



City of Rohnert Park

# Water Design Standards



**WATER DESIGN STANDARDS  
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**Volume 1**

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## **WATER DESIGN STANDARDS**

### **I. PURPOSE**

To provide guidelines for the design of water utilities projects and thereby reduce the time required for processing the plans. These guidelines do not include, but may reference, additional conditions which may be promulgated by all other pertinent ordinances, codes, and official policy set forth by the Utilities Department or other departments of the City of Rohnert Park or other government agencies. These guidelines establish minimum acceptable design criteria. More stringent requirements may be imposed by the City Engineer based on specific project conditions.

Portions of these standards apply to fire systems, both public and private, and are intended as general reference to aid in the design of the public water system. Final designs are subject to approval of the Fire Department.

It is the responsibility of the design engineer to initiate written requests to the City Engineer for approval of any design concepts that differ from these criteria, verify additional requirements imposed, perform any necessary calculations or studies, and resolve specific design problems with the appropriate agency, department or division.

### **II. REQUIREMENTS FOR IMPROVEMENT PLANS AND SUBDIVISION MAPS**

- A. Provide a detailed utility plan showing onsite and offsite public and private water and fire protection systems, including mains, services, hydrants, and all other required appurtenances, and their connections to existing City-maintained water facilities. Show the location, type, and diameter of public and private water mains. Reference any existing fire hydrants within 300 feet of the project boundary. Show any wells existing or to be abandoned. When a separate irrigation service is necessary, an irrigation plan is required per Section X. N. of these standards. (See Section XI for submittal of plans for private fire systems.)
  
- B. Annotate the local agency information sheet of the Subdivision Map with any information that is needed to notify property owners of requirements for connection to the City water system. These include, but are not limited to:
  - 1. payment of fees prior to issuance of Building Permits,
  - 2. lots requiring pressure regulating valves or booster pumps,
  - 3. backflow protection,
  - 4. public water access requirements, such as gates or access roads.The appropriate information may be obtained from Public Works and Engineering.
  
- C. Miscellaneous specific items required on improvement plans are indicated throughout these Standards.

- D. Before combustible materials may be delivered, stored or constructed on site, fire flow and access must be provided and approved by the Fire Department per current City Fire Code. In addition, public and/or private fire hydrants must be installed, flushed, tested, and operational. This information must be included on all improvement plans. Provide any necessary calculations with the submittal of improvement plans or with the Tentative Map submittal to demonstrate adequate fire flows are available.

### **III. WATER MAINS - GENERAL**

- A. Public water mains may not be designed outside the street right-of-way without City Engineer approval.
- B. In general, publicly maintained water systems will be designed only where they serve multiple ownership lots and where appropriate access for maintenance can be provided.
- C. Water mains installed at a slope of 15% or greater will be designed with restrained joints. The Design Engineer must provide adequate drainage measures to protect the trench from erosion.
- D. Water mains installed outside of any roadway, called “cross-country mains,” must be Ductile Iron Pipe and will have suitable access. In general, cross-country mains must be isolated with valves in the public right-of-way and must be identified with blue locating posts (Carsonite 492 CW-112 or approved equal) at approximate 500-foot intervals, at any angle point, and at the entrance to an easement. Identifying posts should have vandal-proof metal bottoms. Access requirements as established in Section XIV of the Sewer System Design Standards may be imposed on a project based on site conditions.
- E. For system reliability, to minimize pipe size, and to minimize the number of people affected by a system shutdown, either for domestic or fire protection purposes, no more than 100 residential units may be served by a single-feed water system, providing it is hydraulically adequate. Where more than 100 units are to be served, a dual-feed (or “looping”) public water system must be designed to provide a secondary source of water to the project. Onsite private fire requirements, such as dual fire services and looping mains, will be determined by the Fire Department for residential and nonresidential developments.
- F. For purposes of leak detection and maintenance access, no reinforced concrete may be designed over publicly maintained water facilities. Unreinforced concrete will be allowed under special circumstances such as crosswalks.

- G. Extent of water main improvements will be as follows:
  - 1. Any offsite water main improvements needed to serve the project must be shown on the improvement plans, including upgrades to existing mains that may be required as a result of a flow analysis or modeling effort.
  - 2. In general, water mains must be designed to cross the full property frontage or to the limits of the street improvements, whichever is greater.
- H. Streets with both water and sewer mains must be at least 20 feet wide, face-of-curb to face-of-curb. Streets with only a water or sewer main must be at least 20 feet wide.

#### **IV. MATERIALS**

- A. Service laterals will be polyvinyl chloride (PVC), Polyethylene (PE), or Ductile Iron Pipe (DIP) per applicable City Standards.
- B. 8-inch to 12-inch public water mains and 6-inch to 12-inch private fire mains will be Polyvinyl Chloride (PVC) Pressure Class 150, DR18 per AWWA Standard C900, minimum or Ductile Iron Pipe Pressure Class 350 per AWWA Standard C151 minimum. Where the normal mainline static pressure exceeds 100 psi, Ductile Iron Pipe or PVC Pressure Class 200, DR14 must be used.
- C. 16-inch diameter water mains will be Ductile Iron Pipe per AWWA Standard C151, or as shown on plans and specifications. Where the normal mainline static pressure exceeds 100 psi, AWWA Standard C905, DR18 with a pressure rating of 235 psi or Ductile Iron Pipe must be used.
- D. 20-inch diameter and larger water mains will be wrapped AWWA C200 welded steel pipe.
- E. Asbestos cement pipe will not be allowed under any circumstances.

#### **V. CONNECTION TO AN EXISTING PUBLIC WATER MAIN**

- A. Indicate a “hot tap” for connection of service laterals 4-inch in diameter and smaller.
- B. Indicate connection of pipes 6-inch to 12-inch in diameter with a hot tap or a cut-in tee in conformance with the provisions of the Water System Construction Standard Specifications Section 99-1.20. Hot taps will be allowed only when no main line valves are required.
- C. Design a cut-in tee if additional valves are required on the existing main. If the new main/lateral is larger than the existing main, the tee and main/lateral valve will be the size of the existing main unless it is hydraulically necessary to increase

the tee and valve to the size of the new main/lateral. Cut-in tee should not be closer than 2 feet from a joint on existing pipelines.

- D. Tie-ins to the existing City water system must be inspected by a Public Works Inspector and the improvement plans must be so annotated.
- E. Size-on-size taps are not allowed, except with specific approval of the City Engineer. Hot taps shall be two nominal sizes smaller than the main.
- F. In most major streets, or where the street surface is less than five years old, installation methods other than open cutting may be required. The City Engineer as appropriate will determine the requirements based on the condition of the existing street.

## VI. ALIGNMENT

- A. Horizontal
  1. Alignment will be in accordance with the provisions of Standard 871.
  2. The minimum allowable radius of curvature for an 8-inch water main is 250 feet and for a 12-inch water main is 350 feet (or manufacturer's recommended minimum radius, whichever is greater). In situations such as streets that have smaller radius curves, the water system will be designed in straight segments parallel to the sewer or storm drain system so that future locating is simplified.
  3. Conform to the California Department of Public Health Drinking Water-Related Regulations found in the California Code of Regulations, Title 17 and Title 22.  
<http://www.cdph.ca.gov/certlic/drinkingwater/Pages/Lawbook.aspx> for the Separation of Water Mains and Non-Potable Pipelines, **§64572. Water Main Separation.**
  4. The minimum horizontal separation between water mains and storm drains monuments, gas, electrical, and telephone lines is 4 feet clear except at crossings.
  5. The minimum clear horizontal separation from a metallic pipeline with an induced current or from an anode field will be 5 feet. Where the new water main will be in proximity to an anode field, special design will be required for approval by the City Engineer.
  6. All public water mains must be designed a minimum 5 feet from all structures, such as manholes or drop inlets. Provide a minimum of 3 feet from the lip of gutter for service connections and repairs. Water mains will be designed a minimum of 5 feet from the edge of easements.
  7. All water main trenches that are parallel to and deeper than the footing of any adjacent structure must be designed at least forty-five (45) degrees from the footing as required in the Uniform Plumbing Code. Any exceptions must be approved in writing by the City Engineer. (See City Std. 517)



8. Where dual water mains are designed, a minimum 5 feet clear horizontal separation will be maintained.
  9. In general, water main crossings over or under other underground facilities will be designed as close as 90° to that facility as possible. Crossings of less than 45° are not allowed.
- B. Vertical
1. Conform to the California Department of Public Health Drinking Water-Related Regulations found in the California Code of Regulations, Title 17 and Title 22.  
<http://www.cdph.ca.gov/certlic/drinkingwater/Pages/Lawbook.aspx> for the Separation of Water Mains and Non-Potable Pipelines, §64572. **Water Main Separation.**
  2. Where dual water mains are designed, a minimum 1-foot clear vertical separation will be maintained.

## VII. MAIN SIZING CRITERIA

- A. A hydraulic analysis is required for all water system design projects. The hydraulic analysis shall be used to verify flow demands and pressure availability for the proposed project. The analysis shall also demonstrate the effect the proposed project will have on the existing distribution system. The hydraulic analysis shall include, as a minimum, the following:
1. Under peak hour demands (excluding fire demands), the water distribution system shall maintain pressures above 40 psi.
  2. Under peak hour demand plus fire demands, the water system shall maintain pressures above 20 psi. Hydrant flow test data (static pressure, residual pressure and flow) used for design shall be reduced by 10 percent.
  3. Looping of water lines shall be used in design to avoid dead-end water lines.
  4. Velocity in any pipe line shall not exceed 10 fps under any condition.
  5. Head losses in any pipe line shall not exceed 20 psi per 1,000 feet of pipe line.
  6. Provide a separate hydraulic analysis for each phase of the project to confirm adequate system design.
- B. Allowable nominal sizes for public water mains are 8-inch, 12-inch, and 16-inch. Mains larger than 16-inch must have specific approval of the City Engineer.
- C. Public water mains must be sized to meet minimum Fire Code requirements in addition to domestic and irrigation demands. Private fire protection mains must be sized to meet minimum Fire Code requirements (see Section XII for fire flow requirements).
- D. The minimum new public main size is 8 inches. New public mains serving commercial, industrial and/or multi-family residential developments greater than

two units must be a minimum of 12 inches. Existing mains that will serve such proposed uses must be upgraded as needed to meet the current Fire Code.

- E. Analysis and design of water systems will be based upon the criteria listed in the City's Water System Master Plan where applicable. The City Engineer may require increased pipe size for overall system benefit. When the project is required to provide larger water mains than needed for the development, the applicant may apply to the City for oversize reimbursement.

**VIII. MAIN/LATERAL COVER**

- A. Cover is the distance from the top of the pipe to final finished grade measured directly over the pipe.
- B. Typically, the minimum standard depths of cover for public water mains and private fire protection mains are:

<b>Pipe Size</b>	<b>6-inch</b>	<b>8-inch</b>	<b>12-inch</b>	<b>16-inch or Larger</b>
Cover (in.)	36-inch	36-inch	44-inch	48-inch

- C. Where minimum cover is less than standard or greater than 8 feet, special permission from the City Engineer is required. Show mains with nonstandard cover in a profile on the Improvement Plans or Encroachment Permit applications. Where cover is less than the standard, Pressure Class 350 Ductile Iron Pipe is required. (A two-sack sand slurry mix or Control Density Fill (CDF) shall be used in paved sections where trenching within existing streets is being performed.)
- D. Under no condition will cover be less than 24 inches.
- E. The minimum cover for service laterals will be as shown on the appropriate City Standard Plan. Where service laterals have conflicts with other facilities, a detail or profile must be shown on the plans, or the plans must be sufficiently annotated to give clear direction for the installation.
- F. When designing a cut-in tee for a service or main connection that is larger than the existing main, the new assembly must be shown at a depth sufficient to allow the valves to remain below the street subgrade, which may necessitate lowering the existing main.

## **IX. VALVING**

- A. Valving at intersections will be in accordance with the provisions of Standard 871. A minimum of three (3) mainline valves are required for “T” intersections and four (4) valves are required for cross intersections.
- B. All hydrants must be on separately valved sections of the public main, including fire lines serving private hydrants.
- C. Any water main which does not have a fire hydrant or lateral connection will have valves designed at approximately 1,000 foot intervals or as required by the City Engineer. Valves shall be spaced so that not more than two fire hydrants are out of service at one time.
- D. Water main valves must be designed outside of concrete areas wherever possible to facilitate repairs.

## **X. SERVICE LATERALS AND METERS FOR DOMESTIC AND IRRIGATION SERVICE**

- A. Developments shall be provided City domestic and/or irrigation water service via water meters located at the frontage of a public street.
- B. Design meter boxes out of traveled ways and a minimum of 10 feet from street trees whenever possible. On narrow lots, the minimum separation between meter boxes and street trees shall be 6 feet.
- C. Base any required hydraulic calculations for the water meter and service lateral sizes on criteria from AWWA Manual M22 and submit to the City Engineer for approval.
- D. The maximum velocity in domestic, irrigation, fire line, or combination water service laterals from the main to the meter is 15 feet per second.
- E. Maintain a minimum 5 feet horizontal separation between water and sewer laterals.
- F. Meter manifolds other than those shown in various City Detail Drawings will be detailed on the plans and approved by the City Engineer.
- G. Residential (single units).
  - 1. Each lot must be separately metered.
  - 2. A standard 1-1/2-inch dual water service lateral is preferred when practical to serve two single-family residential lots, providing each lot is less than 1/2 acre. Otherwise, provide an individual 1-inch service lateral for a 1-inch meter for each lot.

3. Each lot with fire service to be served by a 1-inch minimum or 1-1/2-inch service per Std. 863A.
- H. Residential with second unit (as defined in the City Zoning Code Section 17.04.030 Second Dwelling or Residential Unit), two SFDs on one lot, and Duplexes.
1. Each unit must be served by separate meters.
  2. If a new second unit is constructed and the total water flow for both units exceeds the capacity and allowable velocity of an existing service lateral, based on the criteria established in AWWA Manual M22, the service lateral must be upsized. Otherwise, the existing lateral may be utilized.
  3. If the primary unit and the second unit are to be constructed at the same time, design a 1-inch minimum service lateral for the site.
  4. The appropriate service lateral must be shown on the Public Improvement Plans and/or Encroachment Permit submitted for approval.
- I. Multi-Family Residential (3 or more units)
1. For triplexes or lots with three units, condominiums, or town homes, individual meters are required for each unit.
  2. For multi-family developments of 4-99 units, whether rental units or separate ownership units, design for individual meters for each unit or master meters with submeters on each unit.
  3. For complexes of 100 units or more, metering will be designed as in (2) above, except that at least two metered connections are required if the project is to be master-metered.
  4. See Section X. N. for irrigation meter requirements for any landscaped or common areas.
- All meters must be within public right-of-way or easements and multiple meters will be clustered where possible.
- J. Mobile Home Parks
1. Mobile home parks that have rental spaces shall have a master meter (two master meters if more than 100 spaces) or each unit may have an individual meter. Parks with individually-owned lots must have individual meters. When master meters are used, the mobile home park owner shall sub-meter to the tenants at their own expense, and must comply with PUC Requirements.
  2. Individual City meters must be clustered and located within the public right-of-way or easement.
  3. See Section X. N. for common area irrigation meter requirements.
- K. Mixed residential and commercial uses must have separate meters.
- L. Commercial
1. See Section X. N. below for irrigation requirements.

2. A minimum 2-inch domestic service lateral is required for commercial use, unless water use calculations show a smaller meter will accurately register the usage.
  3. Critical uses such as hospitals, jails, elderly care facilities, and others as determined by the City Engineer, require at least two separate water services for domestic use that must be connected to separately valved sections of the public water main.
- M. Combination Services for Private Fire Service with Domestic and/or Irrigation Service
1. Only 6-inch, 8-inch and 12-inch combination service laterals are allowed.
  2. The combination service lateral must equal or exceed the size of the required fire line and must be hydraulically sized to provide adequately combined domestic, irrigation, and fire flows without exceeding allowable velocity of 15 feet per second.
  3. A minimum 8-inch combination service lateral is required for lots with unknown commercial, multi-family, industrial and shopping centers uses where onsite hydrants are not likely to be required for development.
  4. A minimum 12-inch combination service lateral is required for lots with unknown commercial, multi-family, industrial or shopping center uses where onsite hydrants are likely to be required for development.
- N. Irrigation
1. Provide separate irrigation meters for landscaped areas of all commercial or multi-family uses.
  2. Provide separate irrigation meters for common areas of all condominium, town home, PUD, apartment complexes, and mobile home parks.
  3. Provide reduced pressure backflow devices for all irrigation services. Backflow devices must be specified on the irrigation plan and must conform to City Standard (see notes) and current USC Approved List of Devices.
  4. Sizing of irrigation meters will be determined by the design professional subject to approval by City Engineer. Irrigation meter size will be determined by the maximum flow required at the meter and will be based on AWWA criteria for meter sizing. Along with landscape and irrigation plans, the applicant must submit the planned square footage of planted areas and categories of plants to be used as selected from the following:
    - a. High water use plants: turf, annuals, and container plants;
    - b. Moderate water use plants: ornamental trees, shrubs ground covers, and perennials primarily irrigated by sprinklers. (Note that there may be some use of drip or bubblers in this category but not a predominance.)
    - c. Low water use plants: drought tolerant plants recognized as having a plant factor of 0.3 or less and irrigated primarily through drip emitters.
  5. Irrigation systems shall be constructed with purple pipe and fixtures.

## XI. PUBLIC IMPROVEMENTS FOR PRIVATE FIRE SYSTEMS

- A. Design plans showing private fire systems must be submitted to the appropriate Fire and/or Building jurisdiction for approval and may be included with the Public Improvement Plans for the project.
- B. Generally, the lateral size must be designed the same size or larger than the size required for the fire sprinkler system and/or the private hydrant system. **Caution** - onsite fire system design may necessitate changes to pre-approved public improvements. The hydraulic calculations for laterals serving private fire systems shall be based on the required fire flow per City fire code.
- C. All private fire systems that only serve onsite hydrants require above-ground approved backflow device double check valves in accordance with Standard 880. Below-grade devices such as detector checks or backflow devices are not approved.
- D. Double-check detector backflow assemblies are required for:
  - 1. All connections serving commercial fire sprinkler systems; or
  - 2. Any property with multiple fire service connections; or
  - 3. Any fire line connections to properties with auxiliary water supply.
  - 4. Private on site fire hydrants.
- E. Reduced-pressure detectors are required for:
  - 1. Any fire suppression system using chemical additives such as antifreeze or fire suppressants; or
  - 2. Any building where a potential hazard to the potable water system exists, as determined by the City Engineer.
- F. For one- and two-family detached (duplex) residential fire sprinkler systems:
  - 1. Services shall be designed in conformance with and as shown on City Standard 863A, shall be 1-inch minimum and must be located in the public right-of-way or the P.U.E. adjacent to the right-of-way, when required.
  - 2. Where a fire sprinkler system is to be installed in a single-family residential dwelling, design the service lateral from the street main to the water meter and the water meter to be 1-inch minimum. Larger size service laterals and meters may be permitted where hydraulic calculations indicate the need.
- G. The location of any Fire Department connection must be approved by the Fire Department.
- H. Critical uses such as hospitals, jails, elderly care facilities, and others as determined by the City Engineer and/or the Fire Marshal, require at least two fire

line service connections to separately valved sections of the public water main, so that service can be maintained in the event of a main line or service lateral shutdown.

## **XII. FIRE HYDRANTS**

- A. Design of hydrant locations must meet the Fire Code requirements and be approved by the Fire Department for logistics and by Public Works Utility Services for maintainability.
- B. Each hydrant must be on a separately valved main line section.
- C. Whenever possible, locate hydrants near street intersections.
- D. If it is not possible to locate near an intersection, locate the hydrant near a property line or where it will minimize interference with property use.
- E. Locate hydrants a minimum of 10 feet from roll down of driveways for commercial or multi-family sites and 5 feet from edge of single family detached residential driveway.
- F. On streets with raised medians or with four or more travel lanes, design hydrants on alternate sides of the street per current City Fire Code. Each side of the street will be considered independently relative to hydrant placement per subsections XII-G below.
- G. Residential property with one or two dwelling units per lot - Typical locations
  - 1. Design hydrants with a maximum of 500 feet spacing, or as approved by the Fire Department.
  - 2. Generally, design hydrants at intersections and then evenly distribute hydrants throughout the project.
  - 3. No one or two family dwellings may be more than 250 feet from the nearest hydrant.
- H. Commercial, Industrial, and Multi-family (3 or more units) per lot - Typical locations
  - 1. Generally, design hydrants at intersections or driveway entrances and then evenly distribute hydrants throughout the project.
  - 2. No portion of the exterior wall of the facility or building may be more than 150 feet from the nearest hydrant as measured by an approved route around the building per the City Fire Code.
- I. Minimum fire flow required at all hydrants:
  - 1. Fire flow as specified in the following subsections is defined as the amount of water supply available in the water main nearest the flowing hydrant with 20 psi residual pressure.

2. Single and two family residential uses require 1,500 gallons per minute flow, except as in subsection I. 4. of this section below.
3. The required fire flows for schools, commercial, industrial, and multi-family residential (3 or more units) uses will be based on the City Fire Code. The water system will be designed so that 1,500 gpm is available from the hydraulically most demanding hydrant and the remaining flow required is available at the next most demanding hydrant(s), up to a maximum of 1,500 gpm per hydrant.
4. Fire flow requirements are under the jurisdiction of the Fire Department. The guidelines given above are general. Actual flow requirements must be verified with the Fire Department prior to submittal of plans. Calculations may be required by the Fire Department to verify the adequacy of the proposed design. Mitigation measures may be required by the Fire Department if the minimum fire flow requirements cannot be met for a specific project.
5. The minimum hydrant lateral size is 6 inches and shall not exceed 50-feet in length without specific written approval of the City Engineer.

### **XIII. BACKFLOW PREVENTION ASSEMBLIES (EXCEPT FOR FIRE LINES)**

- A. Backflow prevention assemblies are required to be designed in accordance with State of California Title 17 and current City of Rohnert Park, Backflow Regulations.
- B. All backflow prevention assemblies must be listed on the latest revision of the approved USC Foundation for Cross-Connection Control and Hydraulic Research list. Additionally lists of approved backflow prevention devices may be obtained by consultants from the California Department of Public Health, see the following web-site <http://www.cdph.ca.gov/certlic/drinkingwater/Pages/Publications.aspx>
- C. Design backflow prevention assemblies as near as possible to the water meter as shown on Standards. Refer to Rohnert Park Standards 869 & 876.
- D. Backflow preventers will be designed in accordance with Appendix "A." For uses not listed contact Public Works Utilities or Water Quality.

### **XIV. PRESSURE**

- A. To obtain water system data for these calculations, contact Fire Division at (707) 584-2641. A fee will be imposed if flow testing is required.
- B. Mainline
  1. The maximum allowable static pressure in the system is 80 psi. The minimum allowable residual pressure in the system is 20 psi.
  2. The maximum allowable pressure in a high-level zone is calculated by assuming the reservoir full. In the Aqueduct zone or other reduced



pressure zones, calculate the pressure by using the high setting of the pressure regulating valve at the nearest aqueduct connection or system regulator.

3. The minimum allowable pressure in a high level zone is calculated by assuming the reservoir drawn down 10 feet from the high water level. In the Aqueduct zone or other reduced-pressure zones, use the low setting of the pressure regulating valve at the nearest aqueduct connection or system regulator.

C. Domestic service

1. The minimum allowable pressure is 20 psi measured at the meter. If pressure measured at any faucet is less than 35 psi, a pressure booster system is required.
2. If service pressure measured at any faucet exceeds 80 psi, a private pressure regulating device is required.

## **XV. SPECIALTY VALVES AND WATER SAMPLING STATIONS**

- A. Specific locations will be reviewed for each project by the City Engineer and Public Works Utility Services.
- B. Air release and vacuum relief valves are required at substantial high points in the system such as over a hilltop or at the upper end of a dead end main.
- C. Design pressure reducing valves to maintain overall system balance and to maintain service pressure levels within the parameters established within these system design standards.
- D. Typically surge or pressure relief valves are to be located near the low points of any high level pressure zone where discharge may be directed to an approved disposal system.
- E. Water sampling stations are required to provide representative sampling within each pressure zone. At a minimum, eight water sample stations are required in each pressure zone, one at each reservoir, at pump stations, and dead ends.
- F. Fire hydrants shall be used in lieu of blow-off valves at dead ends. Blow-off assemblies in other locations are allowed.

## **XVI. EASEMENTS**

- A. A Public Water System easement must be dedicated to the City over any public water system when it is designed to be installed outside a public right-of-way.
- B. The easement must be a minimum of 15 feet wide. The pipe shall be centered within the easement. Where more than one utility is in an easement, the minimum

width shall be increased to a minimum of 20 feet. Additional width may be required by the City Engineer. The easement will be dedicated as a Public Water System easement if it contains water only. It will be dedicated as a public utilities easement if it contains other facilities as well.

- C. Easements must be configured to encompass all publicly maintained appurtenances, such as water service laterals, meters and fire hydrants and will be generally centered over the facility. Separate access easements may be required depending on site conditions. When water mains are to be installed along a property line the easement will be wholly contained on one parcel.
- D. All property restrictions placed as a result of dedication of easements will be so noted on the Subdivision Map or on the Easement Deed if the easement is not dedicated as part of a subdivision. Required notes are:
  - 1. No structures may encroach on, above or below the surface of the ground in any public water easement. This includes footing of foundations or eaves from the roof of any adjacent structure, pools, ponds or outbuildings on slabs or foundations. Decks, sheds, or other structures which may be easily removed for maintenance of the water system may be allowed at the discretion of the City Engineer.
  - 2. No trees may be planted in a public water easement without first obtaining approval of the City Engineer. Trees may be allowed to the extent that damage to the water system does not occur from root intrusion and adequate access can be provided for maintenance and repair vehicles.

## **XVII. ABANDONMENT OF WATER MAINS AND SERVICES**

- A. Any existing water mains and service laterals that will not be used must be abandoned and must be shown on the Improvement Plans with appropriate notation.
- B. For all abandoned water services up to and including 2-inch, annotate to remove the valve and saddle and install a full circle clamp on main under Engineering Department/City inspection.
- C. For flanged, tapping tees or mechanical joint tees up to and including 2-inch, annotate the Improvement Plans to remove the valve and install a blind flange or mechanical joint plug under Engineering Department/City inspection.
- D. For all abandoned water services greater than 2-inch annotate on the plans to remove tee, valve and concrete thrust block and the main repaired with approved pipe and suitable couplings. under Engineering Department/City inspection
- E. Valve boxes for abandoned valves must be removed and so noted on the Improvement Plans.

- F. Abandoned mains, valves and risers located within any street structural section or within any new trench must be shown on the Improvement Plans to be removed.
- G. Show all water mains to be abandoned within the public right-of-way as removed or broken every 50 feet and filled with sand slurry pursuant to City Standard 507.
- H. Show all pipes 4 inches and over to be abandoned as removed or plugged every 50 feet.
- I. Where a fire hydrant is to be abandoned, note that the hydrant barrel, break off riser, and check valve are to be removed, the bury is to be capped or plugged, and the lateral abandoned at main as stated above. Abandonment of fire hydrants must be approved by the Fire Department.

**APPENDIX “A”**

**BACKFLOW DEVICE REQUIREMENTS**

<b>APPLICATION</b>	<b>TYPE OF ASSEMBLY</b>
Auto Sales, Painting, Repair, Radiator work	RP
Auxiliary Water Supply (Contaminated Wells, etc.)	RP
Barber Shops	RP
Blood Banks	RP
Boiler Systems (any)	RP
Buildings with Booster Systems	RP
Buildings with 3 or more Stories or with fixtures 30 feet above the service	RP
Buildings with Sewage Ejectors	RP
Buildings with Storage Tanks	RP
Homes with Sewage Lift Stations	RP
Car Wash	RP
Camp Grounds / Trailer Parks	RP
Cement, concrete, Sand & Gravel Plants	RP
Chemical Storage or Processing Facilities	RP
Dairy or Cold Storage	RP
Film Processing	RP
Fire Systems - Business/Residential (sprinklers with or without hydrants or private hydrants)	DC w/Det.Ck.
Fire Systems - w/Sprinkler in Hazardous Locations	RP
Gas Stations	RP
Gray Water System	RP
Heating & Air Conditioning (Using Water)	RP
Hospital or Medical Facility (any) Convalescent or Long Term Care	RP
Irrigation Systems	RP
Irrigation System w/Chemical Feed	RP
Laboratories (Commercial or Research)	RP
Laundry or Dry Cleaner	RP
Manufacturing or Processing (with Toxic Chemicals)	RP
Medical or Dental Facility (any)	RP
Mobile Home Park	DC w/Det. Ck./RP
Ornamental Pools, Ponds or Fountains	RP
Painting Auto Shops	RP
Printing Shops	RP
Radiator Shops (all)	RP
Radioactive Materials	RP
Restaurant	RP
Restricted or Classified Facilities	RP

<b>APPLICATION</b>	<b>TYPE OF ASSEMBLY</b>
Schools	RP
Sewage or Storm Drain Facilities	RP
Steam Cleaning Equipment (any type)	RP
Steam Generation	RP
Swimming Pools (Public and Commercial)	RP
Tank Trucks or Spray Rigs	RP
Veterinary Clinics	RP
Warehousing & Storage	RP
KEY: RP = Reduced Pressure DC w/Det. Ck. = Double Check w/Detector Check	