SECTION 5
DESIGN STANDARDS

5.0 GENERAL

The scope of water system improvements shall be determined during predesign and by the system hydraulic analysis for the project. Unless otherwise specified, the Developer shall be responsible for preparation of plans and construction of improvements for all project-required facilities. Project facility design requirements are presented in the following paragraphs:

5.1 PIPELINE MATERIALS

Pipelines shall be constructed of ductile iron pipe and fittings conforming to AWWA C104 and all other applicable AWWA standards including but not limited to C105, C110, C111, C115, C150, C151, C153, C600 and C606.

5.2 WATER MAIN LOCATION

Main extensions should be located within a dedicated right-of-way. If a dedicated right-of-way is not available, the main may be located elsewhere upon SBMWD approval and upon the granting of an easement to SBMWD. The easement shall be twenty-five (25) feet or greater in width unless otherwise approved by SBMWD. Waterlines shall be designed to be a minimum of ten (10) feet from the property line or easement edge or as specified by SBMWD for the entire water main length. Other utilities may be located in the same easement if all Title 22 separation requirements are met.

Where street curbs are present, mains will be located in the street seven (7) feet from the back of curb. In areas without curb and gutter, the mains will be located a minimum of fourteen (14) feet from the right-of-way edge unless established otherwise by SBMWD.

Mains should be located at a distance no less than three (3) feet horizontally from any gas line, ten (10) feet horizontally (pipe wall to pipe wall) from any non-potable waterline (reclaimed) or sewer line (sanitary or storm), and twelve (12) inches vertically above any non-potable

waterline or sewer line. Location of other utilities in the easements should be coordinated with the Agency on an individual basis.

If the vertical distance of twelve (12) inches between the waterline installed over a non-potable waterline or sanitary or storm sewer line cannot be maintained, the criteria for water/non-potable waterline or sewer main separations in Title 22 must be complied with.

Mains should not have a vertical slope of zero, in the vertical profile design or during installation, unless specifically approved by the Department's representative.

Dead-end mains shall be minimized by looping mains whenever practical.

Mains installed in a cul-de-sac shall run the full street length ending approximately fifteen (15) feet from the property's front edge at the end of the cul-de-sac, unless they are looped.

5.3 FULL FRONTAGE EXTENSION

Waterlines shall be required at SBMWD's discretion along the entire length of at least one property line frontage of the property to be served. The property line frontage is that portion of the property along the public right-of-way. If a parcel to be developed has more than one property line frontage, SBMWD shall require a waterline to be installed along the other frontage(s). The minimum pipe diameter required in the frontage street shall be in accordance with Section 2.1.5.2 or as required by SBMWD.

5.4 WATER MAIN JOINT DEFLECTION

The maximum allowable water main joint deflection for ductile iron pipe materials and lengths is listed in the following table. If these offsets conflict with the pipe manufacturer's recommendation, the more stringent requirement shall apply. Requirements in excess of these deflections identified shall require installation of fittings.

PUSH-ON TYPE DIP JOINT					
Pipe Size (Inches)	Deflection Angle (Degrees)	Maximum Offset (Inches)		Minimum Radius of Curvature (Feet)	
		18′ Length	20′ Length	18′ Length	20′ Length
4″-12″	3.0°	11″	13″	344′	382′
14″-24″	1.5°	6″	6″	690′	765′

MECHANICAL TYPE DIP JOINT					
Pipe Size (Inches)	Deflection Angle (Degrees)	Maximum Offset (Inches)		Minimum Radius of Curvature (Feet)	
		18′ Length	20′ Length	18′ Length	20′ Length
4″	4.0°	15″	17″	260′	290′
6″	3.5°	13″	15″	295′	330′
8″-12″	2.5°	9″	10″	415′	460′
14″-24″	1.5°	6″	6″	690′	765′

Pipe sizes not shown shall be in strict conformance with the manufacturer's most stringent standards.

5.5 DEPTH OF COVER

The minimum depth of cover shall be maintained for all pipe unless otherwise specified. Vehicle traffic over the water mains may be restricted until the minimum depth of cover is obtained. A thirty-six (36) inch minimum depth of cover must be maintained from top of pipe to finish grade. The depth of cover required shall be determined by the physical pipe properties, site conditions, manufacturer’s recommendations, and construction practices.

5.5.1 RIGHT-OF-WAY WITHOUT AN ESTABLISHED STREET GRADE

A sixty (60) inch minimum depth of cover shall be maintained over any pipe where there is not an established street grade. The Engineer shall consider possible, and probable, future development and grading to achieve the minimum depth of cover as described in the following Section.

5.5.2 RIGHT-OF-WAY WITH AN ESTABLISHED STREET GRADE

Pipe Diameter (Inches)	Minimum Depth of Cover (Inches)
Twelve (12) and smaller	Thirty-six (36)
Greater than twelve (12)	Forty-two (42)

5.6 PIPE CASING

Pipe casing shall be steel. Casings are required on all pipes installed using boring method, where required to meet specific Railroad and/or Caltrans or any other governing agency requirements, to provide structural support, or as required under other special conditions.

5.7 VALVES

5.7.1 VALVE LOCATION

Sufficient valves shall be provided on water mains to minimize inconvenience, degradation of fire protection, and sanitary hazards during repairs. Valves shall be generally located as follows, unless otherwise approved by SBMWD:

A. At intervals to isolate no more than two (2) fire hydrants at any time.

B. At minimum intervals of one thousand (1,000) feet for transmission mains in commercially/ industrially zoned areas, and residential off-site water mains.

C. In residential areas to isolate a maximum of thirty (30) services (approximately 500 feet).

D. A maximum of five (5) valves will be required to isolate any location.

E. Valves shall not be located in street gutters, valley gutters, or in driveways.

F. A valve is required at the end of all temporarily dead-end mains. The valve location is to be a minimum of ten (10) feet upstream of the cap or blow off assembly.

G. Valved outlet(s) for future service laterals six (6) inches in diameter and larger may be installed when approved by SBMWD. Valved outlet installation approval does not constitute a water commitment. When used, the following note shall appear on the drawing:

CONDITIONAL APPROVAL OF VALVED OUTLET (6" and larger)

The water plans show one or more valved outlets extending out of paved areas. Installation of these outlets is acceptable; however, if the outlets are incorrectly located or not used for any reason when the property is actually developed, the Developer shall abandon the outlets at the connection to the active main in accordance with SBMWD's Standards and at the Developer's expense. Approval of the valved outlet does not provide or imply a water commitment.

H. A shut off valve shall be provided for all service laterals per SBMWD Standard Drawings, and for all fire hydrant laterals.

I. SBMWD may require additional valves depending upon the project design.

5.7.2 GATE VALVES

A. Gate valves may be used on all water main diameters up to, and including, eight (8) inches, (Exception: Tapping valves of any size).

B. Gate valves shall be installed in the vertical position with non-rising stems in all locations, except vaults.

B. Gate valves shall be installed in the vertical position with non-rising stems in all locations, except vaults.

C. All gate valves shall be resilient seat unless otherwise specified by SBMWD.

5.7.3 BUTTERFLY VALVES

Butterfly valves may be used on water mains twelve (12) inches in diameter and larger, unless a tapping (gate) valve is required, or as required by SBMWD.

A minimum six (6) inch bypass valve and piping for pressure relief shall be provided for all butterfly valves twenty-four (24) inches in diameter and greater. Butterfly valves twenty-four (24) inches and larger shall be installed in pre-cast concrete vaults.

5.7.4 VALVE STEM EXTENSIONS

Valve stem extensions are required within two (2) feet of finished grade where the distance from the top of the valve box to the top of the operating nut exceeds five (5) feet.

5.7.5 VALVE BOXES

Adjustable valve boxes shall be provided for all buried valves. Valve boxes shall be installed in accordance with Standard Drawings W3.1 and W3.2.

5.7.6 SPECIAL VALVES

A. Air relief or combination air/vacuum relief valves will be required on pipelines' high points and changes in grade, depending on the main size and terrain, in accordance with Standard Drawings W7.1, W7.2, and W7.3.

B. Pressure regulating valves (PRV) or pressure sustaining valves (PSV) will be required where it is necessary to reduce pressure to a maximum value or maintain upstream pressure as defined in Section 2.1.5.1 -

System Pressure Requirements, of these standards.

C. Check valves are to be used where it is required that the water flow in one direction only, as approved by SBMWD.

D. Blow-off valves are required on all permanent dead-end pipe runs and may be required at stub-out locations. Blow-off valves for these locations shall be installed in accordance with Standard Drawing W6.18. Six (6) inch manual blow-off valves for installation at low points shall be installed as a standard fire hydrant in accordance with Standard Drawing W2.2 for pipe diameters equal to or less than twelve (12) inches where determined appropriate by SBMWD. Manual blow-off assemblies shall be sized and calculations submitted to the SBMWD Engineer for approval for all pipeline diameters twelve (12) inches and greater. Any services near a dead-end main shall be installed on the end cap or plug where appropriate.

E. Backflow Prevention Assembly requirements are identified in Section 5.13 - Backflow.

5.7.7 VALVE ABANDONMENT

A. Any valved outlet installed prior to lot development, and subsequently not required, must be abandoned.

B. For valve abandonment, the following note shall appear on the drawing:

ABANDONED VALVES

All valves to be abandoned shall be abandoned in the closed position, unless shown otherwise, by removing a minimum of the top twenty-four (24) inches of the valve box and then filling the bottom of the box with a minimum of eight (8) inches of sand,

the remaining portion of the valve box shall be filled with concrete having a compressive strength of at least two thousand (2,000) psi. The lateral must be completely removed from the abandoned valve and capped with a blind flange or plug.

5.8 THRUST AND ANCHOR BLOCKS

Thrust blocks are only required for hot taps or in special cases as approved by SBMWD per Standard Drawing W6.4A.

5.9 MECHANICALLY RESTRAINED JOINTS

Mechanically restrained joints shall be used on all DIP fittings. The length of restrained joints should be clearly identified on drawings. For pipe sizes greater than sixteen (16) inches, calculations shall be submitted justifying the restrained lengths.

5.10 SERVICE LATERALS

5.10.1 LOCATION

A. All service laterals shall be installed in the right-of-way unless other provisions have been approved by SBMWD.

B. The full-service lateral length between a water main and water meter shall be installed at ninety (90) degrees to the water main horizontal alignment unless otherwise approved by SBMWD.

C. For service laterals two (2) inches in diameter and smaller, service saddles shall not be closer than eighteen (18) inches from the end of the main, nor closer than eighteen (18) inches to any other service saddle or pipe joint. Service lateral will be allowed to be installed to the blind flange or plug of a dead-end main where appropriate.

D. The sewer and water laterals leading into the property shall be separated horizontally by a minimum of five (5) feet, the sewer

lateral must be a minimum of one (1) foot lower than the water lateral, and the laterals shall be located in separate trenches, per State and local health requirements (See Section 5.2).

E. All service laterals shall be located a minimum of ten (10) feet from septic tanks, and a minimum of twenty-five (25) feet from leach beds and/or seepage pits.

5.10.2 LATERAL INSTALLATION

A. Service saddles shall be installed in accordance with SBMWD's approved materials list for the type of pipe used.

B. Corporation stops shall be male iron pipe thread by compression or flared connection. A corporation stop shall be installed at the water main for all service laterals two (2) inches and smaller.

C. All service laterals two (2) inches and smaller shall have a minimum lateral diameter equal to the service size but in no case shall the lateral diameter be less than one (1) inch (i.e., a 1" diameter service lateral is required for 5/8", 3/4", and 1").

D. All services three (3) inches and larger shall include valves as shown on SBMWD's service standard drawings.

5.10.3 LATERAL REMOVAL (SERVICE KILLS)

A. When abandoning existing water service assemblies sized two (2) inches and smaller, the following note shall appear on the drawing:

ABANDONMENT OF EXISTING SERVICE LATERALS (2" and smaller) (Reference Standard Drawing W1.16)

The Contractor shall notify SBMWD two (2) full business days <u>prior</u> to the requested removal time to allow SBMWD to take the final service reading. The Contractor may then begin removal procedures for the affected service as follows:

Existing service laterals to be abandoned from existing water mains shall have the corporation stops turned off at the main, a minimum of twelve (12) inches of the lateral cut out near the corporation stops, and a brass cap or plug installed on the corporation stop. If the corporation stop is damaged beyond repair or pulled from the existing water main, the main shall be repaired at the Contractor's expense in a manner approved by SBMWD. If it is discovered the corporation stop is not watertight, through no fault of the Contractor, the Contractor shall notify SBMWD for further direction. The existing service(s) shall be removed and recycled. The SBMWD may require reusable components (meters, etc.) to be delivered to SBMWD.

B. For existing water service assemblies three (3) inches and larger that are to be abandoned, the following note shall appear on the drawing:

<u>ABANDONMENT OF EXISTING SERVICE LATERALS (3" and larger)</u>

The Contractor shall notify SBMWD two (2) full business days <u>prior</u> to the requested removal time to allow SBMWD to take the final service reading and to notify SBMWD's Inspector of the impending work. The Contractor may then begin removal procedures for the affected service as follows:

All valves to be abandoned shall be abandoned in the closed position, unless shown otherwise, by removing a minimum of the top twenty-four (24) inches of the valve

box and then filling the bottom of the box with a minimum of eight (8) inches of sand, the remaining portion of the valve box shall be filled with concrete having a compressive strength of at least two thousand (2,000) psi.

If the valve is to be abandoned in the closed position, the lateral must be cut within three (3) feet of the abandoned valve, or as shown on plans, and capped. Where a joint or coupling in the existing pipe is uncovered at the cut and cap locations, the installation of a restrained plug may be permitted with SBMWD approval. The Contractor shall install a concrete thrust block in accordance with the provisions of the SBMWD Standard Drawing W6.4A at all cap or plug locations.

The existing service(s) shall be removed and recycled. The Contractor shall then remove and/or backfill the abandoned vault with select material and restore all damaged surface features as directed by SBMWD.

5.10.4 LATERAL RELOCATION

A. All existing laterals that are to be relocated must first be disconnected from the existing pipeline following abandonment procedures (see Section 5.10.3). The relocated service installation shall comply with SBMWD's Standard Drawing W1.17.

B. If meter box relocation is required, Section 5.11.4 shall apply.

C. The lateral may be extended, rather than replaced, if the existing lateral is of approved copper material or ductile iron pipe, provided the ninety (90) degree angle from the existing water main is maintained. All polyethylene or PVC tubing service laterals must be fully replaced, in lieu of extension or splicing, to SBMWD's current standards.

5.11 METERS

5.11.1 SIZE

The final meter to be installed will be based on size and service requirements. **Final meter selection approval is SBMWD's responsibility.** Approved water meter sizes and capacities are shown on Standard Drawing W1.15. The size for all domestic services shall be based on continuous flow meter capacities when utilizing Peak Hour Demand. Maximum meter flow capacities may be used for maximum domestic demands, when calculated utilizing the applicable plumbing code or other applicable criteria, and fire flow conditions when associated pressure losses are accounted for in the system design.

5.11.2 AGENCY PROVIDED METERS

A. All meters two (2) inches and smaller are provided by SBMWD and remain SBMWD's property.

B. All meters three (3) inches and larger shall be provided by the developer and must meet the requirements of, be approved by, and remain the property of SBMWD. The SBMWD may elect to provide any size meter at the Developer's expense.

5.11.3 INSTALLATION

A. All services shall be installed in accordance with SBMWD Standard Drawings and Specifications. Meters will not be allowed at locations not contiguous to the property served.

INSTALLATION OF METER AND VAULT

The meter(s) and vault(s) with traffic/non-traffic bearing cover(s) shall be installed in accordance with the Standard Drawings and Specifications. Pre-cast vaults approved by SBMWD may be used in lieu of the fiberglass vaults. The designation of pre-cast or cast-in place must be made prior to plan approval.

Any block wall or other fence material shall be designed and constructed around the outside of the easement(s), to allow SBMWD direct access to the vault(s) and inlet piping from the adjacent right-of-way.

Easements shall be clearly marked or staked prior to the start of construction.

INSTALLATION DOUBLE CHECK DETECTOR CHECK ASSEMBLY

The detector check(s) shall be installed in accordance with the Standard Drawings.

Easements shall be clearly marked or staked prior to the start of construction.

B. A bypass line or bypass provision is required for all meters three (3) inches and larger on projects without redundant services, unless otherwise specified by SBMWD.

C. All meter and meter vaults for services three (3) inches and larger shall be located outside of the right-of-way (even if there is adequate space for the vault within the right-of-way) and the appropriate utility easement granted to SBMWDunless otherwise specified by SBMWD.

5.11.4 METER BOXES

A. All meter boxes shall be located in the sidewalk, sidewalk area, or within a designated easement in accordance with the Standard Drawings. Meter boxes shall not be located in driveways or streets.

B. All meters two (2) inches and smaller shall be installed in an approved meter box, sized per the corresponding Standard Drawing.

C. All meters three (3) inches and larger shall be housed in a vault. Refer to Standard Drawings W1.4 and W1.5 for dimension and construction details.

D. Provisions for remote reading devices for all vaults may be required when vault or meter box access has restrictions or as required by SBMWD.

5.12 EXISTING/ABANDONED PRIVATE WELLS

5.12.1 EXISTING PRIVATE WELLS TO REMAIN IN SERVICE

The following note shall appear on the drawing:

EXISTING PRIVATE WELLS TO REMAIN IN SERVICE

If the existing private well is to remain in service, SBMWD approved backflow prevention assembly shall be installed immediately downstream of SBMWD's water meter in accordance with Standard Drawing W4.2. The new service shall not be activated until the backflow prevention assembly has been successfully tested by SBMWD.

5.12.2 PRIVATE WELLS TO BE REMOVED FROM SERVICE

The following note shall appear on the drawing:

PRIVATE WELLS TO BE REMOVED FROM SERVICE

If the existing private well is to be abandoned, the installation of a backflow prevention

assembly will not be required; however, SBMWD water service will remain in the off position and locked out until the well has been abandoned. An inspection of the on-site system will be made by SBMWD's Inspector to verify the well has been disconnected from the on-site system and the well is no longer functional.

5.13 BACKFLOW

Any connection to SBMWD's distribution system shall be made in a manner that protects the public potable water supply from contamination or pollution. Containment shall be achieved by the use of SBMWD approved backflow assembly that isolates, within the customer's internal distribution system(s) or the customer's private water system(s), such contaminants or pollutants that could backflow into the public water system.

5.13.1 APPLICATION

No water service connection to any premises shall be approved, installed, or maintained by SBMWD unless the water supply is protected as required by State laws, State regulations, and SBMWD Standards. Water service to any premises shall not be activated by SBMWD if SBMWD determines the water service requires a backflow assembly and any of the following conditions prevail:

A. The backflow assembly is not installed or has been removed after installation.

B. The backflow assembly has been by-passed.

C. The backflow assembly is in any way altered.

D. Any cross-connection exists or possibility of cross-connection exists.

E. The backflow assembly receives an "unsatisfactory" test result.

The required backflow prevention assembly type shall be determined by facility use. Facilities shall be evaluated by SBMWD for backflow prevention requirements on a case-by-case basis.

Any backflow prevention assembly required herein shall be a model and size approved by SBMWD. The term "Approved Backflow Prevention Assembly" shall mean an assembly meeting SBMWD's Standard Specifications and Drawings.

When backflow prevention assemblies are required, their installation design shall take into consideration pressure loss across the device and maintenance requirements for critical services. Parallel assembly use should be considered to prevent service disruption during scheduled maintenance.

5.14 FIRE HYDRANTS

5.14.1 LOCATION, SPACING, AND TESTING

A. All fire hydrants, permanent or temporary, will be installed in accordance with Standard Drawing No. W2.2.

B. All new fire hydrants will have a fire flow test performed by the developer under the inspection of the SBMWD in accordance with the AWWA M17 test procedure. Flow data (GPM) at 20 psi will be submitted to the SBMWD along with required Pitot, static, residual, flowed opening, location information, and an 8½" X 11" map with both flowed and gauged hydrant information. The SBMWD Principal Engineer has the discretion to limit the number of tests for water conservation purposes. Once the test results are delivered to and reviewed by the SBMWD Engineering Department all hydrants are to be taped per SBMWD W2.2 & W6.3 before beneficial use of any new hydrant.

C. Hydrant spacing and location are ultimately determined by the Fire Department having jurisdiction.

D. Fire hydrants shall be located as specified by SBMWD and shall not be located in the following locations:

1. Within six (6) feet of driveway, power pole, light standard, or any obstruction.

2. More than ten (10) feet into a cul-de-sac from the beginning of curb radius.

3. Within three (3) feet of any block wall or fence.

5.14.2 MATERIALS

Fire hydrants shall be approved by, and conform to the requirements of, the Fire Department.

5.14.3 RELOCATION/ABANDONMENT

A. If a hydrant lateral needs to be lengthened, continuing further back in the same direction, and at the same depth as the original lateral, the hydrant assembly may be disconnected, the lateral lengthened and the assembly reconnected. The following note shall appear on the drawing:

RELOCATION OF FIRE HYDRANTS
(Extension of Existing Lateral)

The Contractor shall remove and relocate both the upper and lower barrels of the existing fire hydrant(s) where shown, extend the existing lateral as required, and reinstall such hydrant(s) at the new location(s) indicated. Fire Hydrants shall be tested prior to and after relocation under the direction of SBMWD to ensure quality. Installation shall be in accordance with Standard Drawing W2.2. Laterals made of unapproved materials shall be replaced from the main to the fire hydrant.

B. If a hydrant is to be relocated and the hydrant lateral must be abandoned, the following note shall appear on the drawing:

FIRE HYDRANT RELOCATION AND LATERAL ABANDONMENT (Existing Lateral to be Abandoned)

Where shown on the drawing(s), the Contractor shall abandon the existing fire hydrant(s) by removing both the upper and lower barrels and lateral of the fire hydrant to the fire hydrant valve adjacent to the main. Fire Hydrants shall be tested prior to and after relocation under the direction of SBMWD to ensure quality of the fire hydrant(s). The existing hydrant shall be installed at the new location as indicated on the drawing, in accordance with Standard Drawings W2.1 and W2.2. The existing valve shall be abandoned in a closed position, unless shown otherwise, by removing a minimum of the top twenty-four (24) inches of the valve box, and then filling the bottom of the box with a minimum of eight (8) inches of sand or approved aggregate base, the remaining portion of the valve box shall be filled with concrete having a compressive strength of at least two thousand (2,000) psi. The lateral shall be cut within three (3) feet of the abandoned valve, or as shown on plans, and capped. Where a joint or coupling in the existing pipe is uncovered at the cut and cap location, the installation of a plug may be permitted, with SBMWD approval. A concrete thrust block shall be installed at all cut and cap locations in accordance with the provisions of Standard Drawing.

C. If the fire hydrant is to be abandoned, the following note shall appear on the drawing:

FIRE HYDRANT AND LATERAL ABANDONMENT

Where shown on the drawing, the Contractor shall abandon the existing fire hydrant(s) by removing both the upper and lower fire hydrant barrels and lateral of the fire hydrant to the fire hydrant valve adjacent to the main. The existing hydrant may be delivered to the SBMWD at the SBMWD's own discretion. The existing valve shall be abandoned in a closed position, unless shown otherwise, by removing a minimum of the top twenty-four (24) inches of the valve box and then filling the bottom of the box with a minimum of eight (8) inches of sand or approved aggregate base, the remaining portion of the valve box shall be filled with concrete having a compressive strength of at least two thousand (2,000) psi. The remaining portion of the lateral shall be cut within three (3) feet of the abandoned valve, or as shown on plans, and capped. The existing concrete hydrant pad shall be removed.

D. VERTICAL ADJUSTMENTS

Where grades are changed which affect fire hydrants, the Contractor shall make adjustments as necessary to bring the fire hydrant into compliance with Standard Drawings W2.1 and W2.2.

5.14.4 FIRE DEPARTMENT APPROVAL

Approval by the Fire Department having jurisdiction is required PRIOR to obtaining final water plan approval from the Agency.

5.15 WATER AND SEWER/STORM MAIN CROSSINGS AND CLEARANCES

5.15.1 PARALLEL SEPARATIONS (MAINS)

The separations required by Title 22 State Water Resources Control Board, Division of Drinking Water (attached in Appendix 'M' or most current

version) must be maintained between all storm and sanitary sewer lines, which parallel waterlines.

5.15.2 CROSSING SEPARATIONS (MAINS)

A minimum of twelve (12) inches of separation is allowed with special provisions according to Title 22 must be maintained between all storm and sanitary sewer mains, which cross water mains.

5.15.3 SERVICE LATERAL CROSSINGS AND CLEARANCES

For purposes of this section "service laterals" are those sewer and waterlines extending from a main and terminating on-site. They are generally of smaller diameters (water: 1" to 4"; sewer: 4" to 6").

A. PARALLEL SEPARATION (SERVICE LATERALS)

1. Water and sewer service laterals shall be installed at a minimum of sixty (60) inches apart in separate trenches. Water laterals shall be a minimum of twelve (12) inches above the sewer lateral (Ref.: "Plumbing Code").

2. For maintenance purposes, service laterals shall be installed a minimum of ten (10) feet from the exterior of the manholes.

B. CROSSINGS (SERVICE LATERALS)

1. Where a water service lateral crosses a sewer main or sewer lateral, it shall be above the sewer with a vertical separation of at least eighteen (18) inches. Any relocation of existing water laterals to achieve this clearance must be performed with the approval of and in accordance with the procedures and standards of SBMWD.

2. When a sewer main or sewer lateral must cross over or under a water lateral or water main with less than eighteen (18)

inches clearance, the provisions of Section 5.15.1 through Section 5.15.3 shall apply.

5.16 HOT TAPS 4-INCHES AND LARGER

5.16.1 MATERIALS

Mechanical joint or other SBMWD approved, tapping sleeves and valves shall be used for hot taps where the tap diameter is greater than seventy-five (75) percent of the nominal pipe diameter being tapped.

5.16.2 IDENTIFICATION

The steel cylinder thickness, as well as the mortar lining and coating thickness, must be noted on all project plans where CML/CMC WSP mains are to be tapped.

5.16.3 INSTALLATION

A. Wet taps shall be in accordance with SBMWD's requirements.

B. The minimum tapping pit size required is four (4) feet parallel and eight (8) feet perpendicular from the face of the tapping valve to the back of the tapping pit.

5.17 LINE STOPS

Line stops may be required by SBMWD, with or without a bypass, to ensure continuous operation of the water system. Line stops are used to temporarily shut down a pipeline system to complete modifications or repairs. They allow a system to operate without any interruption of service.

5.18 EASEMENTS

5.18.1 GENERAL REQUIREMENTS

A. Easements, where identified and allowed by SBMWD, are required whenever the water main, service lateral, meter, backflow assembly, or any associated appurtenances are not located in a public right-of-way. All easement locations shall be identified on the water plan, as well as any area(s) dedicated as public utility easements to be occupied by water facilities, to facilitate field verification.

B. Trees, shrubs, or decorative rocks, and any block wall or other fence material, shall be designed and constructed around the easement(s) to allow SBMWD direct access to the vault(s), backflow assemblies, and piping from the adjacent right-of-way.

C. The area within the easement shall be graded to provide drainage away from the vault and/or backflow assembly (ies) to prevent vault flooding and provide access for maintenance.

D. The area within the easement shall not contain any grades or materials such as large rocks (greater than two inches) that would hinder or restrict maintenance of the facilities.

E. The final grade within the easement shall be at an elevation equal to back of sidewalk/right-of-way to allow safe ingress/egress to facilities. Retaining walls shall be provided when required, and a minimum distance of three (3) feet will be provided from the edge of the pad(s) or vault to any fence or wall.

F. SBMWD may identify other specific requirements or limitations for easements.

5.18.2 SIZE

A. The easement size required for a water main will be per Section 5.2, or as specified by SBMWD.

B. The following chart identifies the minimum easement dimensions for various size meter configurations and meters.

METER SIZE	METER TYPE	MINIMUM EASEMENT REQUIRED
		METER
3" and 4"	Combination	10' x 15'
6"	Combination	10' x 20'
3"	Domestic Service	10' x 20'
4"	Domestic Service	10' x 15'
6"	Domestic Service	15' x 20'

5.18.3 APPROVAL REQUIREMENTS

A. PRELIMINARY APPROVAL

Preliminary plan technical approval may be obtained after submitting the water plans for plan check and making all the required changes as requested by SBMWD. The preliminary approval will state:

"This project water plan complies with SBMWD technical requirements. However, this water plan is NOT APPROVED FOR CONSTRUCTION at this time and this signature does not provide or imply a water commitment."

The project fees, applications, agreements, and/or easements are not required at this time. Final approval must be obtained before construction is initiated.

B. FINAL APPROVAL

The requirements of the final submittal are outlined in Section 4.0.

1. All plans submitted to SBMWD must be signed and have the stamp of a Civil Engineer who is licensed within the State of California.

2. The Developer's Engineer will submit the original plans for SBMWD approval. A Mylar copy must be submitted at the time of approval for all subdivisions, water main extensions, or service connections. SBMWD will retain this Mylar copy. A digital submission of the utility plan is also required. Standards for this submission are established in Section 4.0.

3. Prior to Agency water plan approval, applications, fees, and required easements must be submitted and accepted by SBMWD.

4. Approval of the Fire Department having jurisdiction must be obtained PRIOR to SBMWD's approval of the final water plan.

5.18.4 EXPIRATION DATE

Construction must commence within one (1) year of the approval date shown on the plans and must be diligently pursued to completion or the project may be subject to cancellation and must then be resubmitted for review and approval in accordance with SBMWD's Service Rules and requirements.

5.19 STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION (CALTRANS) PERMITS

A State Highway Encroachment Permit is required when working within the right-of-way of any State owned or maintained road. The Developer or Engineer will apply to the State for an Encroachment permit on behalf of SBMWD prior to obtaining approved water plans, and a check made payable to the State of California Department of

Transportation (Caltrans) for the application fee. An easement for the Agency should be obtained from any underlying fee owner in the event Caltrans does not own the full fee simple interest in the right-of-way. Prior to performing any work within the right-of-way, approval by the State must be received. The following note shall appear on the drawing:

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION (CALTRANS) PERMIT REQUIRED

An approved Caltrans Occupancy Permit shall be obtained through SBMWD prior to any construction within Caltrans right-of-way. Plans showing work in Caltrans right-of-way must show Caltrans stationing. The developer assumes all liability for work conducted under SBMWD obtained permit through warranty expiration.

5.20 HORIZONTAL PROJECT CONTROL SURVEYS

Horizontal project control surveys establish control for water improvement projects. All subsequent horizontal surveys for a project are based on the horizontal project control.

5.20.1 METHODS

Whenever feasible, horizontal project control shall be established using GPS survey methods. When GPS survey methods cannot be used for all or part of a horizontal project control survey, the Total Station Survey System (TSSS) system can be used.

5.20.2 ACCURACY

Horizontal project control surveys must be referenced and adjusted to California High-Precision Geodetic Network (HPGN) and/or HPGN-D stations. Preferred order of accuracy is first-order survey standards with a distance accuracy standard of 1:100,000 in accordance with Caltrans standards. Second-order accuracy standard (1:20,000) is acceptable when using the TSSS method.

5.20.3 MONUMENTATION

- Establish sufficient monuments so that a minimum of three monuments exist for each project.

- Set monuments as required by project conditions, generally no more than 1/2 mile apart. If longer spacing is used, establish monuments in pairs for intervisibility. Minimum spacing for monuments is 500 feet (1,000 feet when using GPS).

- Locate monuments to minimize disturbance by construction and to be clear of traffic and accessible, preferable within a public right of way or easement.

- Locate monuments so they are intervisible with at least two other monuments.

  Establish durable, permanent monuments with SBMWD markings. The preferred monument is the concrete monument with brass disk shown on Standard Drawing No. W6.2. Other acceptable monuments are 2-inch galvanized steel pipe 30-inches long, with brass disk or plastic plug, 5/8" diameter rebar, 30-inches long with cap, brass disk epoxied in rock mass or bridge abutment, existing stable monuments, etc.

5.21 VERTICAL PROJECT CONTROL SURVEYS

A vertical project control survey shall be performed for each specific SBMWD water project that requires elevations to define topographic data points or positions of fixed works. The establishment of vertical project control monuments shall establish a basis and control for all subsequent project surveys requiring elevations.

Vertical control for projects shall be established at all horizontal control stations. Additional benchmarks shall be set to densify vertical control to provide convenient control for photogrammetry, topographic, and construction purposes.

5.21.1 METHOD

Vertical Project Control can be established using the following methods:

- Differential leveling.
- Trigonometric leveling.
- GPS can be used to bring NAVD88 to a project.

5.21.2 ACCURACY

Accuracy standard shall be second-order survey accuracy in accordance with Caltrans standards, although third-order accuracy is acceptable.

5.21.3 MONUMENTATION

- Monuments should be spaced as required by project conditions, generally no more than 1/2 mile apart.

- Whenever feasible, utilize horizontal project control monuments as vertical control monuments.

- Locate monuments to minimize disturbance by construction and to be clear of traffic and accessible, preferably within a public right of way or easement.

- When feasible, establish a monument at each major structure.

- Establish durable, permanent monuments with SBMWD markings. The preferred monument is the concrete monument with metal disk shown on Standard Drawing W6.2. Other acceptable monuments are 2-inch galvanized steel pipe 30-inches long, with brass disk or plastic plug, 5/8" diameter rebar, 30-inches long with cap, brass disk epoxied in rock mass or bridge abutment, existing stable monument, etc.