BELLA VISTA WATER DISTRICT
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Bella Vista Water District

Design Standards

Adopted: July 22, 2024

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SECTION 1

PURPOSE AND DEFINITIONS

1-1 Purpose. The purpose of these Design Standards is to provide minimum standards to be applied to improvements which are to be dedicated to the public and accepted by the District for operation and maintenance, to certain private works, as well as improvements to be installed within existing rights-of-way and easements. This is necessary in order to provide for coordinated development of required facilities to be used by and for the protection of the public. These Standards shall apply to, regulate, and guide preparation of the design and preparation of plans for construction of water supply facilities and related public improvements.

1-2 Design Practice. Because it is virtually impossible to anticipate all situations that may arise or to prescribe standards applicable to every situation, any items or situations not included in these Design Standards shall be designed in accordance with accepted engineering practice, the Bella Vista Water District Standard Construction Specifications, the American Water Works Association (AWWA), and as specified by the District Engineer.

The District Engineer may require additional standards and/or regulations not inconsistent herewith when deemed necessary to protect the health, safety, and welfare of the public.

1-3 Definitions. Whenever the following terms or titles are used in these standards or in any document or instrument where these standards govern, the intent and meaning shall be as herein defined:

A. Applicant – shall mean the same as the Developer or his consulting engineer working on his behalf.

B. District – shall mean the Bella Vista Water District and its applicable departments.

C. District Engineer – shall mean the District Engineer of the Bella Vista Water District acting either directly or through the staff.

D. Consulting Engineer – shall mean any person or persons, firm, partnerships or corporation legally authorized to practice civil, mechanical, or electrical engineering in the State of California who prepares or submits improvement plans and specifications to the Bella Vista Water District for approval.

E. Contractor – shall mean any person or persons, firm, partnership, corporation, or combination thereof, licensed to perform the type of work involved, who has entered into a contract with any person, corporation or company, or his or their legal representatives, for the construction of any water system improvement or portions of any water system improvement within the Bella Vista Water District.

F. Developer – shall mean any persons, firm, partnership, corporation or combination thereof, financially responsible for the work involved.

G. Development – shall mean the act or process of any construction properties as well as subdivision improvement.

H. Improvements – Refers to water mains and other facilities to be constructed or installed by the developer within an existing or future public right-of-way or easement and other improvements which the Bella Vista Water District is responsible for performing plan check or inspection.

I. Laboratory – shall mean any testing agency or testing firm which has been approved by the Bella Vista Water District.

J. Soils Report – shall mean a report as prepared by any person or persons, firm, partnership, or corporations legally licensed to prepare "Soils Reports" in the State of California.

K. Construction Standards – shall mean the latest edition of the "Standard Specifications for the Construction of Water System Improvements" adopted by the Bella Vista Water District and any amendments thereto governing the construction of water supply facilities within the Bella Vista Water District.

L. Standard Drawings – shall mean the standard drawings included in the latest version of the District's "Standard Specifications for the Construction of Water System Improvements," approved by the District Engineer and as amended.

M. State – as used in State Specifications, shall mean the State of California.

N. State Standard Plans – shall mean the Standard Plans of the State of California, Department of Transportation, latest edition.

O. State Standard Specifications – shall mean the "Standard Specifications" of the State of California, Department of Transportation, latest edition.

SECTION 2

GENERAL REQUIREMENTS

2-1 Plans by an Appropriate Engineer. All plans and specifications for improvements, private and public, which are to be accepted for maintenance by the District shall be prepared by a licensed engineer of the appropriate branch of engineering covering the work submitted.

2-2 Approved Plans. Complete plans and specifications for all proposed streets, grading, drainage facilities, sewerage, traffic signals, water distribution systems, industrial developments, commercial developments, and subdivisions, including any necessary dedications, easements, and rights of entry, shall be submitted to the Bella Vista Water District for approval. This approval shall be substantiated by the signature of the District Engineer prior to the beginning of construction of any such improvements. The District's Inspector shall order any Contractor to cease work on any project of said contractor does not have properly approved plans in possession.

2-3 Reference to District Specifications and Standards. The following note shall be included on all improvement plans:

All construction and materials shall be in accordance with the latest edition of the Bella Vista Water District's Construction Standards and these Design Standards.

2-4 Work In District Right-of-Way and Easements. The following shall govern work done within District right-of-way and easements:

No work shall be performed within the District right-of-way and easements without approved plans and/or encroachment permit issued by the Engineering Department. All necessary bonds and insurances shall be approved prior to the approval of the plans or the issuance of an encroachment permit.

2-5 Submission of Public Improvement Plans. The following are the procedures and requirements when submitting improvement plans for public improvements to the Bella Vista Water District for review. Incomplete submittals will not be accepted.

Improvement plans will be accepted only after the following conditions are met:

A. Development Projects – projects which have been approved by the appropriate City or County Commission may be submitted after the meeting of the Commission which approved the project and after the Conditions of Approval are available from the Planning Department.

B. Subdivisions – rough grading plans and improvement plans, and parcel maps or subdivision maps may be submitted after approval of the tentative map by the approving body and after the Conditions of Approval are available.

C. Submittal Requirements – the following are the submittal requirements of the District:

Engineering Department:

1. Three (3) sets of improvement plans per these Design Standards.

2. An itemized engineer's cost estimate. All cost estimates shall include a ten (10) percent contingency.

3. Payment of plan check fees in accordance with the Bella Vista Water District's established fee schedule.

4. Two (2) copies of the Tentative Map and list of the Conditions of Approval.

5. Two (2) copies of any necessary hydraulic studies.

2.6 Resubmittal Requirements. All resubmittals shall include the previous check prints, comment sheets, or whatever the Department previously returned to the consulting engineer as a result of the plan check. The number of plans required shall be as specified in Section 2.5. All comments shall be either addressed on the plans or, if a comment it not specifically addressed on the plans, a written explanation shall be provided stating why the comment was not addressed on the plans.

Plans being submitted that contain alterations or revisions other than those required by the District shall require the consulting engineer to bring those revisions or alterations to the attention of the District.

2-7 Plan Check and Inspection Fees. When improvement plans are initially submitted to the Bella Vista Water District Engineering Department for checking, an initial plan check is required as a deposit to initiate plans checking (See Section 2-5 C). Prior to approval of the plans, payment of the remaining balance of the fees shall be made.

For subdivisions and certain site development projects where conditioned, the developer shall be responsible or payment of actual costs incurred by the District in providing plan check and inspection services, as determined by the District Engineer. Actual costs will be determined prior to acceptance of the improvements by the District Engineer and additional payment by the developer shall be made if actual costs exceed the deposit, or a refund will be provided by the District if actual costs are less than the deposit. The developer shall notify the District in writing of any change of billing address.

2-8 Plan Approval. No plans will be approved nor construction authorized until such time as the District Engineer signifies his approval by his signature on the set of plans and not unless such changes, corrections or additions are resubmitted to the District Engineer as previously prescribed for the original plans. At such time as the Consulting Engineer preparing the plans has made the necessary revisions and the Owner/Developer has paid the remainder of the total plan check and inspection fee and posted all required bonds and insurances, the District Engineer will sign tracings in the space provided, after the Consulting Engineer has wet stamped, dated, and signed them.

The Consulting Engineer shall deliver to the District two (2) sets of prints from the approved tracings immediately following approval of the plans and prior to construction beginning.

2-9 Expiration of Plans. Every permit issued under the requirements of these Design Standards shall, at the direction of the District Engineer, become null and void if the construction of work authorized by such permit is not commenced within six (6) months from the date of such permit, or if the construction of work authorized by such permit is suspended or abandoned at any time after the work is commenced for a period of six (6) months. At such time, the plans shall be subject to review by District staff to determine conformance with current District standards.

2-10 Improvement Plan Revisions During Construction. Should changes to public improvement plans become necessary during construction, such changes shall be subject to approval by the District.

The procedure for obtaining approval shall be as follows:

A. The Consulting Engineer shall submit the proposed change on "blue-line" sheets shown in red.

B. Following review and approval by the District of the proposed changes, the Consulting Engineer shall submit the current approved plans in reproducible form showing the proposed changes.

C. If determined acceptable, the District will indicate approval for the change by initialing the plans in the revision box.

D. Following return of the reproducible plan to the Consulting Engineer, the Consulting Engineer shall provide two (2) blue-line sheets for each plan sheet affected by the change.

After receiving approval, actual revisions shall be made in accordance with the following:

A. The original design shall not be eradicated from the plans but shall be lined out.

B. In the event that eradicating the original design is necessary to maintain clarity of the plans, approval must first be obtained from the District.

C. The changes shall be clearly shown on the plans with the changes and approval noted on a revision signature block.

D. The changes shall be identified by the revision number in a triangle delineated on the plans adjacent to the change and on the revision signature block.

Minor changes during construction which do not affect the basic design of the improvements may be made upon authorization of the District without formally revising the plans. These changes shall appear in the record drawings.

The District Engineer may order changes in the plans in order to complete the necessary facilities or to conform to these Design Standards, the Standard Construction Specifications, and the Standard Drawings or accepted engineering standards. The procedure for making changes in the plans ordered by the District Engineer shall conform to the above outlined procedure and standards.

2-11 Record (As-Built) Plans. The contractor/developer shall keep an accurate record of all approved deviations from the plans and shall provide a mylar copy of the as-built plans prior to final acceptance of the completed improvements. Each sheet of the plan shall be marked "AS-BUILT" or 'RECORD DRAWING." "As-Built" or "Record Drawing" of water, parcel, and final maps shall also be submitted on computer disk in DWG or SHP/SHX format.

2-12 Conflicts, Errors, and Omissions. Excepted from approval are any feature of the plans that are contrary to, in conflict with, or do not conform to these Design Standards, the Standard Construction Specifications, any California State law, ordinance or resolution, conditions of approval, or generally accepted good engineering practice, in keeping with the standards of the profession, even though such errors, omissions or conflicts may have been overlooked in the District's review of the plans. The responsibility of accurate plans which provide for safe and proper design rests with the Consulting Engineer, not the District.

2-13 Change in Consulting Engineer. If the Developer elects to have a Registered Civil Engineer or Licensed Surveyor other than the engineer who prepared the plans provides the construction staking, the Developer shall provide the District in writing the name of the individual or firm one week prior to the staking of the project for construction. The Developer shall then be responsible for proving all construction, the preparation of revised plans for construction changes, and the preparation of "as-built" plans upon completion of the construction.

In the Developer's notification of a change in the firm providing construction staking, the Developer shall acknowledge that he/she accepts responsibility for design changes and "as-built" information as noted above.

2-14 Other Agency Notification. The Owner/Developer is responsible for obtaining required approvals and permits from all other governmental agencies, as required, prior to issuance of any District permits.

2-15 Inspection Requirements. Any improvement constructed in conformance with these Design Standards and the Standard Construction Specifications for which the District is intended to assume maintenance responsibility, shall be inspected during construction by the District Engineer or his designee. Each phase of construction shall be inspected and approved prior to proceeding to subsequent phases. Requests for inspections shall be given 24 hours in advance.

Any improvement constructed without inspection as provided above or constructed contrary to the order or instructions of the District Engineer will be deemed as not complying with the District's Construction Standards and will not be accepted by the District for maintenance purposes.

2-16 Final Inspection. Upon completion of any improvements which are constructed in conformance with these Design Standards and the Standard Construction Specifications and prior to requesting final inspection, the area shall be thoroughly cleaned of all rubbish, excess material and equipment, and all portions of the work shall be left in a neat and orderly condition satisfactory to the District Engineer.

Within 10 working days after receiving the request for final inspection, the District Engineer shall inspect the work. The Contractor will be notified in writing as to any particular defects or deficiencies to be remedied. The Contractor shall proceed to correct any such defects of deficiencies at the earliest possible date. At such time as the work has been completed, a second inspection shall be made by the District Engineer to determine if the previously mentioned defects have been repaired, altered, and completed in accordance with the Standard Construction Specifications. At such time as the District Engineer approves the work, a recommendation will be made to the District for final acceptance.

On assessment districts and projects where the District participates in the costs thereof, quantities will be measured in the presence of the District Engineer, Consulting Engineer, and Contractor and witnessed accordingly.

2-17 Overtime Inspection Services. Any inspection service performed beyond normal working hours, or on weekends or holidays, either at the request of the contract or/developer or at the discretion of the District Engineer, shall constitute overtime inspection work. Payment of fees in addition to the normal plan checking and inspection fees shall be made for these services. The amount of the additional fees shall conform to the fee schedule for plan checking and inspection fees as adopted by the District. If the overtime services are provided at the request of the contractor/developer, requests and payment shall be made at least 48 hours in advance unless an initial deposit for plan checking and inspection fees has been paid. Granting of the request to provide overtime inspection shall be at the sole discretion of the District Engineer and may be subject to the availability of inspection personnel.

2-18 Acceptance of Improvements. No improvements will be accepted by the District until all improvements required of the subdivision or development project have been completed and approved by the District Engineer. A formal offer of dedication will be required before the improvements can be accepted by the District. A copy of the District's Capital Conveyance Agreement can be obtained from the District's website. Once all of the terms of the Capital Conveyance Agreement are met formal acceptance of the improvements will be presented to the District's Board of Directors for acceptance. Following Board acceptance formal notification of acceptance will be signified by notification, in writing, from the District Engineer.

2-19 Special Notices and Permits. The Consulting Engineer shall be responsible for advising the Contractor to give the following notices and have in his possession the following permits and plans:

A. Contractor shall be in receipt of official District approved plans prior to construction.

B. Contractor shall notify the District and all utility companies involved in the development at least 48 hours prior to beginning of work.

C. Contractor shall notify “Underground Service Alert” and have construction area marked at least two working days prior to any digging.

D. Contractor shall be responsible for the protection of all existing monuments and/or other survey monuments.

E. Contractor shall be responsible for conducting his operation entirely outside of any prohibited area. These areas shall be clearly delineated in the field prior to construction.

SECTION 3

PLAN SHEET REQUIREMENTS

3-1 General. Public improvement plans shall be prepared for public improvements required of subdivisions and all other work performed within the District rights-of-way or assessments. The following requirements apply to the form of public improvement plans.

3-2 Plan and Profile Sheets. All improvement plans shall be clearly and legibly drawn in ink or engineering mylar, or approved equal, 24 inches by 36 inches in dimension ("D" size). Sheets shall have a 1-1/2 inch wide clear margin at the left edge and a 1-inch wide margin on all other edges, or as otherwise approved by the District Engineer.

A. Drafting Standards – all line work shall be neat, clearly legible, and opaque to light. Letters and numerals shall have a minimum height of 1/8 inch and be well formed and sharp. Numerals showing profile elevations shall not be bisected by station grid lines. Dimension lines shall be terminated by sharp, solid arrowheads.

B. Scale – horizontal scale shall be 1-inch = 20, 40, or 50 feet. Vertical scale shall be 1-inch = 2, 4, or 5 feet.

C. Title Block – a title block must be shown on each sheet within the set of drawings and shall show the subdivision or project name, sheet title, sheet number, date, scale, and the Consulting Engineer's name, signature and license number.

3-3 Title or General Information Sheet. Each set of improvement plans shall have a Title or General Information Sheet. This sheet shall be sheet one of the plans and shall include the following:

A.(*) A vicinity map drawn to a convenient scale, preferably not less than 1-inch = 2000 feet. The north arrow must point to the top of the sheet.

B.(*) A north arrow and scale.

C.(*) Index of sheets.

D.(*) A signature block for the District Engineer and Facilities Engineer.

E.(*) Utility information block.

F. The entire subdivision or parcel drawn to a scale not less than 1-inch = 200 feet, or as approved by the District Engineer. This map shall provide the following:

G. Streets and street names of all streets within or contiguous to the project.

H. Adjacent subdivisions or parcels properly identified including names, lot lines and lot numbers.

I. All property lines.

J. Legend of symbols conforming to the Standard Drawings.

K. All of the District General Notes, shown verbatim.

Improvement plans consisting of fewer than four sheets, except traffic signal plans, shall not include a Title Sheet, but instead shall show all of the above information on the plans. If a title sheet is not required, those items marked with an (*) shall be shown on the first sheet.

3-4 Street Plan and Profile Sheets. The following requirements are for all plans submitted to the District for review and approval.

A. Plan View – the plan view of each sheet to be improved shall be shown on separate sheets and shall include existing improvements and contours/elevations within 100 feet of the project boundary, any easements required (refer to Section 4-10 for easement requirements), the proposed water system improvements and future improvements, if known.

B. Profile View. The profile view of each street shall be shown immediately below its plan view. The profile shall include existing and proposed street centerlines, sewer mains, storm drawings, water mains, and all utility crossings. District elevations shall be shown on the street centerline, stations, and grade break points.

3-5 Detail Sheets. Detail sheets, if necessary, shall delineate special details, structural designs, etc. for which no Standard Drawings exists, and when space is not available on the plan and profile sheets.

Plan views of the structure for which details of design are to be provided shall be shown on the detail sheet depicting the location of said structure in relation to street centerlines, stations, bearings, skews, grades, etc. Structural details shall be delineated at a scale that will clearly define all facets of the design.

District standard drawings shall not be delineated on detail sheets of any other sheet unless reproduced in full.

3-6 Property of District. All plans, maps, reports and any other items submitted to the District shall become the property of the District. The District shall not be responsible for the return of these items once they are submitted.

SECTION 4

DOMESTIC WATER SUPPLY SYSTEM

4-1 Introduction. These Design Standards shall govern the engineering design of all domestic water systems intended for operation and maintenance by the District.

4-2 Intent of Criteria. The intent of these criteria is to provide a water system that will dependably and safely convey the required amount of high quality water throughout the distribution system with the least cost. In establishing the required amount of water, periods of peak domestic demand occurring in conjunction with an emergency fire flow demand shall be considered.

4-3 Current Standards. Pertinent and current requirements of the following agencies or standards shall be complied with. In case of conflict the design criteria of the District, as established herein, shall govern.

A. Environmental Protection Agency Drinking Water Regulations.

B. Laws and Standards of the State of California, Division of Drinking Water relating to Domestic Water Supply.

C. The Construction Standards of the Bella Vista Water District.

D. State Water Resources Control Board Cross-Connection Control Policy Handbook. as defined in California's Health and Safety Code (CHSC).

E. Uniform Fire Code

F. Uniform Plumbing Code

G. Latest edition of American Water Works Association (AWWA) Standards.

4-4 Water Supply Quality. The quality of the water shall conform to the Environmental Protection Agency Drinking Water Act and the State Division of Drinking Water Standards.

4-5 System Demand Criteria for Developments. The District reserves the right to determine criteria for each water system or sub-system based upon conditions that may exist for that particular location, anticipated level of development, planned use, or other criteria. In general, however, water pipelines, tanks, pump stations, pressure reducing stations and appurtenances shall be sized to handle the highest demand on the system within the area of influence and shall provide capacity for the following conditions:

A. The peak-hour demand
B. The maximum-daily-demand plus fire flow
C. Tank refill, if required

The Developer's engineer will be required to submit an analysis of anticipated flow demands, average, maximum-hour flow, and maximum-day plus fire flow. The District may accept or request modifications to the submitted analysis.

4-6 Water Supply Pressure. Normal operating pressures of not less than 40 psi not more than 100 psi shall be maintained at service connections to the distribution system, except that during periods of peak domestic and fire demand, the pressure shall not be less than 20 psi and the maximum velocity in the pipelines shall not exceed 7.5 feet per second

4-7 Rate of Domestic Use. For design of the distribution system, a peak domestic demand rate of 15 gallons per minute per gross acre or 400 gallons per day per capita, whichever is greater, shall be assumed. For extension of existing systems consisting of more than 500 services, the design shall be based on records of the average rate of consumption per service on the day of maximum use. Special consideration shall be given to areas zoned for multiple housing, schools, commercial or industrial development. Storage reservoirs shall be considered in meeting these requirements.

4-8 Required Fire Flows. The required fire flows shall be in accordance with the requirements of the fire protection agency having jurisdictional authority. Developer's engineer should obtain hydrant flow, location and spacing information from the governing fire protection agency.

4-9 Location in Existing Streets. Where water mains or services are to be located in an existing street, factors such as curbs, gutters, sidewalks, traffic conditions, traffic lane conditions, pavement conditions, future street improvement plans, and existing utilities shall all be considered. The approval of the District Engineer shall be obtained in every instance.

4-10 Transmission System Design. Sizing and layout of transmission mains shall conform to the Master Plan of the Bella Vista Water District. Technical specifications for water transmission mains shall be a requirement of the proposed improvement plans. Under no circumstances shall fire hydrants or water services be directly connected to a transmission main, with the exception of hydrants that are acting as blow offs.

A. Transmission Main Location – all transmission mains shall be installed within public rights-of-way and easements.

1. Mains shall be located three (3) feet from the curb and gutter. If conflicts exist at this location, then the main may be installed within an easement immediately adjacent to and behind the property line fronting the public right-of-way, subject to approval of the District Engineer.

2. A minimum horizontal separation of ten (10) feet shall be maintained between the outside of all water mains and sanitary sewer mains.

3. A minimum cover of 36" shall be maintained at all locations.

4. Transmission mains shall maintain a minimum vertical clearance of one (1) foot from all other utilities.

4-11 Distribution System. Sizes of mains shall be such that the stated normal pressures, as specified in Section 4-5, and the minimum requirements for main spacing specified below, are maintained.

The Hazen-Williams formula shall be used in the hydraulic study of the system, using a "C" value of 120 for cement-mortar-lined and ductile iron pipe, and 130 for polyvinyl chloride pipe (PVC) pipe.

A Hardy-Cross hydraulic analysis of any proposed distribution system shall be supplied to the District upon request. In design of the system, the maximum delivery from any hydrant of a type conforming to the current District Standards shall be assumed to be limited to 1,500 gallons per minute.

The distribution system shall provide a minimum of 40-psi pressure at the meter to each and every customer service within the development using the pad elevation of the water tank, at half-full, serving the area as the starting hydraulic grade line or for pumped zones the normal discharge setpoint for that pressure zone. Fire hydrants are to have 20-psi minimum residual pressure at design capacities.

If any service at the meter is proposed to be less than 50 psi Engineer shall submit calculations demonstrating actual pressure at all fixtures being supplied by that meter. Services less than 40 psi at meter will require a low-pressure service agreement.

Commercial and industrial developments are to be analyzed by Developer's Engineer for review by the District's staff. District staff may accept or modify the proposed pipe sizing.

District staff reserves the right to specify sizing of any water pipeline. Due to master planning, District staff may require a larger size pipeline than normally required for a particular project to satisfy the District's design standards for system distribution requirement purposes. The District's Board of Directors may authorize participation and payment of increased cost of such water pipeline in accordance with District criteria.

A. Location of Mains – all water mains shall be installed within public rights-of-way or easements. In every instance where a water main is to be installed in public rights-of-way or easements, the District Engineer shall be contacted for the preferred location.

1. Mains shall be located three (3) feet from the curb and gutter. If conflicts exist at this location, then the mains may be installed within an easement immediately adjacent to and behind the property line fronting on the public right-of-way, subject to the approval of the District Engineer.

2. If it is necessary to install a water main outside of the public right-of –way, an easement dedication to the District shall be required. Easements

for water lines shall meet all of the following width criteria:

a. Minimum width of easement shall be 20 feet.

b. All easements shall have a minimum width equal to the required trench width according to the standard detail for trench backfill plus two (2) additional feet of width for every foot of depth of the pipe, as measured from the bottom of the pipe to finished grade.

c. Easement width shall be width of pavement plus one (1) foot.

3. The minimum horizontal distance between parallel water and sanitary sewer lines shall be ten (10) feet, and the water main shall be higher than the sewer. On crossings, the water line shall be at least 12" above the sewer line. In cases where the water main must cross under the sewer main or service, and with permission of the District Engineer, the water line shall be ductile iron five (5) feet either side of the crossing and be concrete encased.

4. When crossing a sanitary sewer force main, the water main shall be installed a minimum of three (3) feet above the sewer line and be of ductile iron a minimum of five (5) feet on each side of the force main.

5. No parallel utilities shall be placed within five (5) feet of either side of a water main.

6. All water mains not under pavement must be ductile iron and follow District construction standards.

B. Sizes of Mains and System Layout – the distribution system, whenever possible, shall be in grid form so that pressures throughout the system tend to become equalized under varying rates and locations of maximum demand. The minimum pressures and flows, as specified in these Design Standards, shall govern design of the system. The following conditions are to be considered for the distribution system design:

1. The minimum pipe size shall be eight (8) inches in diameter.

2. For maximum hourly flow; pipelines are to be sized to provide headlosses not to exceed 3.5 feet (1.5 psi) per 1000 feet of water pipeline.

3. For maximum daily flow plus fire flow; pipelines are to be sized to provide headlosses not to exceed 5 feet (2.2 psi) per 1000 feet of water pipeline.

4. Under all operating conditions, mainline velocities are not to exceed 7.5 feet per second.

5. Where water mains are installed in arterials, dual mains (one pipeline on each side of the street) may be required by the District Engineer. The minimum size of each

pipe shall be eight (8) inches in diameter on each side in residential areas. The size shall be designed for the fire demand requirements. Standard pipe sizes are 8", 10", 12", 16", 24", 30", 36", 42", 48", and 54".

6. The distribution system shall be grided with 12-inch or larger cross-connecting mains at intervals of approximately 1,300 feet with intermediate eight (8) inch or larger lines, as required.

7. Larger mains shall be provided at one (1) mile intervals or to serve multiple housing, commercial, or industrial areas as determined by an engineering evaluation of the anticipated demand.

8. All projects will be required to extend water pipeline facilities across the full extent of the project parcel(s).

9. Mains shall maintain a minimum cover of 36" and a maximum depth of 60"as measured from gutter flow-line, unless otherwise approved by the District.

10. Water pipeline installation near sewer lines, recycled water lines, or storm drains shall be in accordance with the California Waterworks Standards and State Water Resources Control Board, Division of Drinking Water (DDW) guidelines. These can be obtained from the DDW. The District may specify more stringent criteria where deemed necessary.

11. Mains shall maintain a vertical clearance of one (1) foot from all other utilities (outside of pipe to outside of pipe).

C. Valves, Hydrants, and Blow-Offs – the distribution system shall be equipped with a sufficient number of valves so that no single shutdown will result in shutting down a transmission main. Valves shall also be spaced no greater than 500 feet in school, commercial, industrial, or multiple-family dwelling areas. In other residential areas, valves shall be spaced such that no single shutdown will result in shutting down more than 20 services or 800 feet of main, whichever occurs first. In no case shall more than two (2) fire hydrants be removed from service. Valves shall be located such that any section of main can be shutdown without going to more than three locations to close valves. All tees shall have at least two (2) valves and all crosses shall have at least three (3) valves. Valve stems shall be set at a depth not to exceed 40-inches. A valve shall be installed on services greater than four (4) inches in diameter immediately off the main.

Fire hydrants and blow-off assemblies shall be located as follows:

Fire hydrants, conforming to the Standard Drawings, shall be placed at street intersections whenever possible, and located to minimize the hazard of damage by traffic. They shall have a maximum spacing of 500 feet measured along the street frontage in all areas. Hydrants located at intersections shall be installed at the curb return. All others shall be located on property lines between lots, two (2) feet back of the sidewalk. Hydrant valves shall not be placed within 15-feet of hydrants. Each hydrant shall be marked with a blue reflective pavement marker placed one

foot off of street centerline.

1. Not more than two (2) hydrants shall be placed on a six-inch main between intersecting lines and not more than three (3) hydrants on an 8-inch main between intersecting lines. The pipeline connecting the hydrant and the main shall be a minimum of six (6) inches, with a gate valve flange connected to the main.

2. A blow-off assembly, conforming to the Standard Drawings, shall be installed on all permanent and temporary dead end runs. Whenever possible, the blow-off shall be installed in the street right-of-way a minimum of five (5) feet from the curb and gutter. In no case shall the location be such that there is a possibility of back- siphonage into the distribution system.

3. Air Valves and Sample Stations may be required when applicable.

D. Service Lines – service lines from the water main to the property line or edge of easement shall normally be installed at the time the main is constructed. Services from mains installed in private roads shall extend one (1) foot beyond the edge of the pavement. Service line criteria shall be as follows:

1. In all new subdivisions, the service line conforming to the Standard Drawings shall be located 42-inches from the side property line. The curb shall be stamped with a "W" at all service locations. If it is preferred to have the service located other than that specified, it shall be brought in no closer than nine (9) inches to a side property line.

2. The standard size of a single-family residential service line shall be 2-inch in diameter. Schools, commercial, industrial, or multiple-family units with higher demand shall be provided with larger service lines, subject to approval by the District Engineer. Service lines in sizes up to 2-inches in diameter shall be polyethylene bedded in sand. Materials for lines larger than 2-inches shall be subject to approval by the District. All services shall be installed with a corporation stop at the main and an angle meter stop before the meter. Services shall be one piece continuous with no couplings from corp stop to curb stop. A resilient seat gate valve shall be used only when the service is larger than 2-inches.

3. Service taps on non-metallic water pipe (C-900 PVC, etc.) shall be brass (Mueller H-13400, Jones J-996, Ford 911) and services to the property line (curb stop) shall be polyethylene. Any deviation from these materials must be reviewed and approved by the District in writing.

4. The District shall make all water service taps into existing mains upon application for a permit and payment of the required fees. A note to this effect shall be placed on the plan sheet which details the area that requires such tapping. Application shall be made to the District and the required fees paid at least two weeks in advance of the time the tap is desired. All excavation and backfill and the installation of the remainder of the water service shall be done by the Contractor.

(Note: the above applies only when the service is constructed as a part of an improvement contract. For rules regarding the installation of an individual water service, contact the District office.)

E. Water Meters – water meters shall be appropriately sized and installed on all services. District forces shall install all meters after all fees and permits are processed.

F. Main Line Pipe, Fittings, and Connections – mains 12-inches in diameter and smaller shall be American Water Works Association C900 Class 150. Pipe diameters larger than 12-inches shall be AWWA C905 or ductile iron with interior mortar coating in accordance with AWWA standards. All mains shall have a 12-inch wide, blue, plastic non-metallic backfill tape marked "BURIED WATER MAIN BELOW" placed in the trench within 12 to 24 inches of the surface. Mains in unpaved areas shall be marked every 150-feet minimum with a blue 5'-6" composite utility marker. This marker will have a decal stating "CAUTION WATER PIPELINE." Marker shall be Carsonite composite products or equal with anchor barb kit. All ductile iron pipe, valves, fittings, underground brass, and all service saddles shall be wrapped with 8 mil or thicker polyethylene and sealed. All poly wrapped pipe shall be backfilled with sand. Large valves and fittings shall be mortar-coated.

Main line fittings shall be mortar lined ductile iron only. All fittings shall be of mechanical joint or flanged. No push on fittings will be allowed. The beveled end of all pipe will be cut off before being placed in a mechanical joint. All fittings shall maintain a minimum of 18-feet of restrained pipe into the fitting in all directions. Thrust blocks shall be used where approved by the District Engineer. PVC pipe may be restrained with PVC Romac Grip Ring only. If straight runs of PVC are to be restrained, Teed Carrta-Lock shall be used. All restrained systems shall be shown in plan and profile and on the master water plan. "Sap seal" caps shall be placed on all nuts and bolts. Ductile iron pipe shall use standard boltless connections either TR Flex, Mega Lug, or US Pipe Filed Lock Gasket. Design of restrained systems shall follow standard engineering practices. The District Engineer shall approve the design. An acceptable method of design is "Thrust Restraint Design Program" by EBAA iron. Any deviation from these requirements will not be permitted without approval from the District Engineer.

G. Tracing Wire. 12-gauge, insulated tracing wire shall be applied to mains and service lines. Wire shall be continuous between main line valve boxes and fire hydrants. Tracing wire through valve boxes shall be placed outside of the riser but inside the box.

H. Valves – gate valves shall be used in 12-inch and smaller lines. Butterfly valves will be used on 14-inch and larger lines. Gate valves shall be U.S. Pipe Metro Seal, Mueller Valve, or American Darling only. All gate valves operating nuts shall be centered in a one-piece PVC riser stock, 6-inch minimum diameter, with the use of a SDR 35 minimum or better riser or equal. Operator nut shall be within 40-inches of the surface. Boxes shall be G-5 traffic rated. Butterfly valves shall be Harry Pratt Ground Hog or approved equal.

All valve boxes in the street and other traffic areas shall be of an H-20 locating capacity, Christy Type G5, Type B17 by 30 H-20, or approved equal. All butterfly valves shall be

placed in a vault.

I. Detector-Check Valves – a detector-check valve and bypass meter is required on each fire service line into a building.

J. Backflow Devices – backflow devices are required in accordance with the District's Policy Manual (Article XI) and the Cross-Connection Control Policy Handbook. All devices must be approved by the District.

The District maintains a list of acceptable devices which is updated annually. It is the Consulting Engineer's responsibility to ensure that the proposed backflow device is currently acceptable.

Design Standards
Appendix A

Revision History

Adopted ..... March 26, 2007

Revised ..... March 24, 2016

Revised ..... July 22, 2024