechanical tamping. Backfill of excavated material shall be placed in horizontal layers not exceeding 8 inches in thickness and shall have a moisture content such that the required degree of compaction may be obtained. Each layer shall be compacted by hand, mechanical tampers or other suitable equipment or means to the specified relative compaction.

Where backfill or fill is against only one side of a concrete structure, no fill shall be placed until the concrete in place has obtained an acceptable seven-day strength based upon a concrete cylinder test, unless otherwise directed by the District.

Particular care shall be exercised when backfilling at various structures to obtain adequate compaction beneath pipes connected thereto and to avoid injury or displacement of such pipes or projections of the structures.

STANDARD SPECIFICATIONS FOR POLYVINYL CHLORIDE WATER PIPE

A PIPE

A-1 CLASSIFICATION

Polyvinyl chloride (PVC) pipe shall be manufactured for use in potable water service and shall conform to a minimum of Class 235 (DR-18) as described in AWWA C900.

A-2 SIZE

This specification covers PVC pipe with nominal diameters not exceeding 12-inches. If larger diameter pipe is required, PVC conforming to AWWA C905 may be used if approved by the District.

A-3 JOINTS

Only elastomeric gasket jointed PVC pipe shall be used. Either the integral bell design or the separate sleeve-type coupling joint may be used. Gaskets shall meet the requirement of AWWA C900. Oil resistant gaskets may be required in some instances by the District. PVC pipe may not be used in areas subject to contamination by petroleum distillates.

A-4 MARKING

Each standard length of PVC pipe, and each coupling if separate sleeve-type couplings are used, shall be clearly marked at intervals of not more than 5 ft. by the manufacturer with the following information:

1. Nominal diameter
2. O.D. base (Cast iron O.D. base is required)
3. Material code (PVC 1120)
4. Dimension ratio (DR) number
5. AWWA C900
6. Manufacturer's name
7. Seal of testing agency that verified suitability of pipe material for potable water service.

A-5 TEMPORARY STORAGE OF PIPE

If pipe is stored at a project site, it shall not be stacked higher than four feet and no weight shall be placed on bells or couplings. Stored pipe shall be covered to protect it from ultraviolet light (sun's

rays). PVC pipe with noticeable color changes resulting from exposure to ultraviolet light may be rejected at the discretion of the District.

B FITTINGS

Fittings joining to PVC pipe shall be ductile iron and shall be selected to match the dimensions of the PVC pipe (cast iron outside diameter) without the use of oversize gaskets. Mechanical joint (M.J.) fittings conforming to AWWA C110 and C111 shall be used. Fittings shall be joined to valves by flanges. Valves shall be joined to PVC pipe using restrained Flange x M.J. adapters. Mechanical joint fittings conforming to AWWA C153 may be used in lieu of AWWA C110 fittings.

Gaskets for mechanical joints shall conform to AWWA C111.

Fittings shall be mechanical joint, suitable for direct connection to the mating PVC pipe except when connecting to a valve.

Flanges shall conform to the bolt circle and bolt hole dimensions for flanges in AWWA C110. Gaskets for flanged joints shall be non-asbestos, 1/16-inch thick, and full face or drop in style conforming to the dimensions for flanges in AWWA C110.

Nuts and bolts for bolting flanged joints shall be standard hexagonal head machine bolts and hexagonal nuts conforming to the requirements of ASTM A-307, Grade B, zinc plated per ASTM B633 or ASTM F1941. All bolts shall be lubricated with graphite and oil. Flanged faces shall be wire brushed and cleaned prior to joining each flange.

Nuts and bolts for all buried fittings and valves shall be coated according to the Standard Specifications. All buried fittings and valves shall be wrapped in polyethylene film per the Standard Specifications herein.

Provide cement mortar lined fittings per AWWA C104. Lining thickness shall be the double thickness listed in AWWA C104 Section 4.8. Cement lining shall conform to ASTM C150, Type II. Alternatively, line and coat fittings with 12 mils minimum of fusion bonded epoxy.

C INSTALLATION

Trenching, bedding of PVC pipe, and backfilling of trenches shall conform to the Standard Specification for Earthwork.

Unless a separate sleeve-type coupling jointed pipe is used, the manufacturer of which recommends deflecting pipe at the joints to follow a curved alignment, deviations from a straight pipeline alignment shall be made only by use of ductile iron fittings. The pipe barrel shall not be bent to produce changes in alignment.

Fittings and valves shall be supported independently of the pipe. Five-foot lengths of pipe shall be used in and out of each fitting and valve and wherever pipe passes through a rigid structure.

Install a 14 gauge insulated solid copper locator wire along the top of the pipe from valve to valve. The wire shall be attached to the top of the pipe at each joint by an 8-inch length of duct

tape or other approved method. The wire shall be extended to the top of each valve box and a 3-foot length of wire shall be coiled at the top of the valve box riser.

Concrete thrust blocks shall be installed at the locations on the Plans and as shown in Standard Detail W-10 and shall consist of concrete containing not less than six sacks of Portland cement per cubic yard.

Concrete thrust blocks shall be placed between the undisturbed ground and the fittings to be anchored. The bearing area against undisturbed soil shall be as shown on the Plans. The concrete shall be so placed that the pipe joints and fittings will be accessible to repairs.

At times when pipe laying is not in progress, the open end of pipes shall be closed by a vermin-proof plug secured so as to discourage tampering.

D HYDROSTATIC TESTING AND DISINFECTION OF POTABLE WATER LINES

Installed pipe shall be tested and disinfected in accordance with the testing and disinfection Standard Specification.

END OF SECTION

STANDARD SPECIFICATIONS FOR DUCTILE IRON WATER PIPE

A PIPE

A-1 MATERIAL

Ductile iron pipe (DIP) used for water distribution systems shall be manufactured in accordance with AWWA C151 and cement mortar lined in conformance with AWWA C104.

A-2 WALL THICKNESS

The class of pipe used shall be determined by the procedures outlined in AWWA C150. Minimum internal design pressure shall be 150 psi plus an "anticipated surge pressure" of 100 psi.

A-4 PIPE END CONFIGURATIONS

Pipe end configurations (push-on, mechanical joint, restrained or flanged) shall be indicated on the Plans. Mechanical joints and push-on joints shall conform to the requirements of AWWA C111. Flanged joints shall conform to AWWA C115, if flanges are threaded, or to the flanged joint provisions of AWWA C110 if flanges are cast integrally with the pipe. Threaded flanges are to be used only on pipe spools shorter than a standard length of ductile iron pipe (18 feet or 20 feet) needed in special circumstances as shown on the Plans and approved by the District.

A-4 MARKING

Each joint of DIP shall be clearly marked with the following information by the pipe manufacturer: Weight Class (per AWWA C150) or nominal thickness; Casting period; Manufacturer's mark; Country where cast; Year cast; the letters "DI" or "DUCTILE"

B FITTINGS

Fittings shall be manufactured of ductile iron conforming to the requirements of AWWA C110 with a 350 psi pressure rating. All fittings shall be cement-mortar lined in accordance with AWWA C104.

Ductile iron fittings conforming to AWWA C153 ("compact fittings") may be used where restrained joint fittings and pipe are used to resist thrust instead of concrete thrust blocks, subject to approval by the District. "Compact fittings", if used, shall be cement mortar lined in accordance with AWWA C104.

Fitting ends shall be selected to match the end of the pipe joint, valve, or fitting to which it is to be joined. Requirements for fitting end configurations are outlined in AWWA C110 and C111 (refer to A-3, Pipe End Configurations). Fittings shall be flanged to valves.

Gaskets for mechanical joints shall conform to the requirements of AWWA C111.

Gaskets for flanged joints shall be non-asbestos, 1/16-inch thick, and full face or drop in style conforming to the dimensions for flanges in AWWA C110.

C INSTALLATION

Trenching, bedding of DIP, and backfilling of trenches shall conform to the Standard Specification for Earthwork. Curved alignments are allowable without the need for fittings provided the maximum deflection at a pipe joint does not exceed 5 degrees for pipe equal to or less than 12-inches in diameter or 3 degrees for pipe 14 through 18 inches in diameter (in no case shall deflections at pipe joints exceed manufacturer's recommendations). Deflecting pipe joints is allowable only for push-on or mechanical joint pipe.

All DIP shall be encased in polyethylene wrap per AWWA C105. Tape for securing the polyethylene wrap shall be 2-inch wide adhesive tape such as Polyken 900 (polyethylene), Scotchwrap 5 (polyvinyl) or equal as approved by the District. (Refer to Standard Specification for Plastic Film Wrap).

In addition to the tracer wire, detectable warning tape shall be placed above the pipe and tracer wire to alert workers to the presence of the pipe and/or tracer wire during future trenching operations. The tape shall be as noted on Standard Detail W-2. Tracer wire and/or warning tape shall be replaced if damaged by any subsequent trenching operation.

At times when pipe laying is not in progress, the open end of pipes shall be sealed temporarily to prevent the entry of water, debris, small animals, and similar types of contamination. Such temporary seals shall also be vermin-proof, and secured so as to discourage tampering.

D THRUST RESTRAINT

Thrust restraint for DIP may be provided by the use of concrete thrust blocks and/or restrained joints. Acceptable joint restraint devices include special joint designs that are standard products of domestic DIP manufacturers. If restrained joints are to be used, the Owner shall submit to the District, for review and approval, information of the type of joint proposed along with calculations for the number of joints of DIP to be restrained on each side of a fitting or valve. The type of joint and number of joints of DIP to be restrained at each location shall be shown on the Plans.

If concrete thrust blocks are to be used, they shall be called out on the Plans at each point needed. Thrust blocks shall be constructed of concrete containing six sacks of cement per cubic yard and placed between the fitting to be anchored and undisturbed earth. The bearing area against undisturbed earth shall be called out on the Plans at each location a thrust block is required. The concrete shall be placed so that pipe joints and fittings will be accessible for repairs.

E HYDROSTATIC TESTING AND DISINFECTION OF POTABLE WATER LINES

Installed pipe shall be tested and disinfected in accordance with the Testing and Disinfection of Water Pipe Standard Specification.

END OF SECTION

STANDARD SPECIFICATIONS FOR RESILIENT SEAT GATE VALVES

A GENERAL

These specifications designate the requirements for the furnishing and installation of resilient seat gate valves.

B MATERIALS AND WORKMANSHIP

B-1 GENERAL

Resilient seat gate valves shall conform to the requirements of AWWA C509 and the requirements set forth herein.

Resilient seat gate valves, unless otherwise indicated, shall be the same size as the main in which they are installed. All valves shall be of the bolted bonnet type with non-rising-stem, counterclockwise opening, with flanged ends. Valves are to have 2-inch square cast-iron operating nuts. Valves shall be marked with raised lettering cast on the body indicating manufacturer and working pressure. Minimum working water pressure to be 200 psig. All materials in contact with potable water shall be NSF61 certified and comply with California low lead requirements.

Valves shall be iron bodied, with wedge, disc, or gate fully encapsulated in resilient seating material. The bronze stem nut shall be solid bronze conforming to ASTM B62 (4-6% zinc). The bronze stem shall be cast bronze or forged bronze bar stock containing a maximum of 2% zinc. Valves shall be manufactured by Mueller, or approved equal.

B-2 INTERIOR COATING

The interior of the valve body shall be coated at the place of manufacture. Surfaces shall be sandblasted in accordance with SSPC-SP-5 (white metal blast cleaning). The interior coating shall consist of a minimum of 12 mils of fusion bonded epoxy.

B-3 EXTERIOR COATING

The exterior of the valve body shall be coated at the place of manufacture. Surfaces shall be sand blasted in accordance with SSPC-SP-10 (near white blast cleaning). The exterior coating shall be a high build epoxy or phenolic epoxy having a minimum solids volume of 80% (ASTM D2697), Devoe Bar-rust 233V, Tnemec L69F, Sherwin Williams Duraplate UHS B62 series or approved equal to minimum dry film thickness of 30 mils. The paint manufacturer's recommendations shall be followed.

B-4 VALVE BOXES

Valve box assemblies shall conform to the requirements shown on the Standard Detail W-7 for Valve Boxes.

B-5 VALVE ENDS

All valves shall have flanged ends, as noted in B-1 above, unless otherwise specified by the District.

B-6 GREASE APPLIED TO BURIED BOLTS

Apply rust preventative grease to bolts and nuts prior to film wrap and burial. Grease shall be “NO-OX-ID ‘A-SPECIAL’” by Sanchem Inc. Apply per manufacturer’s instructions.

B-7 PLASTIC FILM WRAP

All buried valves and fittings shall be completely encapsulated with polyethylene film as set forth in the Standard Specifications for Plastic Film Wrap of Valves, Flanges and Other Fittings.

END OF SECTION

STANDARD SPECIFICATIONS FOR PLASTIC FILM WRAP OF VALVES, FLANGES, AND OTHER FITTINGS

A GENERAL

This specification designates the requirements for the manufacture and installation of polyethylene plastic wrap around all valves, flanges, and other fittings when buried underground.

B MATERIALS

The polyethylene film shall be of virgin polyethylene and shall meet the requirements of ASTM D1248 for Type I, Class A, Grade E-1, and shall have a flow rate not exceeding 0.4 grams/minute per ASTM D1238.

The polyethylene film shall be 10 mils in thickness. The length shall be sufficient to firmly attach the film to the pipe on either side of the valve, flange, or fitting. The following minimum flat sheet widths shall be used for the specified valve sizes:

Nominal Valve or Flange Size (inches)	Flat Sheet Width (inches)
4 to 8	24
10	30
12	36
16 to 24	48

Tape for securing the polyethylene wrap shall be 2-inch-wide adhesive tape, such as Polyken 900 (polyethylene), Scotchwrap 5 (polyvinyl), or approved equal. The tape shall be such that the adhesive will bond securely to both metal surfaces and polyethylene film.

C INSTALLATION

The valves shall be wrapped by passing the flat sheet of film under the valve bottom and bringing the ends up around the body to the stem and securing it in place with 2-wide strips of the plastic adhesive tape. The polyethylene shall be secured around the valve stem in such a manner as to leave the stem free to operate. The film shall be brought completely around the flanges and secured to the pipe with plastic adhesive tape on either side of the valve, flange or fitting.

END OF SECTION

STANDARD SPECIFICATIONS FOR WATER SERVICES

A WATER SERVICES

Water services shall be installed at the locations shown on the Plans using the type of materials, fittings, valves and appurtenances shown on the Standard Details included with these Specifications. The water services shall be terminated at an angle meter stop at the locations shown on the Standard Details.

B METERS

Water meters shall be purchased from and installed by the District for each service connection. Meters must be ordered from the District a minimum of 30 days prior to date of need.

All meters in any tract will be paid for prior to the installation of the first meter in that tract per District policy adopted on January 4, 1990.

The District will determine meter manufacture, type, and size. The selection of meter size will be based, in part, on the following criteria:

- For services to parcels of 16,000 sf, or less; with house or building size of 3000 sf or less, and with system pressure of 60 psi or greater, meter size will be 3/4 inch. Failure to meet any one of the three criteria may result in the requirement for a larger meter size.

- For services to parcels greater than 16,000 sf, or house or building size greater than 3000 sf, or system pressures less than 60 psi, meter size will be 1 inch or greater.

Water services to residences shall be at least one-inch in diameter. Meters on residential services shall be as selected by the District. Larger diameter services and meters may be used on multiple-residential, commercial landscape irrigation or industrial service connections as determined by the District.

C METER BOXES

Concrete meter boxes shall be as shown in Standard Detail W-3 at the back of these Specifications.

END OF SECTION

STANDARD SPECIFICATIONS FOR CONNECTIONS TO DOMESTIC WATER SYSTEM

A WATER MAINS

Whenever the location of existing mains makes it necessary to use a gradual transition on the alignment of the proposed mains, the transition shall be made in the shortest practical distance with the maximum defection per joint for curves not to exceed 5 degrees if DIP is used. If PVC pipe is used, ductile iron fittings will be required to make the transition. All tie-ins, taps, saddles, and connections to existing District mains must be made in the presence of an authorized District representative.

Water mains shall be installed after curb and gutter installation is complete.

B VALVES AND HYDRANTS

Installation of fittings and hydrants on existing mains shall be made by use of tapping sleeves and valves or by cutting in fittings as determined by the District. Tapping sleeves and valves shall be resilient seat gate valve as specified in the Technical Specifications for Resilient Seat Gate Valves.

C CROSS-CONNECTION CONTROL REQUIREMENTS PER TITLE 17

Cross-connections of any type that permit a backflow condition from any source or system other than that of the District's potable water mains are prohibited. A connection constituting a potential or actual backflow hazard is not permissible unless a backflow device or air gap, which is approved by the California State Division of Drinking Water and complies with Title 17 of the California State Administrative Code, is installed. Such an installation shall at all times be subject to inspection and regulation by the District for the purpose of avoiding possibility of backflow.

The District will not provide any water service to any premises or continue to serve water unless the public water supply is protected as required by state, county and District regulations.

Backflow preventative devices shall be approved by the District and shall be installed by and maintained at the expense of the water user.

The District will require the devices to be tested (a minimum of one time annually) to maintain in satisfactory operating condition.

Service of water to any premises may be discontinued by the District if a backflow prevention device required by the District is not installed; if any defect is found in an installed backflow preventive device; if a backflow preventive device has been removed or bypassed; or if unprotected cross-connections exist on the premises; and service will not be restored until such conditions or defect are corrected.

Additional guidelines to when, why and what types of backflow and cross-connection control devices are approved may be found in:

1. Regulations Relating to Cross-Connections, California Administrative Code - Title 17 – Public Health

2. Manual of Cross-Connection Control Procedures and Practices, State of California, Division of Drinking Water.

Water users which have multiple water systems shall abide by the requirements specified in Title 17 for making safe and unsafe water lines, and have a designated water supervisor, if required by the District.

END OF SECTION

STANDARD SPECIFICATIONS FOR TESTING AND DISINFECTION OF WATER PIPE

A HYDROSTATIC TESTING

PVC and Ductile Iron water lines shall be hydrostatic tested and disinfected in conformance with AWWA 605-05 and AWWA C600-05, respectively, and in accordance with the following specifications.

After completion of the pipeline installation, the line shall be tested under a hydrostatic pressure test at a test pressure noted below, for a period of not less than 4 hours for each section of pipe tested. The pressure shall be maintained by restoring the test pressure whenever it falls 5 psi. At the conclusion of the 4 hours, the test pressure shall be restored and all water used during the tests shall be accurately measured to determine the testing allowance.

The Owner shall provide suitable calibrated tanks for measurement of leakage and shall furnish the necessary bulkheads, piping, calibrated gauges, pumps, power, labor and other means, and shall do everything necessary for filling the pipeline and for obtaining and maintaining the required water pressure.

The testing allowance shall be defined as the quantity of water that must be supplied to the pipe section being tested to maintain a pressure within 5 psi (34 kPa) of the specified hydrostatic test pressure. No installation will be accepted if the quantity of makeup water is greater than that determined by the formula:

$$Q = \frac{LD\sqrt{P}}{148{,}000}$$

Where:

Q = quantity of makeup water, in gallons per hour
L = length of pipe section being tested, in ft
D = nominal diameter of the pipe, in in.
P = average test pressure during the hydrostatic test, in pounds per square in. (gauge)

This formula is based on a testing allowance of 10.5 gpd/mi/in. of nominal diameter at a pressure of 150 psi.

Allowable Leakage per 50 Joints for 4 Hour Test Duration Test Pressure					
Test Pressure	**Nominal Pipe Diameter, in.**				
	4	**6**	**8**	**10**	**12**
200	1.53	2.29	3.06	3.82	4.59
175	1.43	2.15	2.86	3.58	4.29
150	1.32	1.99	2.65	3.31	3.97

The Owner, at his own expense, shall do all excavating necessary to locate and repair leaks or other defects which may develop under test, including removal of backfill already placed. The Owner shall make all repairs necessary to secure the required water tightness and shall replace excavated material, following which the test shall be repeated until the pipe is found satisfactory.

Regardless of the rate of leakage, all detectable leaks shall be repaired.

A-1 SPECIAL PROVISIONS FOR HYDROSTATIC TESTING OF PVC WATER MAINS

After completion of the pipeline installation, the line shall be tested in conformance with AWWA C605-05 and these special provisions.

The hydrostatic test pressure shall not be less than the greater of (a) 1.25 times the maximum anticipated sustained working pressure at the highest point along the test section, or (b) 150 psi, as measured at the low point of the pipeline, unless the pressure exceeds the design pressure limit for any pipe, thrust restraint, valve fitting, or other appurtenance of the test section. In no case shall the test pressure exceed the design pressure limit for any pipe, thrust restraint, valve, fitting, or other appurtenance of the test section.

A-2 SPECIAL PROVISIONS FOR HYDROSTATIC TESTING OF DUCTILE IRON WATER MAINS

After completion of the pipeline installation, the line shall be tested in conformance with AWWA C600-05 and these special provisions.

The hydrostatic test pressure shall not be less than the greater of (a) 1.25 times the stated working pressure of the pipeline measured at the highest elevation along the test section, (b) 1.5 times the stated working pressure measured at the lowest elevation of the test section, or (c) 150 psi measured at the low point of the test section. The test pressure shall not exceed the thrust restraint design pressures or 1.5 times the pressure rating of the pipe or joint, whichever is less (as specified by the manufacturer).

B DISINFECTION OF WATER LINES

After pressure testing and prior to acceptance of the work, newly installed water mains, or water mains that have been taken out of service for maintenance or repair, including all valves, fittings, hydrants and other accessories, shall be disinfected and sampled for bacteriological quality in accordance with

American Water Works Association Standard C651, which is hereby incorporated by reference. Disinfection shall be accomplished using the Continuous-Feed Method of AWWA C651.

Chlorine residual shall be determined in accordance with the method specified in the Appendix to AWWA C651 with amounts of chlorine sufficient to produce a dosage of 50 mg/L free chlorine and a residual of not less than 10 mg/L free chlorine after 24 hours. The Contractor shall provide and keep chlorine residual testing and indicating apparatus available on the site during the disinfection period.

During the chlorination process, all valves and accessories shall be operated. After chlorination, the water shall be flushed from the line at its extremities until the replacement water tests are equal, chemically and bacteriologically, to those of the permanent supply.

It shall be the Owner's responsibility to determine the method of disposal, treatment (if any), obtain permission from the applicable agency, and comply with all federal, state, county, and local regulations regarding treatment and disposal of the chlorinated water.

The Owner shall retain a qualified laboratory to perform a bacteriological test. Such a test shall meet the California Division of Drinking Water requirements for domestic water purposes prior to acceptance by the District for integration and use in the system. The cost of the test(s) shall be borne by the Owner.

After final flushing and before the new water main is connected to the distribution system, two consecutive sets of acceptable samples, taken at least 24 hours apart, shall be collected from the new main. At least one set of samples shall be collected from every 1,200 ft (366 m) of the new water main, plus one set from the end of the line and at least one set from each branch. Samples from new mains shall be negative for coliform bacteria prior to the new main(s) being placed into service.

The new water main shall be kept physically disconnected from the active distribution system until satisfactory completion of the bacteriological test.

END OF SECTION

STANDARD SPECIFICATIONS FOR CONCRETE CONSTRUCTION

A GENERAL

These specifications designate the requirements for furnishing and installation of concrete. All concrete construction shall conform to the provisions of Sections 40 and 90 of the State

Specifications, except as herein modified. Unless otherwise specified, all concrete shall be Class

B CONCRETE

B-1 CLASS A

Class A concrete shall contain not less than six sacks of Portland cement per cubic yard and have a minimum compressive strength of 3,000 psi in 28 days.

B-2 CLASS B

Class B concrete shall contain not less than five sacks of Portland cement per cubic yard and have a minimum compressive strength of 2,500 psi in 28 days.

B-3 CLASS C

Class C concrete shall contain not less than four sacks of Portland cement per cubic yard and have a minimum compressive strength of 2,000 psi in 28 days.

C CONCRETE CONSTRUCTION

The Owner shall submit to the District for approval the design of the mix proposed for use. Said mix design shall set forth weights of cement, sand, coarse aggregate and water to be used together with the grading analysis of sand and coarse aggregate. The source of supply of all materials entering into the mix shall also be given. The mix design and materials shall be approved by the District prior to placing any concrete.

D REINFORCING

Where reinforced concrete is required, reinforcing steel conforming to the applicable provisions of the State Specifications shall be furnished and installed.

END OF SECTION

STANDARD SPECIFICATIONS FOR STEEL CASING PIPE

A GENERAL

Steel casing pipe shall be installed at the locations and to the lines and grades indicated on the plans. All work shall conform to the specifications and requirements of the Agency having jurisdiction over roads, such as City of Lancaster, City of Palmdale, and Los Angeles County.

It shall be the Owner's responsibility to secure all necessary permits for start and prosecution of casing pipe installation and must submit copies to the District prior to issuance of the Permit.

B MATERIALS

Steel casing pipe may be seamless or electric resistance welded (ERW). All field joints shall be butt-welded full circumference or by other means approved by the District. Use of a jacking band to reinforce the end of the pipe receiving the jacking thrust will be required. All joints shall be capable of resisting the jacking stresses without failure. Wall thickness of casing pipe shall be a minimum of 3/8 inch and the diameter shall be of the size approved by the District.

B-1 INSTALLATION

Steel casing pipe of the minimum size and thickness shown on the Plans shall be installed in place by jacking and/or boring methods without the use of water or air, at the locations and to the lines and grades shown on the Plans.

Filling of the annular space between the inside of the casing and the outside of the carrier pipe is not required.

B-2 EARTHWORK AND RESURFACING

Earthwork and resurfacing shall conform respectively to the provisions of the Standard Specifications for Earthwork and Removal and Resurfacing of Street Pavement and Surfaces.

END OF SECTION

STANDARD SPECIFICATIONS FOR REMOVAL AND RESURFACING OF STREET PAVEMENT AND SURFACES

A GENERAL

Street pavement and surfaces shall be removed and replaced in all areas of construction excavation in conformance with details shown on the plans and as specified herein. Resurfacing of existing pavement and surfaces damaged or removed in connection with the construction of improvements shall conform to the provisions of permits issued by the state, county or other agency for the work within the rights-of-way of the respective agency.

B EARTHWORK

Earthwork shall conform to the provisions of the Technical Specifications for Earthwork of these specifications.

C PAVEMENT REMOVAL

C-1 GENERAL

Street pavement or existing road surfacing shall be removed within the limits of all construction excavations prior to proceeding with excavation operations of any nature. Surplus material shall be removed as provided in the Technical Specifications for Earthwork. Prior to removal of existing surfacing, pavement cuts shall be made as shown on the Plans and/or specified herein. All pavement cuts shall be neat and straight along both sides of the trench and parallel to the alignment of the pipe to provide an unfractured and level pavement joint for bonding existing surfacing with pavement replacement. Where large irregular surfaces are removed, such trimming or cutting as hereinafter provided shall be parallel with roadway centerline or at right angles to the same. All cut edges shall provide clean, solid, vertical faces free from all loose material.

C-2 PORTLAND CEMENT CONCRETE SURFACES

Concrete pavement, including cross-gutters, curbs and gutters, sidewalks, driveways and concrete surfaces of whatever nature, shall be saw cut to minimum depth of 1-1/2 inches prior to removal in accordance with details shown on the Plans or as specified herein. Said saw cut shall be made at a point approximately 1 foot beyond the edge of the trench and/or excavation. The saw cut shall be made after backfilling, and the additional concrete pavement shall be removed and disposed of prior to resurfacing.

C-3 ASPHALT CONCRETE PAVEMENT

Streets and alleys surfaced with asphalt concrete pavement shall be initially cut by means of pneumatic pavement cutters or other approved equipment at the limits of the trench and/or excavation prior to removal of surfacing. After backfilling the excavation, asphalt concrete pavement shall be saw cut to a minimum depth of 4 inches at a point not less than 9 inches

outside the limits of excavation or the previous pavement cut (made by pneumatic tools), whichever limits are the greater. The additional surfacing so cut shall be removed and disposed of prior to resurfacing.

C-4 ROAD MIXED SURFACING

Streets and alleys surfaced with road mixed surfacing shall be cut at the limits of the trench and/or excavation prior to removal of existing surfacing. Cuts may be made with pneumatic tools or other approved equipment. The extra trimming width made by saw cuts prior to resurfacing asphalt concrete pavement will not be required.

D RESURFACING

In all streets or alleys in which the surface is removed, broken or damaged by equipment or in which the ground has caved in or settled due to the installation of the improvements, the surface shall be restored to the original grade and crown section. Where the street has been improved with roadway surface, base course, curb, sidewalk or gutter, trenches or damaged sections shall be restored with the type of improvement conforming to that which existed prior to the work. Prior to resurfacing, the existing surfacing shall be removed as provided above. All broken and jagged edges of the trench edge shall be straight. If during the initial removal of the existing pavement a method of removal was used which disturbed the adjoining pavement or if during general construction the adjacent pavement was disturbed, then this adjoining pavement must also be removed and replaced with its equivalent aggregate base, and asphalt concrete paving above the cement treated base shall be sawed in a straight line and replaced in kind.

All work shall match the appearance of the existing improvements and finished pavement shall not deviate from existing grade by more than 1/8 inch in 10 feet and shall be free from ruts, depressions, and irregularities. Asphaltic paint binder shall be applied to the vertical faces of all asphaltic concrete pavement against which the pavement replacement materials are to be placed. The completed surface, when ready for acceptance, shall be thoroughly compacted, true to grade and cross section and shall be free from ruts, depressions and irregularities.

Where the trench line is approximately parallel with the traveled way, the pavement shall be brought to the final grade with a Barber-Green paving machine or approved equal. The resulting edge of contact between the new and existing pavement on each side shall parallel the existing trench and be a straight and neat join line. New pavement shall not lap over existing pavement.

In the event that no pavement structural section requirements are specified by any other agency, the minimum pavement section for patches shall be 4-inches of asphalt pavement (Type B, 3/4-inch maximum aggregate, AR-4000 asphalt) over 8-inches of Class 2 aggregate base compacted to 95 percent (95%) relative compaction per the latest edition of the State Specifications.

E TEMPORARY RESURFACING

In the event that it is necessary to construct a temporary patch, the materials used shall conform to the requirements of the applicable state, County or City agency. Permanent pavement shall be constructed as soon as practical and as required by the applicable State, County or City agency.

END OF SECTION

STANDARD SPECIFICATION FOR CLEAN-UP

A GENERAL

During the progress of the work, the work area shall be kept free of any accumulation of rubbish and debris. Upon completion of the work and before Acceptance of the completed facility by the District, all unused materials, rubbish, concrete forms, surplus excavated material and other materials or equipment shall be removed from the work area.

If during the progress of the work any improvements, such as, fences, lawns, shrubs or other vegetation, whether on private or public property, are damaged, they shall be restored to a condition equivalent to that which existed before work started before acceptance of the completed facilities by the District.

B WATER MAIN CLEANING

Prior to the acceptance of any water line by the District, the contractor shall flush, disinfect, and test the water line. Flushing, disinfecting, and testing of water lines shall take place after all construction work is completed, up to but not including, the paving. The system will be inspected after final paving is completed and any damage to the system during final paving and cleanup will be corrected before approval.

END OF SECTION

STANDARD DETAILS

WATER NOTES

1. THE WATER FACILITIES TO BE DEDICATED TO THE QHWD SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT DISTRICT STANDARD SPECIFICATIONS.
2. THE QHWD SHALL BE NOTIFIED AT LEAST FIVE (5) WORKING DAYS PRIOR TO START OF CONSTRUCTION. TELEPHONE (661) 943-3170.
3. THE CONSTRUCTION PLANS MUST BE APPROVED BY THE QHWD PRIOR TO THE START OF CONSTRUCTION. TWO (2) SETS OF APPROVED PLANS SHALL BE FURNISHED TO THE QHWD AND ONE (1) SET OF THE SAME TO THE DISTRICT'S ENGINEER. PRIOR TO DISTRICT APPROVAL, THE PLANS MUST BE SIGNED BY A CALIFORNIA REGISTERED CIVIL ENGINEER.
4. PRIOR TO ACCEPTANCE OF THE WATER FACILITIES, ALL NECESSARY EASEMENT DOCUMENTS SHALL BE PROPERLY EXECUTED AND RECORDED. THREE (3) HARD COPIES AND ONE (1) ELECTRONIC COPY (ADOBE PDF.) OF THE RECORDED DOCUMENTS SHALL BE FURNISHED TO QHWD.
5. WATER MAINS SHALL BE INSTALLED 8 FEET FROM THE CURB FACE UNLESS OTHERWISE INDICATED ON THE PLANS.
6. ALL WATER SERVICES SHALL BE METERED. DISTRICT FORCES TO CONNECT ALL SERVICE TO ALL METERS. ALL WATER METERS ARE TO BE APPROVED BY QHWD. METER BOXES WILL BE SET BY THE CONTRACTOR. ALL METERS SHALL BE PURCHASED AND DELIVERED TO QHWD BY THE CONTRACTOR FOR INSTALLATION BY QHWD. ALL METER BOXES ARE TO BE APPROVED BY QHWD AND INSTALLED BY THE CONTRACTOR.
7. CONTRACTORS WILL COORDINATE ALL TIE-INS OF NEW WATER MAINS TO EXISTING WATER MAINS WITH DISTRICT FORCES TO KEEP INTERRUPTIONS AT A MINIMUM. ONLY DISTRICT PERSONNEL WILL OPERATE EXISTING FACILITIES.
8. THE WATER SYSTEM, INCLUDING LATERALS, SHALL BE HYDROSTATICALLY TESTED, AFTER ALL UNDERGROUND UTILITIES ARE CONSTRUCTED, AND PRIOR TO PLACING STREET PAVEMENT.
9. ALL VALVES SHALL BE FLANGE CONNECTED TO FITTINGS.
10. ALL WATER LINES SHALL HAVE A MINIMUM COVER OF 36 INCHES.
11. ONE COMPLETE SET OF DRAWINGS (REPRODUCIBLE 3-MIL DOUBLE MATTE FILM) ALONG WITH ELECTRONIC (AUTOCAD DWG.) FILES SHALL BE FURNISHED TO THE DISTRICT ON COMPLETION OF CONSTRUCTION.
12. DUCTILE IRON FITTINGS SHALL HAVE MECHANICAL JOINT ENDS SUITABLE FOR CAST IRON OUTSIDE DIAMETERS.
13. CONTRACTOR SHALL ADJUST VALVE BOXES, FIRE HYDRANT BREAK-OFF FLANGES, METER BOXES, ETC. TO SUBDIVISION FINISH GRADE AFTER FINISH GRADES ARE ESTABLISHED AT NO COST TO QHWD.
14. WHERE FIRE HYDRANTS ARE INSTALLED OR UPGRADED, THE CONTRACTOR SHALL INSTALL REFLECTORIZED, RAISED PAVEMENT MARKERS (STIMSONITE HYDRANT MARKERS), ALSO COMMONLY CALLED "BLUE DOTS". A TWO PART EPOXY ADHESIVE SHALL BE USED TO INSTALL THE MARKERS. THE LOCAL DISTRIBUTOR FOR THESE PRODUCTS IS: BAUER COATING, 1021 N. MISSION ROAD, LOS ANGELES, CA. 90033, TELEPHONE NO. (800) 338-7680. ONE MARKER SHALL BE INSTALLED PERPENDICULARLY OPPOSITE EACH FIRE HYDRANT, APPROXIMATELY 6-INCHES OFFSET FROM THE CENTERLINE OF THE STREET ON THE HYDRANT SIDE OF THE STREET. TWO MARKERS SHALL BE REQUIRED IN THE CITY OF LANCASTER.
15. IF OFFSET CONNECTING LINE IS NOT IN PLACE, A BLOWOFF VALVE SHALL BE INSTALLED AT THE END OF THE LINE.
16. WHEN CONNECTION TO AN EXISTING LINE ALLOWS THE REMOVAL OF EXISTING WATER SYSTEM APPURTENANCE, SAID REMOVED APPURTENANCE SHALL BE SALVAGED AND DELIVERED TO QHWD.
17. DURING CONSTRUCTION OF THE IMPROVEMENTS, THE CONTRACTOR SHALL NOTE ALL DEVIATIONS FROM THE PLANS ON A SET OF OF PLANS SPECIFICALLY SET ASIDE FOR THIS PURPOSE. ANY CHANGES SHALL BE MADE ON THE ORIGINALS OF THE PLANS WITH A SUITABLE NOTE ON EACH SHEET STATING THAT THE ORIGINALS ARE THE "RECORD DRAWINGS".
18. UPON COMPLETION OF CONSTRUCTION, ONE COMPLETE SET OF RECORD DRAWINGS, ALONG WITH ELECTRONIC (AUTOCAD DWG. AND ESRI SHAPE FILES) FILES SHALL BE FURNISHED TO THE DISTRICT.
19. WORK SHALL BE DONE IN ACCORDANCE WITH THE APPROPRIATE ENCROACHMENT PERMITS.
20. FIRE HYDRANTS, METER BOXES AND BLOWOFF SHALL BE LOCATED NO CLOSER THAN 5-FEET FROM BEGINNING OF CURB RETURN, DRIVEWAY OR ANY OTHER UTILITY.
21. COMPACTION TESTING SHALL BE PERFORMED AT THE CONTRACTOR'S EXPENSE IN ACCORDANCE WITH THE DISTRICT STANDARD FOR EARTHWORK. WRITTEN TEST RESULTS (3 COPIES) SHALL BE SUBMITTED TO THE DISTRICT'S REPRESENTATIVE.

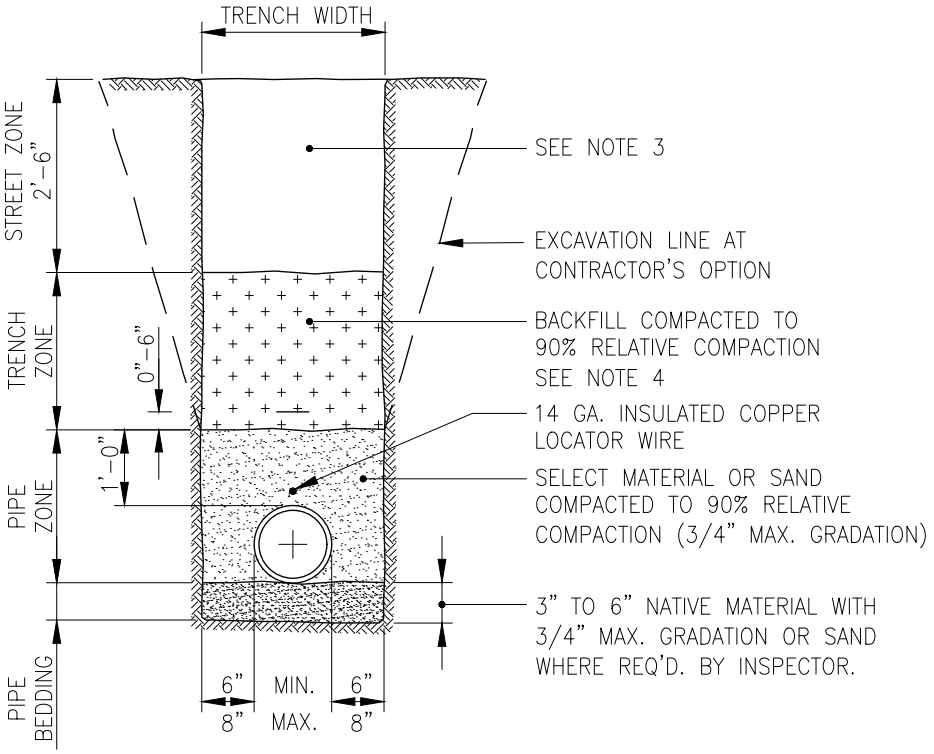
DATE	REVISION

QUARTZ HILL WATER DISTRICT

STANDARD WATER NOTES

DATE DRAWN

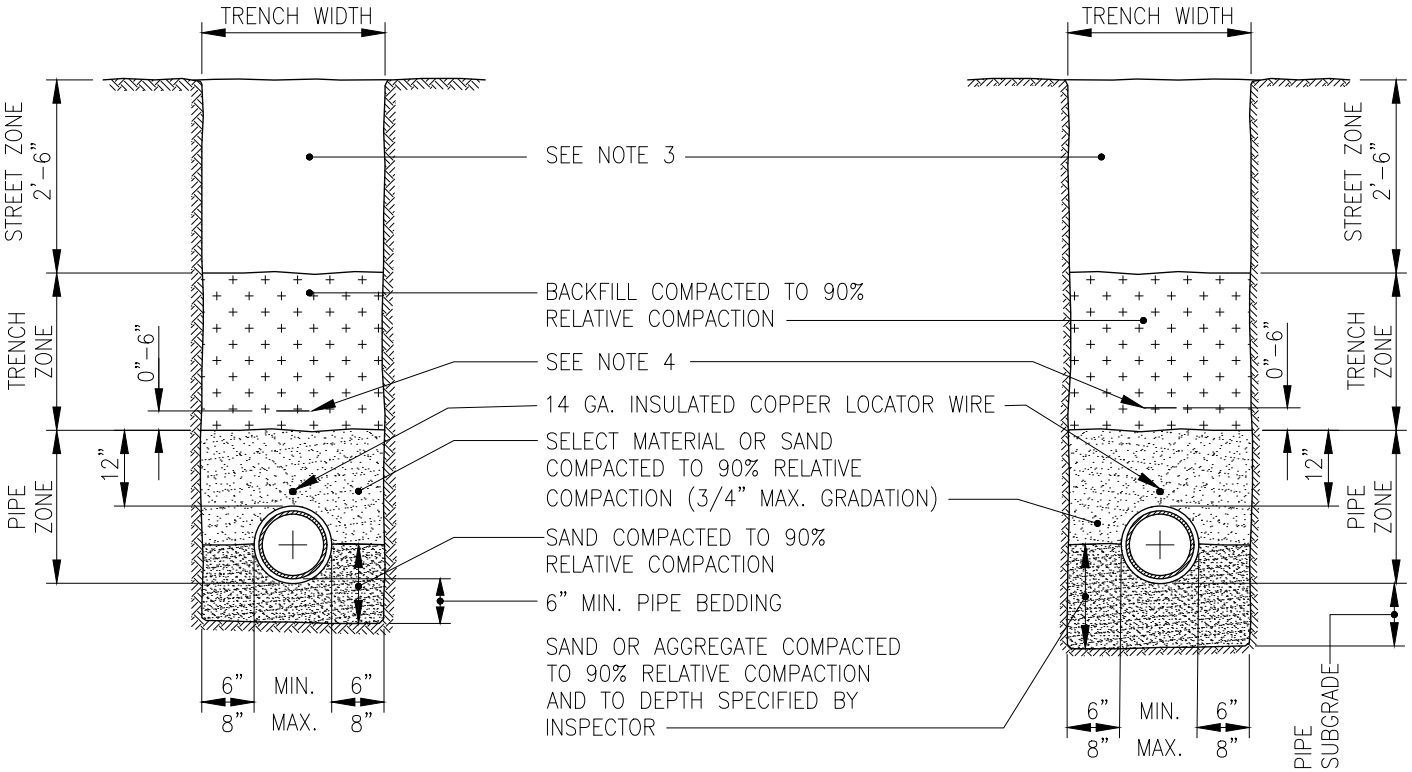
SHEET NO. W-1



TYPE 1
NORMAL

NOTES:

1. SAND AND SELECT MATERIAL SHALL BE PER STANDARD SPECIFICATIONS FOR EARTHWORK.
2. SEE STANDARD SPECIFICATIONS FOR EARTHWORK IF TRENCH WIDTH EXCEEDS THE MAXIMUM SHOWN ON THIS DRAWING.
3. STREET ZONE TO BE COMPACTED TO 95% RELATIVE COMPACTION IF WITHIN ROADBED OR TO 90% RELATIVE COMPACTION IF OUTSIDE OF ROADBED. SEE STANDARD SPECIFICATIONS FOR EARTHWORK.
4. 3" WIDE DETECTABLE WARNING TAPE, BLUE STRIPE WITH BLACK LETTERS STATING CAUTION BURIED WATER LINE BELOW.



TYPE 2
ROCKY OR OVER-EXCAVATED

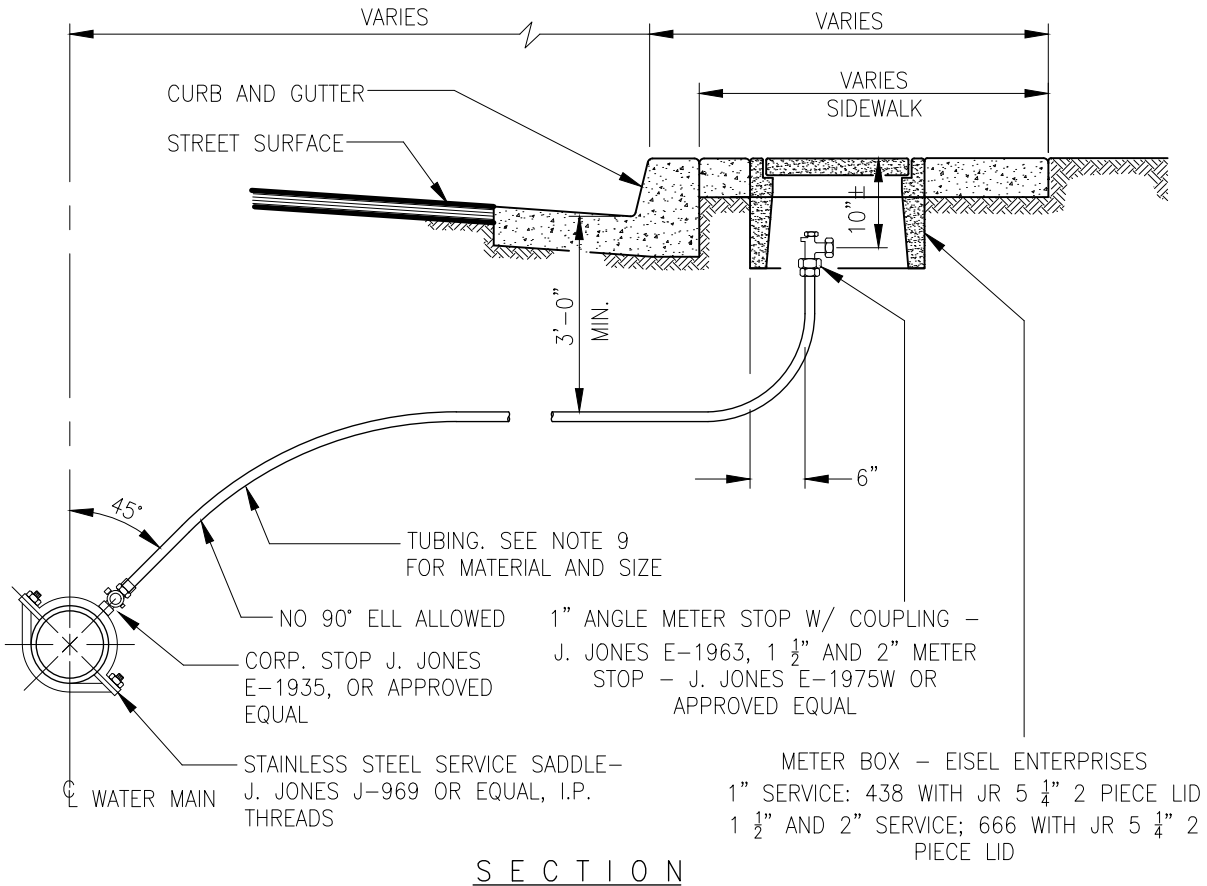
TYPE 3
UNSUITABLE MATERIALS IN SUBGRADE

DATE	REVISION

QUARTZ HILL WATER DISTRICT

WATER PIPE BEDDING AND BACKFILL DETAILS

DATE DRAWN	SHEET NO.
	W-2

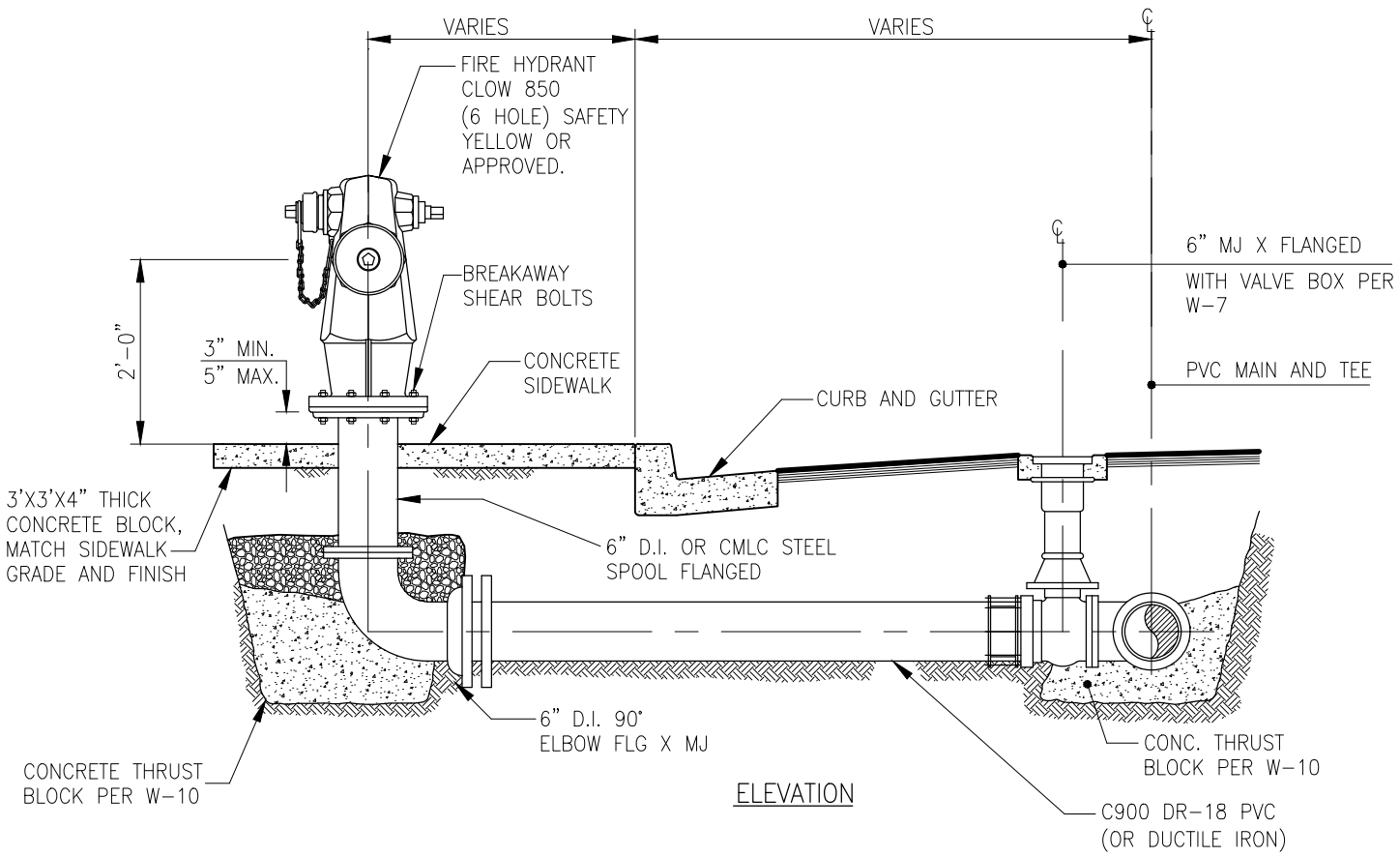


S E C T I O N

GENERAL NOTES:

1. SIZE OF SERVICES SHALL BE DETERMINED BY THE DISTRICT. METERS SHALL BE PURCHASED FROM AND INSTALLED BY THE DISTRICT.
2. WATER SERVICE LINES SHALL BE PERPENDICULAR TO THE CENTERLINE OF THE STREET FROM THE WATER MAIN TO THE METER STOP EXCEPT IN CUL-DE-SACS AND KNUCKLES.
3. WHERE SERVICE LINES ARE NOT PERPENDICULAR TO THE STREET CENTERLINE, A WATERLINE CAUTION TAPE SHALL BE PLACED IN THE TRENCH 15 INCHES ABOVE THE SERVICE LINE.
4. WHERE SIDEWALKS ARE ADJACENT TO CURBS, THE METER SHALL BE INSTALLED IN THE SIDEWALK AT THE BACK OF THE CURB.
5. WHERE A METER BOX IS TO BE LOCATED ON A SLOPE NEXT TO A CURB, A PROTECTIVE RETAINING WALL SHALL BE CONSTRUCTED.
6. THE METER BOX SHALL BE LOCATED 6-FEET FROM THE END OF THE DRIVEWAY WHICH IS MOST DISTANT FROM THE PROPERTY LINE.
7. CORPORATION STOP TAPS SHALL BE MADE AS SPECIFIED BY THE PIPE MANUFACTURER'S INSTALLATION GUIDE. ALL DRY TAPS SHALL BE MADE WITH MACHINES EQUIPPED WITH GUIDES OR PILOTS FOR THE TAPS.
8. ALL FITTINGS AND VALVES SHALL CONFORM TO AWWA C800.
9. SERVICE TUBING SHALL BE COPPER TUBING SIZE (CTS) MULTI LAYER, CPVC-AL-CPVC CONFORMING TO ASTM 2855 FOR 1" SERVICE OR COPPER CONFORMING TO AWWA C901, CL160 AND D2737 FOR 1 ½" AND 2" SERVICES.
10. ALL SERVICE SADDLE'S, AND COMPRESSION NUTS TO BE TORQUED TO MANUFACTURER'S SPECIFICATION.
11. CPVC-AL-CPVC MULTILAYER TUBING SHALL BE SERVICE GUARD COMPOSITE PIPE (WWW.UNDERGROUNDSOLUTIONS.COM) OR APPROVED EQUAL.

		QUARTZ HILL WATER DISTRICT	
		1", 1 1/2" & 2" STANDARD WATER SERVICES	
DATE	REVISION	DATE DRAWN	SHEET NO. W-3



ELEVATION

NOTES:

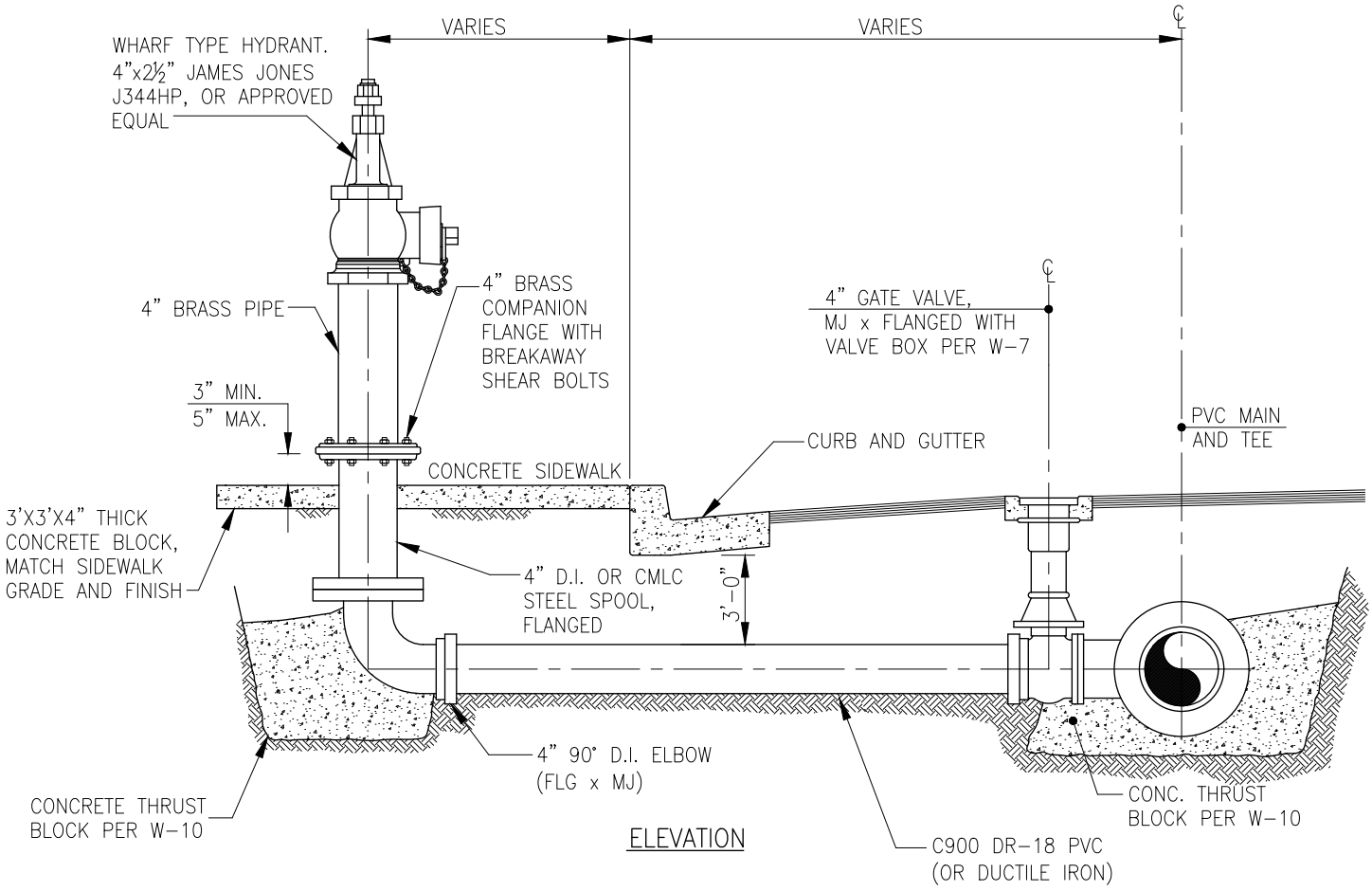
1. CENTERLINE OF RISER SHALL BE 24-INCHES BEHIND CURB FACE EXCEPT WHERE 5-FOOT SIDEWALK IS ADJACENT TO CURB, IN WHICH CASE THE RISER SHALL BE A 6.5-FEET OR AS SHOWN ON THE PLANS.
2. SET CENTER OF BOTTOM OUTLET 24-INCHES ABOVE TOP OF CURB, OR IN THE ABSENCE OF A CURB, 24-INCHES ABOVE THE CROWN OF THE ROADWAY.
3. BARRICADES PER STD W-14 ARE REQUIRED WHERE HYDRANT IS NOT PROTECTED BY STANDARD CURB AND GUTTER.
4. WHERE FIRE HYDRANTS ARE INSTALLED OR UPGRADED, THE CONTRACTOR SHALL INSTALL REFLECTORIZED, RAISED PAVEMENT MARKERS (STIMSONITE HYDRANT MARKERS), ALSO COMMONLY CALLED "BLUE DOTS". A TWO PART EPOXY ADHESIVE SHALL BE USED TO INSTALL THE MARKERS. THE EPOXY COMES IN EITHER GALLON CONTAINERS OR SMALL TUBES FOR ON SITE MIXING. THE LOCAL DISTRIBUTOR FOR THESE PRODUCTS IS: BAUER COATING, 1021 N. MISSION ROAD, LOS ANGELES, CA. 90033, TELEPHONE NO. ~~(213) 225-4154.~~
   ONE MARKER SHALL BE INSTALLED PERPENDICULARLY OPPOSITE EACH FIRE HYDRANT, APPROXIMATELY 6-INCHES OFFSET FROM THE CENTERLINE OF THE STREET ON THE HYDRANT SIDE OF THE STREET. TWO MARKERS SHALL BE REQUIRED IN THE CITY OF LANCASTER.
5. THE DISTANCE BETWEEN THE CENTERLINE OF THE HYDRANT TO THE CENTERLINE OF THE VALVE SHALL BE A MINIMUM OF 10-FEET.
6. ALL BURIED D.I. JOINTS SHALL BE RESTRAINED MECHANICAL JOINTS.

DATE	REVISION

QUARTZ HILL WATER DISTRICT

FIRE HYDRANT ASSEMBLY

DATE DRAWN	SHEET NO.
	W-4

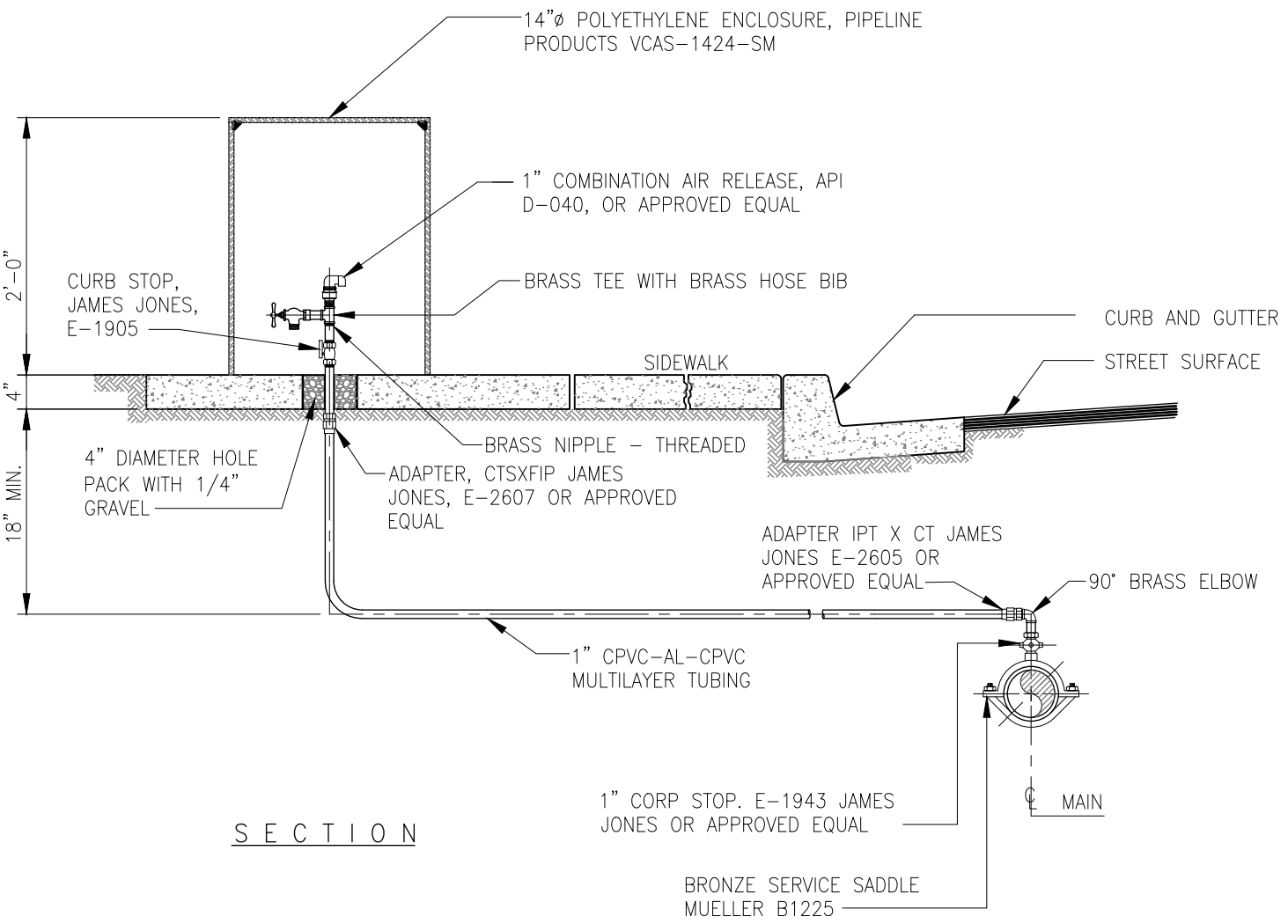


ELEVATION

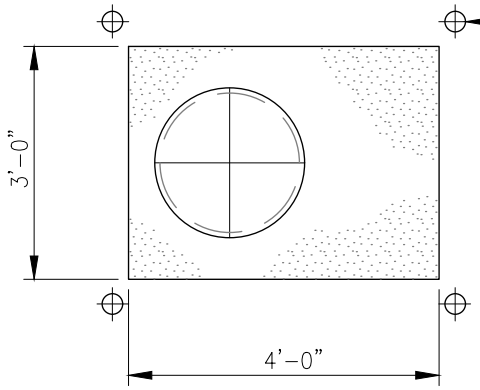
NOTES:

1. CENTERLINE OF RISER SHALL BE 24-INCHES BEHIND CURB FACE EXCEPT WHERE 5-FOOT SIDEWALK IS ADJACENT TO CURB, IN WHICH CASE THE RISER SHALL BE A 6.5-FEET OR AS SHOWN ON THE PLANS.
2. SET CENTER OF BOTTOM OUTLET 24-INCHES ABOVE TOP OF CURB, OR IN THE ABSENCE OF A CURB, 24-INCHES ABOVE THE CROWN OF THE ROADWAY.
3. BARRICADES PER STD W-14 ARE REQUIRED WHERE HYDRANT IS NOT PROTECTED BY STANDARD CURB AND GUTTER.
4. THE DISTANCE BETWEEN THE CENTERLINE OF THE HYDRANT TO THE CENTERLINE OF THE VALVE SHALL BE A MINIMUM OF 10-FEET.
5. THE EXTERIOR OF THE ABOVE GROUND PORTION OF THE BLOWOFF, EXCEPT FOR THE THREADS, SHALL BE COATED USING A ONE COMPONENT ACRYLIC ENAMEL HAVING A MINIMUM SOLIDS CONTENT OF 35% WITH AN INORGANIC ZINC PRIMER (FOREST GREEN).

		QUARTZ HILL WATER DISTRICT		
		BLOWOFF ASSEMBLY		
DATE	REVISION		DATE DRAWN	SHEET NO. W-5



S E C T I O N



P L A N

WHERE THERE IS NO STANDARD CURB AND GUTTER, INSTALL BARRACADES PER W-11

GENERAL NOTES:

1. REFER TO SHEET W-2 FOR SPECIFICATIONS FOR TUBING, VALVES AND FITTINGS.
2. THE ARV ENCLOSURE SHALL BE PAINTED WITH TWO COATS OF DEVOE NO. 233 WHITE EPOXY AND TWO COATS OF DEVOE NO. 379 DEVTHANE (FOREST GREEN).
3. CPVC-AC-CPVC MULTILAYER TUBING SHALL BE SERVICE GUARD COMPOSITE PIPE (WWW.UNDERGROUNDSOLUTIONS.COM) OR APPROVED EQUAL.
4. ANCHOR ENCLOSURE BASE RING PER MANUFACTURER'S INSTRUCTIONS.

DATE	REVISION

QUARTZ HILL WATER DISTRICT

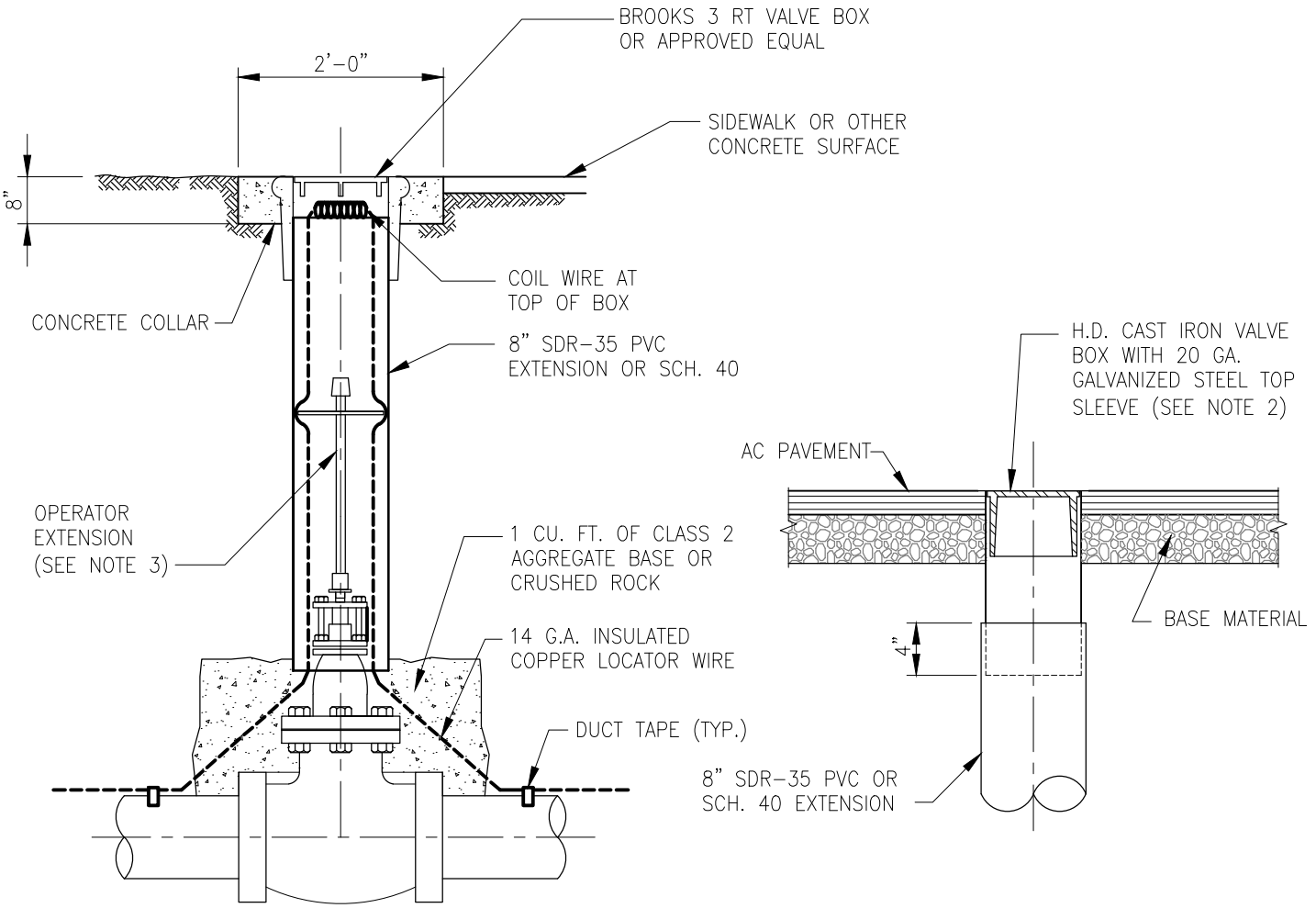
COMBINATION AIR RELEASE VALVE ASSEMBLY

mkn WATER · WASTEWATER · REUSE

DATE DRAWN:

SHEET NO. W-6

DWG: \\MKN01\Company\Projects\QHWD\QHWD-2016-001 District Standard Specifications Update\300 Engineering\301 CAD\Planset\Standards\W-6.dwg USER: JimF
DATE: Oct 27, 2016 2:20pm XREFS: BORDER_



SECTION – ELEVATION

GENERAL NOTES:

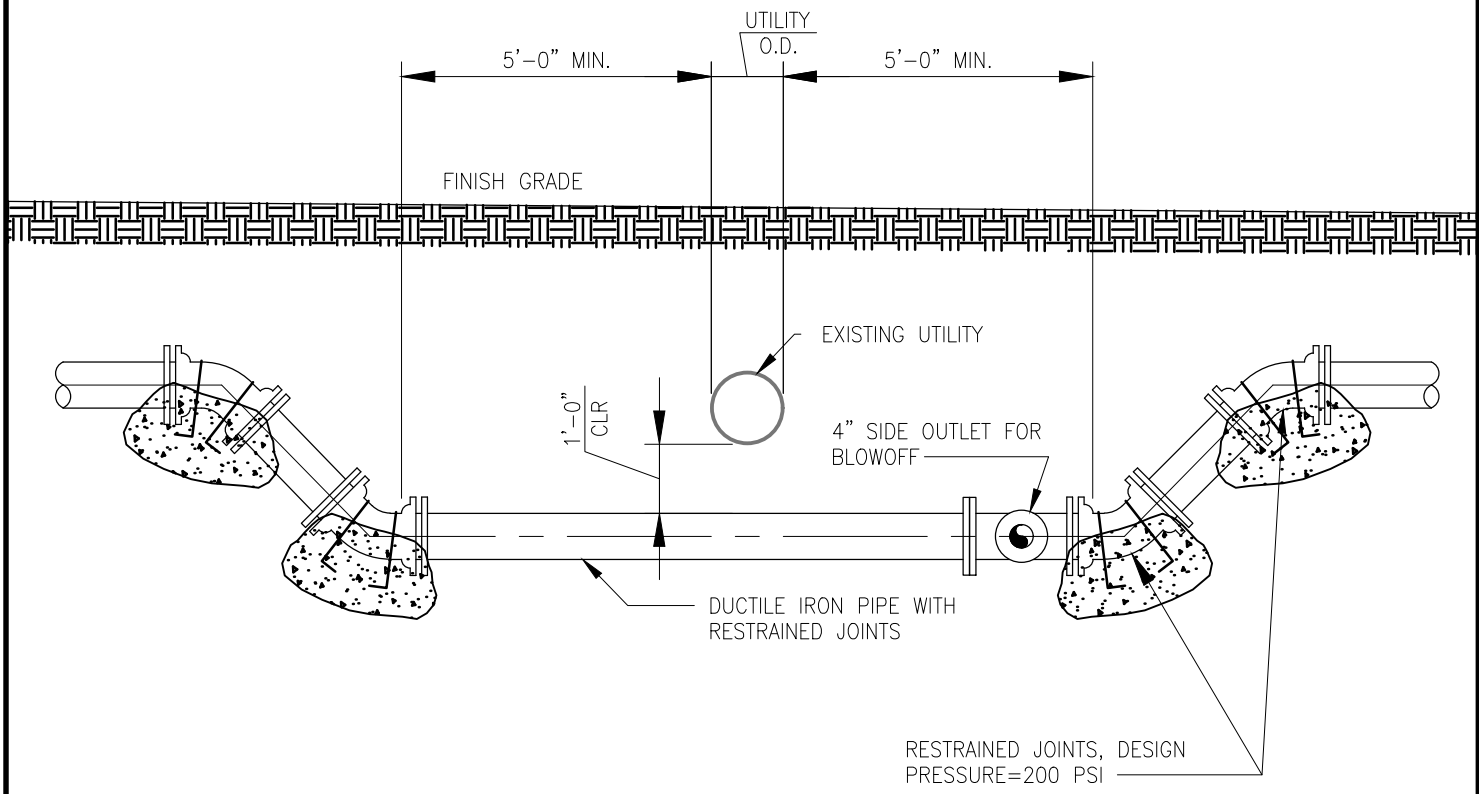
1. IN UNPAVED AREAS, SIDEWALKS, OR OTHER CONCRETE SURFACES, INSTALL CONCRETE VALVE BOX WITH A CONCRETE COLLAR.
2. IN A.C. PAVEMENT, INSTALL CAST IRON VALVE BOX, CAP SHALL BE EPOXY COATED BLUE AND MARKED "WATER". CONTRACTOR SHALL VERIFY COLOR OF CAP WITH DISTRICT.
3. 1 1/4 –INCH DIA. GALVANIZED STEEL PIPE WITH 2–INCH SQUARE BOX AT BASE AND 2–INCH SQUARE OPERATING NUT AT TOP, AND 1/4–INCH CENTERING PLATE, CUT 1/4–INCH SMALLER THAN THE I.D. OF THE VALVE RISER. PROVIDE OPERATOR EXTENSION IF VALVE OPERATOR NUT IS MORE THAN 3' BELOW FINISH GRADE.
4. ALL VALVE BOX LIDS SHALL BE FLUSH WITH THE FINISH STREET GRADE.
5. IN A.C. PAVEMENT, INSTALL H.D. CAST IRON VALVE BOX. CAP SHALL BE EPOXY COATED BLUE AND MARKED "WATER", AND 20 GAUGE GALVANIZED STEEL TOP SLEEVE (SLIP CAN). CONTRACTOR SHALL VERIFY COLOR OF CAP WITH DISTRICT.

DATE	REVISION

QUARTZ HILL WATER DISTRICT

VALVE BOX ASSEMBLY

DATE DRAWN	SHEET NO.
	W–7



NOTES:

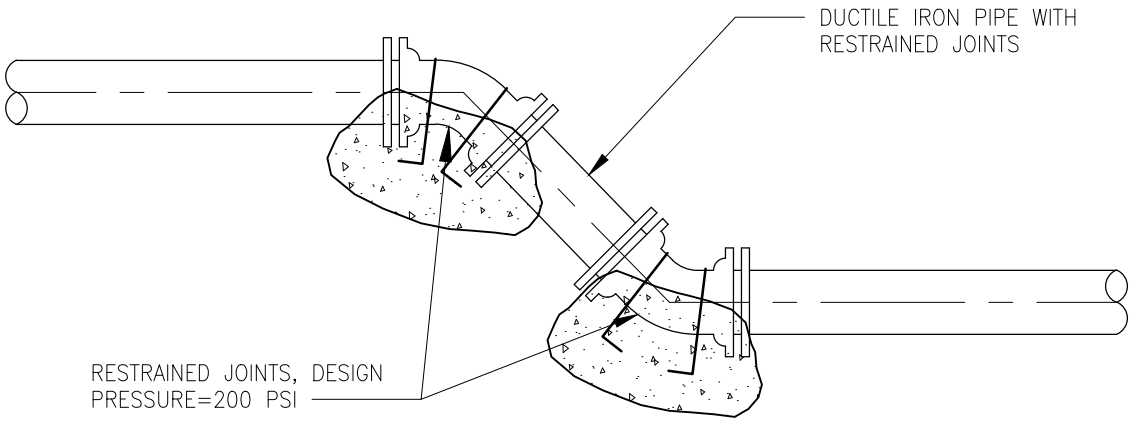
1. PROVIDE NSF-61 CERTIFIED FULL FACE GASKETS AT ALL FLANGES.
2. UTILITY CROSSING DETAIL DOES NOT INCLUDE CROSSING EXISTING SEWER LINES. REFER TO CALIFORNIA CODE OF REGULATIONS SECTION 64572, TITLE 22 IN APPENDIX _ FOR INFORMATION ON CROSSING SEWAGE, RECYCLED WATER, DISINFECTED SECONDARY, STORM DRAINS AND OTHER NON POTABLE FLUID CONVEYANCE LINES.
3. PROVIDE BLOWOFF WHERE REQUIRED BY THE DISTRICT.

DATE	REVISION

QUARTZ HILL WATER DISTRICT

PIPE CROSSING

DATE DRAWN	SHEET NO.
	W-8



NOTES:

1. PROVIDE NSF-61 CERTIFIED FULL FACE GASKETS AT ALL FLANGES.
2. UTILITY CROSSING DETAIL DOES NOT INCLUDE CROSSING EXISTING SEWER LINES. REFER TO CALIFORNIA CODE OF REGULATIONS SECTION 64572, TITLE 22 IN APPENDIX _ FOR INFORMATION ON CROSSING SEWAGE, RECYCLED WATER, DISINFECTED SECONDARY, STORM DRAINS AND OTHER NON POTABLE FLUID CONVEYANCE LINES.

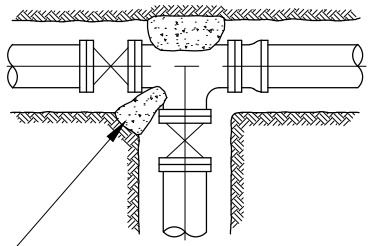
DATE	REVISION

QUARTZ HILL WATER DISTRICT

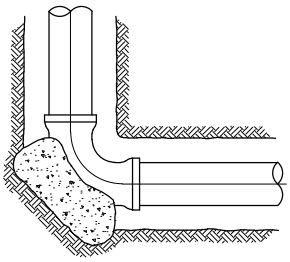
HORIZONTAL ALIGNMENT TRANSITION

DATE DRAWN

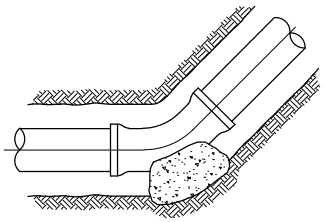
SHEET NO. W-9



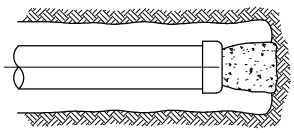
CONDITION 1
(OUTLET OR FIRE HYDRANT)



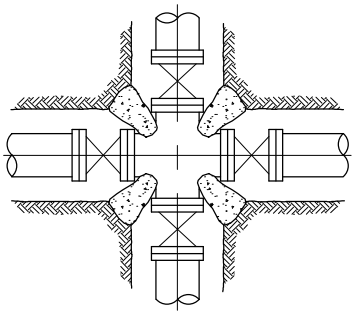
CONDITION 2
(ANGLE = 90°)



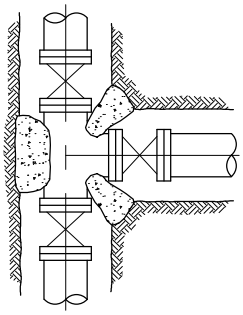
CONDITION 3
(ANGLE = 45°)



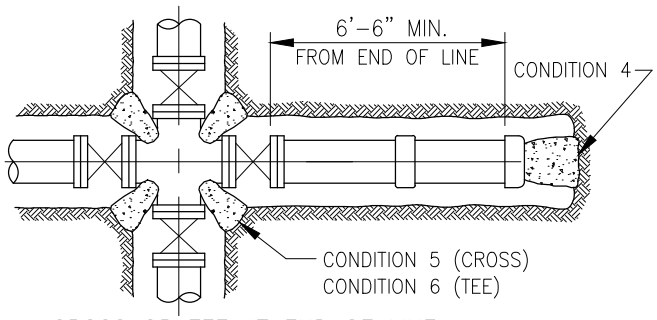
CONDITION 4
(END CAP)



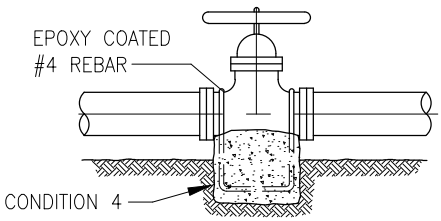
CONDITION 5
(MAINLINE CROSS)



CONDITION 6
(MAINLINE TEE)



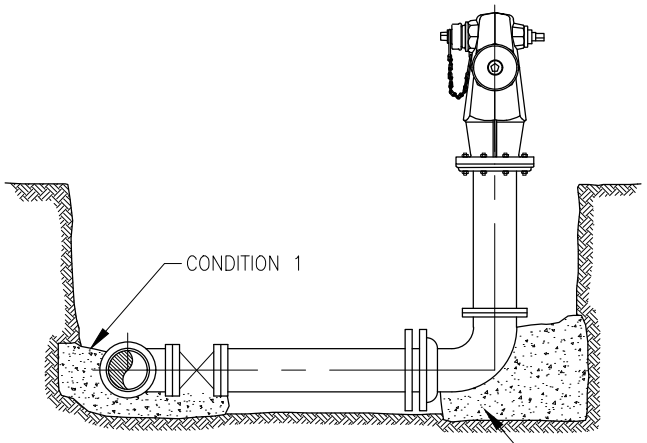
CROSS OR TEE AT END OF LINE



ANCHOR FOR IN LINE
12" VALVES OR LARGER

THRUST BLOCK BEARING AREA IN SQ. FT.						
PIPE SIZE	CONDITION					
	1	2	3	4	5	6
6"	5.0	7.0	4.0	5.0	3.5 EACH	3.5 EACH
8"	8.5	12.0	6.5	8.5	6.0 EACH	6.0 EACH
10"	13.0	18.5	10.0	13.0	9.0 EACH	9.0 EACH
12"	18.5	26.0	14.0	18.5	13.0 EACH	13.0 EACH

BASED ON 1500 P.S.F., 200 P.S.I. TEST PROCEDURE



FIRE HYDRANT

NOTES:

1. SIZE THRUST BLOCK ACCORDING TO THE LARGEST OUTLET DIAMETER ON TEE OR CROSS.
2. ALL THRUST BLOCK BEARING FACES SHALL BE POURED AGAINST UNDISTURBED SOIL OR APPROVED COMPACTED BACKFILL.
3. SEE SPECIFICATIONS FOR CONCRETE REQUIREMENTS.
4. THRUST BLOCK AREAS ARE BASED ON A MAXIMUM ALLOWABLE SOIL PRESSURE OF 2000 PSF AND A TEST PRESSURE OF 200 PSI, WITH A SAFETY FACTOR OF 1.25.
5. FOR ALLOWABLE SOIL PRESSURES LESS THAN 2000 PSF OR A TEST PRESSURE OF GREATER THAN 200 PSI, AREAS SHALL BE CALCULATED BASED ON $T=0.785 \times \text{TEST PRESSURE} \times (\text{PIPE DIA})^2 \times 1.25$.
6. CONCRETE TO BE CLASS B. SHIELD CONCRETE FROM FLANGES AND BOLTS.

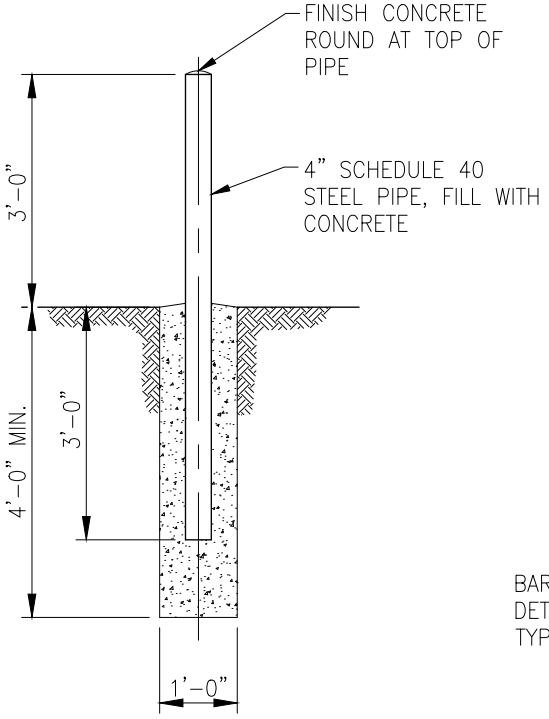
DATE	REVISION

QUARTZ HILL WATER DISTRICT

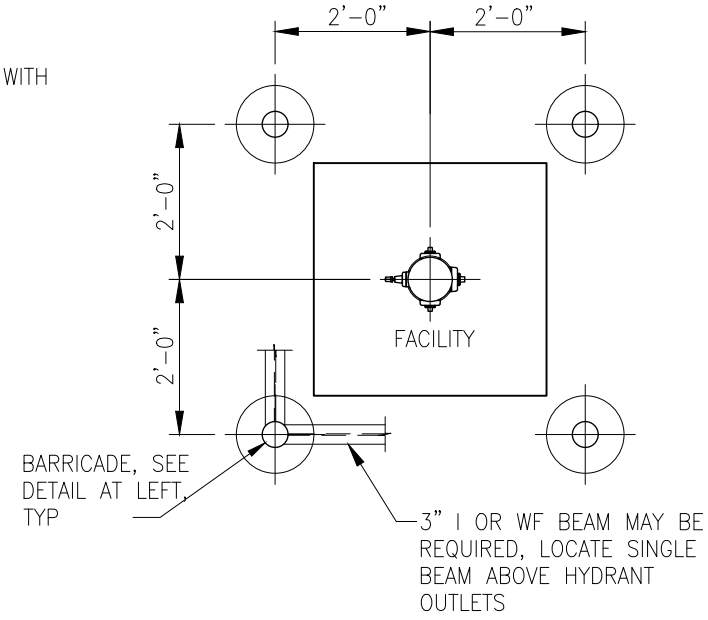
TYPICAL THRUST BLOCK DETAILS

DATE DRAWN

SHEET NO.
W-10



BARRICADE DETAIL



BARRICADE PLAN

NOTES:

1. EXACT LOCATION OF BARRICADES MAY BE CHANGED BY THE DISTRICT IN THE FIELD.
2. SEE PLANS FOR NUMBER OF BARRICADES TO BE USED AND FOR BRACES, IF REQUIRED.
3. THE EXTERIOR OF THE ABOVE GROUND PORTION OF THE BARRICADE SHALL BE PAINTED MEDIAN YELLOW.
4. FOR SAFETY, BARRICADE SHALL NOT BE INSTALLED INSIDE THE CLEAR ZONE FOR A ROADWAY AS DEFINED BY CALTRANS.

		QUARTZ HILL WATER DISTRICT	
		BARRICADES	
DATE	REVISION	DATE DRAWN	SHEET NO. W-11

APPENDIX A - CONTRACT

APPENDIX A
QUARTZ HILL WATER DISTRICT
CONTRACT FOR ACQUISITION AND CONSTRUCTION OF WATER SYSTEM IMPROVEMENTS
TRACT NO. _____

THIS CONTRACT is entered into as of the ____ day of _____, _____, by and between QUARTZ HILL WATER DISTRICT, a County Water District organized and existing under the provisions of Division 12 of the Water Code of the State of California, ("District") and _____, ("Owner").

RECITALS:

1. District is engaged in the production, transmission and distribution of water within its service area.

2. Owner is developing a parcel of real property, commonly identified as Tract No. _____ ("Development") within the District's service area, as shown on Tract Map No. _____ on file in the office of the District and incorporated herein by reference.

3. Owner desires to secure water service to the Development from the District and the District is willing to provide such service on the terms and conditions set forth in this Contract.

4. Owner has provided to the District the plans for water system improvements for the Development ("Facilities") and Owner has granted to the District the easements required for the operation and maintenance of the improvements. Said plans and specifications include, where applicable, off-site facilities necessary to serve the Development.

5. On _____ _____, _____ the District approved said plans designated as Water System Improvements, Tract _____, which plans and specifications ("Plans") are attached as Exhibit 1.

6. Owner intends to construct the Facilities in accordance with the approved Plans, which Facilities will be connected to the District's system.

AGREEMENTS

1. Construction of Facilities. Within _____ calendar days from the date of this Contract, Owner shall secure all required permits and cause to be constructed the Facilities in accordance with the Plans.

   District reserves the right to approve all materials used in construction of the Facilities. All work shall be done to the satisfaction of the District and in a good

and workmanlike manner. All work shall be performed in accordance with District rules and regulations.

2. Qualifications of Contractor and Subcontractors. All work shall be performed by contractors approved by District and possessing that class of contractor's license issued pursuant to Division 3, Chapter 9, of the Business and Professions Code required for construction of the Facilities. Owner proposes to enter into an agreement with a general contractor ("Contractor") for construction of the Facilities. Prior to entering into such agreement, Owner shall secure from Contractor the following information for review and approval by the District:

   (a) Information regarding its experience, financial condition and business references to be set forth on Exhibit 2. Contractor shall have at least five years experience in performing similar work.

   (b) The Contractor's Licensing Statement in the form attached as Exhibit 3.

   (c) The names and addresses of subcontractors, if any who will perform work under the agreement between Owner and the Contractor or who will specially fabricate and install a portion of the work to be set forth on the form attached as Exhibit 4. The construction agreement shall provide that subcontractors may not be substituted without District's prior approval. Contractor may not subcontract for more than 40% of the work to be performed under its contract with Owner.

3. Inspection of Facilities. District shall at all times have access to the Development during construction of the Facilities as described in the General Provisions, Section 3.9.

4. Contract to be binding on Contractor. Owner shall furnish Contractor with a copy of this Contract and shall cause Contractor to acknowledge its agreement to be bound by the terms and conditions of this Contract. Owner shall have a written agreement with Contractor, which agreement shall incorporate by reference the terms and conditions of this Contract. A fully executed copy of the agreement between Owner and Contractor shall be delivered to District prior to commencement of work, and attached hereto as Exhibit 5.

5. Bonds Contractor shall furnish and deliver to the District bonds as required in Section 8 of the General Provisions.

   (a) Prior to Contractor's commencement of work, Contractor shall furnish and deliver to District a bond with a responsible corporate surety or corporate sureties acceptable to District conditioned upon the faithful performance of Contractor of all covenants and stipulations of this Contract, and of Contractor's agreement with Owner. Said bonds shall be in an amount that

is not less than 100% of the total amount payable under Contractor's agreement with Owner for the Facilities.

(b) Prior to commencement of work, Contractor shall also furnish to District a payment bond. Said payment bond shall be in a sum not less than 100% of the total amount payable under Contractor's agreement with Owner for the Facilities.

(c) The surety or sureties on all bonds furnished must be satisfactory to the District. If during the course of construction any of the sureties in the sole discretion of the District are or become insufficient, District may require additional sufficient sureties which the Contractor shall furnish to the satisfaction of the District within fifteen (15) days after written notice thereof.

6. Insurance Requirements of Owner. Prior to the commencement of work, Owner shall cause Contractor to forward to the District a policy or certificate of liability insurance as required in Section 7 of the General Provisions. The amount of coverage shall be no less than the following:

(a) General bodily injury and property damage - $2,000,000 per occurrence.

(b) Automobile bodily injury and property damage - $2,000,000 per occurrence, including owned, nonowned and hired autos, and providing coverage for loading and unloading.

7. Schedules and Notice. Owner shall provide District with a schedule for construction of the Facilities and shall keep District advised of the schedule and progress of work. **No work shall be performed** unless the notice and meeting requirements of Section 3.5 of the General Provisions have been met.

8. Inspection, Contract Administration, and Connection Fees. Upon execution of this Contract, Owner shall deposit with District the following amounts:

(a) Water service capacity charge in accordance with article 7.07 appendix B of the District's Policies, Rules and Regulations.

(b) Estimated engineering expenses calculated at three percent (3%) of Spec Sheet Cost _____

(c) The Owner will pay to District a fee equal to the greatest of (3%) of Facilities construction cost or $1500.00 to cover the costs to District for preparation of this Contract, and for any repairs to the improvements during the first two years after acceptance of Facilities by District. 2 year maintenance liability fee: $ _____

(d) Inspection costs calculated at three percent (3%) of the total cost of construction of the Facilities: $ _____

The Owner is responsible for payment of the full amount of any engineering and/or legal fees incurred by the District in connection with the Owner or the Development. To the extent such fees exceed the amounts estimated above, Owner agrees to pay such additional amount as may be required. To the extent the amounts deposited exceed the actual expenses incurred by the District, the District shall refund the difference. No interest shall be paid on any amounts deposited or refunded.

9. Payment for Work. All work related to the development and construction of the Facilities is for the convenience of and at the request of Owner, who shall be solely responsible for all costs and expenses in connection therewith, except as otherwise provided herein. District shall not be responsible to Contractor or its subcontractors, suppliers or materialmen for such work. Owner shall not permit any claim to be enforced against the Facilities, however it may arise. Regardless of the merits of any claim, Owner shall, within five (5) days of the assertion thereof, cause said claim to be discharged or provide a bond releasing such claim, in a form satisfactory to District.

10. No Agency. Neither Owner nor Contractor are the agents or representative of District. Neither has any authority to in any way commit or bind District.

11. Indemnification. Owner and Contractor shall meet the indemnity requirements of Section 6.10 of the General Provisions.

12. Compliance with Laws. The agreement between Owner and Contractor shall require that: (a) Contractor shall conduct its operations so as to avoid injury or damage to any person or property, and to minimize any obstruction and inconvenience to the public; (b) Contractor shall comply with all applicable laws or regulations relating to the work including safety measures applicable in particular operations or kinds of work; (c) Contractor shall provide and maintain such fences, barriers, directional signs, lights, and flag men as are necessary to give adequate warning to the public at all times of any dangerous conditions to be encountered as the result of the construction work and to give directions to the public; and (d) Contractor shall be solely and completely responsible for conditions of the job site, including safety of all persons and property during construction of the Facilities.

13. Maintenance and Repair of Facilities. Owner shall protect and maintain the Facilities through completion of the Development. In the event all or any part of the Facilities are damaged or destroyed, Owner shall repair or replace said Facilities without cost to District. The Facilities must be in good condition and working order before the District will accept the Facilities and provide water

service to the Development. Owner shall provide warranty and guarantees as described in Section 6.14 of the General Provisions.

14. Water Quality. District makes no representations or guarantees regarding the quality of water to be supplied to the Development. Owner acknowledges that it may be the nature of water to be corrosive, and it may have corrosive effects on certain water facilities, i.e., pipes, valves, materials, appliances and appurtenances. Owner further acknowledges that certain materials utilized for the conveyance of water may be more susceptible than others to corrosion and its related effects. The selection and installation of all piping, valves, materials, appliances, fittings and appurtenances required to receive and convey water from the discharge outlet of the meter to serve a particular lot, home, building, structure or parcel of land, within a subdivision or otherwise, is the sole responsibility of Owner. Any and all piping, valves, materials, appliances, fittings and appurtenances connected to the discharge outlet of the meter shall be designated as "on-site". District obtains and submits reports on the mineral and chemical analysis of water samples to the State of California Division of Drinking Water. Said reports are available to Owner upon request. Should Owner require any additional information or further mineral and chemical water analysis reports, Owner shall bear the expenses of producing such reports. Owner assumes responsibility for obtaining copies of District mineral and chemical water analysis reports for evaluation of potential corrosive tendencies and possible adverse effects to on-site water facilities. In selecting piping, valves, materials, appliances, fittings and appurtenances to be used for receipt of water from the discharge outlet of the meter, Owner shall consider the mineral and chemical content, and potential corrosive effects of any blend and/or percentage thereof, of water which may be supplied by District. Owner further acknowledges and agrees to indemnify and hold harmless District, and its officers, agents and employees from any and all adverse effects or damages that result from corrosion of on-site facilities, and in particular within any residence, commercial building or industrial building caused by Owner.

15. Flow Requirements. District neither guarantees nor agrees to supply water in any specific quantities or pressures for fire flow, domestic use, or for any other purpose whatsoever, and no such obligation shall be implied.

16. Construction Water. Owner and/or Contractor shall pay for the use of construction and irrigation water in accordance with District Policies, Rules and Regulations.

17. Rules and Regulations of Water District. Owner shall comply with all applicable District Policies, Rules and Regulations.

18. Environmental Compliance. Owner represents and warrants that Owner has obtained all required permits and approvals, or will have obtained all such permits and approvals, prior to commencement of construction, and that the Development

is in compliance with applicable subdivision law. Owner has completed, or is otherwise subject to, certain environmental documentation through other public agencies as lead agency, and the Development to be constructed has not substantially changed from that contemplated in the initial environmental review and approval process conducted by the lead agency. To Owner's knowledge, the review undertaken by the lead agency pursuant to the California Environmental Qualify Act has been completed and the Environmental Impact Report (if any) has been certified. Owner has provided District with copies of all environmental documents associated with the Development.

19. Notices to Purchasers. Owner shall give written notification to the purchasers of its lots and the purchasers of its homes of the location of District's easements and facilities on or adjacent to their property so that said purchasers will not interfere with access to District's facilities (for example by installing interfering walls, fences, gates or shrubbery).

20. Street Plans, Surveys, Record Drawings, Compaction Tests, and Bacteriological Tests. Not less than fifteen (15) days prior to commencement of construction, Owner shall provide to District the final approved tract map and a complete set of final approved plans and profile drawings for on-site and off-site water facilities which are prepared, approved and signed by a registered civil engineer and approved and signed by all applicable regulatory agencies. Plans shall be prepared as required by Section 2.2 of the General Provisions. Prior to commencement of construction, Owner shall provide accurate field staking, i.e., cut stakes, field stakes and final grade stakes (blue top hubs) based on final approved street plans. Owner shall provide District with compaction tests in accordance with County, City and District requirements. Upon completion of construction, Owner shall provide District with legible record drawings as required by Section 2.3 of the General Provisions showing all water facilities; said record drawings shall include a written narrative statement which clearly describes all modifications, changes or deviations from the approved plans. Upon completion of construction, Owner shall provide District with a minimum of two (2) consecutive bacteriological test results on all water facilities, the samples for which are collected in accordance with all applicable standards and regulations. Samples for bacteriological analysis shall be submitted to a laboratory approved by District. Samples shall be taken at least twenty-four (24) hours apart from one another. Should any tests fail or not be acceptable Owner shall take additional samples in accordance with all standards and regulations and the requirements of District and all regulatory agencies. Owner understands and agrees that water service cannot be provided to Owner's project unless and until all Facilities are completed in accordance with the Plans, transferred to District, and accepted in writing by District.

21. Donations and Acceptance of Facilities. Upon completion of construction, all Facilities connected to the District's distribution system shall be donated by the Owner to the District free and clear of all liens, claims and encumbrances and shall become the property of District upon acceptance of the Facilities for

operation, maintenance, and repair by the District. District may require Owner to provide a deed, bill of sale, or other instrument of conveyance, conveying the Facilities from the Owner to the District.

22. Attorneys' Fees. In any action, at law or in equity, including an action for declaratory relief, seeking to interpret or enforce the terms of this Contract, the prevailing party shall be entitled to recover a reasonable amount as attorneys' fees and costs incurred in prosecuting or defending such action, including a dispute submitted to arbitration, in addition to any other relief to which such party is entitled.

23. Not Assignable. The rights and obligations of Owner and Contractor under this Contract shall not be assignable without the prior written consent of District.

24. Entire Agreement. This Contract, along with the District Specifications for Developers and Contractors for Domestic Water Systems incorporated by reference, constitutes the entire Agreement of the parties with respect to the subject matter, and no amendment, modification or alteration of the terms hereof shall be binding unless the same is in writing, dated subsequent to the date hereof and duly approved and executed by each of the parties.

25. Choice of Law. This Contract, and the application or interpretation hereof, shall be governed exclusively by its terms and by the laws of the State of California. Venue for all purposes shall be deemed to lie within Los Angeles County, California, and any action to enforce this Contract or for any remedies, damages, or other relief shall only be brought in either the State courts of the State of California in and for the County of Los Angeles or in the United States District Court, Central District of California.

IN WITNESS WHEREOF, the parties have caused this Contract to be executed as of the day and year first above written.

"DISTRICT" **"OWNER"**

By: _____
General Manager

By: _____

Its _____
[TITLE]