LIST OF FIGURES
CHAPTER 4 – WATER

CHAPTER 4

4.000 WATER

4.010 General

These standards apply only to the City of Gig Harbor Water Department's Water System. Any extension of the Gig Harbor Water System must be approved by the City Engineer. All extensions must conform to these standards, the Department of Health (DOH) requirements and the most current Gig Harbor Water System Plan. In the event of any conflict between the Public Works Standards and the *Water System Plan,* the *Water System Plan* will govern.

In designing and planning for any development, it is the developer's responsibility to see that adequate water for both domestic use and fire protection is attainable. The developer must show in the proposed plans how water will be supplied and whether adequate water flow and pressure will be attained in case of fire. A water hydraulic analysis of the system will be required.

Prior to the release of any water meters, all public works improvements must be completed and approved including granting of right-of-way or easements, and all applicable fees must be paid.

4.020 Design Standards

The design of any water extension/connection shall conform to City Standards and any applicable standards as set forth herein and in Section 1.010 and 1.040.

The layout of extensions shall provide for the future continuation and/or "looping" of the existing system as determined by the City. In addition, main extensions shall be extended as required in Section 1.130.

The General Notes on the following page shall be included on any plans dealing with water system design.

GENERAL NOTES (WATER MAIN INSTALLATION)

1. All workmanship and material shall be in accordance with City of Gig Harbor standards and the most current copy of the *WSDOT/APWA Standard Specifications for Road, Bridge and Municipal Construction*. In cases of conflict, the most stringent standard shall apply.

2. The Contractor shall be in compliance with all safety standards and requirements as set forth by OSHA, WISHA and the Washington State Department of Labor and Industries.

3. The Contractor shall be responsible for all traffic control in accordance with Section 2B.130 of the *Gig Harbor Public Works Standards*, the *WSDOT Standard Plans for Road, Bridge and Municipal Construction* and/or the *Manual on Uniform Traffic Control Devices* (MUTCD). Prior to disruption of any traffic, a traffic control plan shall be prepared and submitted to the City for approval. No work shall commence until all approved traffic control is in place.

4. All approvals and permits required by the City of Gig Harbor shall be obtained by the Contractor prior to the start of construction.

5. If construction is to take place in the County and/or Washington State Department of Transportation right-of-way, the Contractor shall notify the City. The City shall obtain all the required County and WSDOT permits. The Contractor shall adhere to all the permit requirements. The Contractor shall reimburse the City for associated permit fees.

6. A pre-construction meeting shall be held with the City of Gig Harbor Construction Inspector prior to the start of construction.

7. The Contractor shall be fully responsible for the location and protection of all existing utilities. The Contractor shall verify all utility locations prior to construction by calling the Underground Locate line at 811 a minimum of 48 hours prior to any excavation.

8. It shall be the responsibility of the Contractor to have a copy of an approved set of plans on the construction site at all times.

9. All surveying and staking shall be performed per the corresponding chapter of the *City of Gig Harbor Public Works Standards*.

10. Temporary erosion control/water pollution measures shall be required in accordance with Section 1-07.15 of the *WSDOT/APWA Standard Specifications for Road, Bridge and Municipal Construction* and the *Gig Harbor 2010 Stormwater Management and Site Development Manual*. At no time will silts and debris be allowed to drain into an existing or newly installed facility unless special previsions have been designed.

11. All pipe for water mains shall comply with one of the following types:

    Ductile Iron Pipe: Ductile iron pipe may be used on mains up to ten in. diameter. Ductile iron pipe shall be used on mains over ten in. in diameter. Ductile iron pipe shall conform to AWWA C 151 Class 52 and have a cement mortar lining conforming to AWWA C 104. All pipes shall be joined using non restrained joints which shall be rubber gaskets, push on type or mechanical joint, conforming to AWWA C 111.

    PVC Pipe: PVC pipe may be used on mains eight in. through 10 in. in diameter. All PVC pipe shall conform to the latest revision of AWWA C900 Class 200 standards, and shall be blue in color. See Section 4.030B for more detailed specifications.

12. Gate valves shall be epoxy coated resilient wedge, NRS (Non Rising Stem) with O-ring seals. Valve ends shall be mechanical joint or ANSI flanges. Gate valves shall conform to AWWA C515 Standard. Valves shall be Mueller, M & H, Kennedy, Clow R/W or Waterous Series 500. Gate Valves shall be used for all valves: 2 in. to 12 in.: the design, materials and workmanship of all gate valves shall be ductile iron body resilient wedge valves conforming to AWWA C515 latest revision. Gate valves shall be resilient wedge non-rising stem (NRS) with two internal O-ring stem seals. Butterfly Valves shall be used for all valves larger than 12 in. Butterfly valves shall conform to AWWA C504, Class 150B, with cast iron short body, O-ring stem seals, geared operator designed for underground installation, and a 2 in. square operating nut. Butterfly valves shall be Mueller, Linseal III, Kennedy, M & H, Pratt Groundhog, or Allis Chalmers.

13. Existing valves shall be operated by City employees only.

14. Hydrants shall be Mueller Super Centurion 250, or Clow Medallion 929 or MH EJIW 5CD250. Hydrants shall be bagged until system is approved.

15. All lines shall be disinfected and tested in conformance with the above referenced specification (Note 1) and Section 4.190 of the *Public Works Standards*. Microbiological testing of disinfected water mains shall be conducted only by laboratories that have been certified by the state Department of Health (DOH) for drinking water analysis. The City will only accept results from samples analyzed using method number 9221D or 9222B from *Standard Methods for the Examination of Water and Wastewater, 19th Ed.* (APHA et al. 1995), or corresponding methods from later editions. The City of Gig Harbor Construction Inspector will obtain water samples for microbiological testing and no main will be put into service until a passing test is achieved. It is the contractors/developers responsibility to achieve a passing test. If the initial microbiological test fails, contractor/developer shall flush and disinfect lines again, and a second test will be taken by the City. If this second test should fail, additional disinfection and flushing will be required along with any other means of cleaning the lines that is required by the City Engineer. All expenses incurred following the second failing bacterial test will be paid for by the contractor/developer.

16. All pipe and services shall be installed with continuous tracer tape installed 12 in. to 18 in. under the final ground surface. The marker shall be plastic non-biodegradable, metal core or backing marked water which can be detected by a standard metal detector. Tape shall be Terra Tape "D" or approved equal. In addition to tracer tape, install direct bury, U.S.E.14 gauge blue coated copper wire, wrapped around or taped to the pipe, as shown on Detail 4-08. Low voltage grease-type splice kits shall be used on tracer wire. Continuity testing of the wire will be done by the Contractor.

17. All service line locations shall be marked on the face of the curb with an embossed "W" 3 in. high and 1/4 in. into concrete.

18. The Contractor will provide the City 72-hours' notice prior to scheduling a main shutdown. Where connections require "field verification", connection points shall be exposed by the Contractor and fittings verified 72 hours prior to distributing shut down notices.

19. All water mains shall be staked for grades and alignment by a professional land surveyor capable of performing such work.

20. Separation between water and sewer shall be maintained per Department of Ecology (DOE) standards.

21. A concrete pad per detail 4-08 shall be installed around all valve boxes and blow-offs that are not in a pavement area.

22. No physical connection to the existing water system will be allowed until the new water main has passed a hydrostatic pressure test and microbiological test.

23. The minimum cover depth over all water lines shall be 36 in. unless otherwise noted on the plans.

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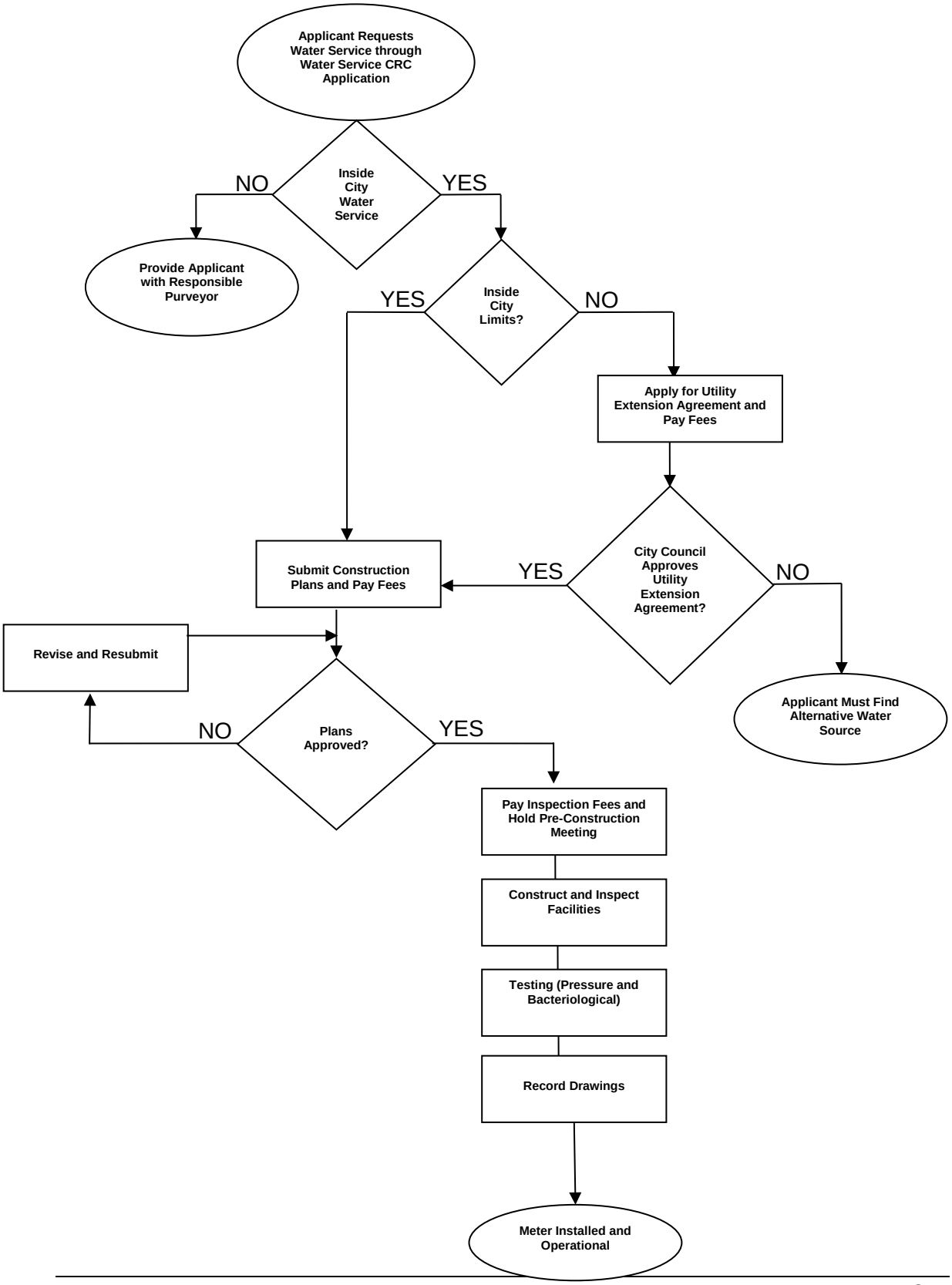
Figure 4-1 Process to Obtain Water Service



4.025 Wellhead Protection Areas

Private wells within the City of Gig Harbor shall comply with Department of Health and Department of Ecology standards.

The wellhead protection area designated for each of the City's wells is an irregular boundary determined by topography, water flow patterns (both above and below ground) soil types, flow rates and other criteria. Please contact the Public Works Plan review staff or the Tacoma-Pierce County Health Department to determine if your project is situated within a wellhead protection area. In order to protect the public water supply, the following criteria shall apply to any project or portion of a project which is partially or completely located within a wellhead protection area.

- All storm water shall be directed away from the well's 100-foot sanitary setback.

- A storm and erosion control plan requiring treatment of storm water is required. Depending on the individual characteristics of the project, and the susceptibility of the particular wellhead to contamination, more stringent treatment requirements than those required in the *City of Gig Harbor Stormwater Management and Site Development Manual* (most current addition) may be imposed by the City.

- If the project is to be platted, it must be noted within the covenants of the plat and in the General Notes of any engineering plans that the project is located within the one, five, or ten year time-of-travel zone wellhead protection area.

- All garbage bins and dumpsters, except in single family subdivisions, shall be covered in a manner that prevents rainwater from entering the containers. A sanitary drain shall be provided for compaction-style dumpsters that may generate leachate.

- In commercial projects, where hazardous products are stored or used, a spill and containment plan shall be implemented. Depending on the nature of a project, more stringent spill and containment requirements than those required in the *Gig Harbor Management and Site Development Manual* may be imposed by the City.

4.030 Main Line

A. Water mains shall be sized in accordance with Chapter 2 of the Water System Plan. Water mains sizes shall be verified by hydraulic analysis to provide adequate domestic flow plus fire flow at the required residual pressure. Fire flow requirements will be determined by the Gig Harbor Fire Marshal and the City of Gig Harbor Water System Plan. Check with Gig Harbor Fire Marshal for Class U requirements. Fire hydrants shall be located on water mains 8 in. diameter or larger.

B. All pipe for water mains shall comply with the City's General Notes for water main installation.

C. All fittings shall be ductile iron compact fittings conforming to AWWA C 153 or Class 250 gray iron conforming to AWWA C 110 and C 111. All shall be cement mortar lined conforming to AWWA C 104. Plain end fittings shall be ductile iron if mechanical joint retainer glands are installed on the plain ends. All fittings shall be connected by flanges or mechanical joints.

D. All pipe and services shall be installed with continuous tracer tape installed 12 to 18 in. under the final ground surface. The marker shall be plastic non-biodegradable, metal core or backing which can be detected by a standard metal detector. Tape shall be Terra Tape "D" or approved equal. In addition to tracer tape, install 14 gauge, direct bury, U.S.E. blue coated copper wire, wrapped around or taped to the top of pipe, brought up and tied off at valve body as shown on detail 4-08.

E. The minimum cover for all water mains from top of pipe to finish grade shall be 42 in. unless otherwise approved. If the pipe is offset to the edge of the road, the actual roadway cross grade shall be projected out and used to measure cover to top of pipe.

4.040 Connection to Existing Water Main

The developer's engineer shall be responsible for determining the scope of work for connection to existing water mains. Cut-in tees may be allowed only with the approval of the City Engineer. See detail number 4-07.

It shall be the Contractor's responsibility to field verify the location and depth of the existing main and the fittings required to make the connections to the existing mains.

No tap shall be made to an existing main on a Friday without City approval.

A City representative shall be present throughout the entire connection or tapping procedure.

No physical connection to the existing City water system will be allowed until the new main has passed a hydrostatic pressure test, and a microbiological test. Temporary blocking and blow offs will need to be incorporated into the new main construction until these tests have been passed. At that point connecting fittings and pipe will need to be thoroughly cleaned and disinfected prior to the connection to the existing system. The City Construction Inspector must be present to witness all tie-ins.

4.050 Service Interruption

The Contractor shall give the City a minimum of 72-hours' notice of any planned connection to an existing pipeline. This includes all cut-ins and live taps. Notice is required so any disruptions to existing services can be scheduled. The City will notify customers involved or affected by the water service interruption. The Contractor shall make every effort to schedule water main construction with a minimum interruption of water service. In certain situations, the City may dictate scheduling of water main shutdowns so as not to impose unnecessary shutdowns during specific periods to existing customers.

4.060 Hydrants

A. The lead from the service main to the fire hydrant shall be as specified on detail 4-01.

B. Fire Hydrants shall have two, 2-1/2 in. outlets and one, 4-1/2 in. pumper port outlet fitted with a 5 in. Stortz adapter. All outport threads shall be national standard thread. The hydrant operating nut shall always open counter-clockwise. The valve opening shall be 5-1/4 in. diameter. The hydrant shall have a positive and automatic barrel drain. Hydrant shall be of the "safety" or break-away style. All exposed portions of the hydrants shall be field painted with one coat of paint approved by the City Engineer prior to final acceptance.

C. The Public Works Department and the Gig Harbor Fire Marshal shall work together to insure that adequate hydrant spacing and installation are achieved.

Unless otherwise required by the governing authority, the following guidelines shall apply for hydrant number and location. Spacing shall be measured to the pathway required for the Pierce County Fire District 5 to lay the fire hose. This spacing shall be determined by the Gig Harbor Fire Marshal.

1. At least one hydrant shall be installed at all intersections.

2. Fire hydrant spacing shall conform to the City of Gig Harbor Fire Marshal requirements and Appendix C of the International Fire Code.

3. Where a cul-de-sac or dead end exceeds 200 feet from the center of the intersection to the end of the cul-de-sac, a hydrant shall be located at the intersection and additional hydrants shall be required in accordance with Appendix C of the International Fire Code.

4. Where hydrants are located on private property, easements shall be provided. Easements shall be to the benefit of the City of Gig Harbor and Pierce Co. Fire District #5.

5. A two-way, blue reflective hydrant marker shall be required perpendicular to each hydrant. Hydrant markers shall be placed six in. from the centerline on the same side of the road as the hydrant.

6. In addition to any approvals by the City Engineering Department, installation of all private fire service mains serving fire sprinkler and/or standpipe systems shall require a permit and inspections from the building and fire safety department.

   A scaled down plan view of the proposed water system shall be included on the plans. The scale shall be appropriate to show the entire proposed system. This plan view shall show the location of all the proposed hydrants plus the location of the appropriate existing hydrants adjoining the project. If the project only includes the addition of one or two new hydrants, the location of at least two existing hydrants in the project vicinity need to be shown on the plan view.

E. Fire hydrants shall be set as shown in standard detail number 4-01.

F. For requirements regarding use, size and location of a fire department connection (FDC) and/or post indicator valve contact the Gig Harbor Fire Marshal. Location of FDC shall be shown on water plans.

G. Where needed, the Engineering Department or the Gig Harbor Fire Marshal may require hydrants to be protected by two or more bollards. See detail 4-12.

H. Fire hydrants meeting required fire flow must be installed, tested, and accepted prior to the issuance of a building permit in new subdivisions and short plats. Fire hydrants must be installed, tested, and accepted prior to bringing combustible materials on to the site for other construction.

4.062 Hydrant Meters

The City of Gig Harbor requires that Contractors and Developers use a hydrant meters to monitor the usage of construction water. The Contractor/developer is required to provide their own hydrant meter and backflow preventer that is to be approved for use by the City of Gig Harbor Construction Inspector. The Contractor/developer shall set up an account with the Public Works Department Utility Billing Clerk for the water that is to be use on the construction site. Charges for the amount of water used will be assessed on a bi-monthly time period or when the project is requesting final inspection. All water usage fees shall be paid prior to project final approval.

The Contractor shall insure that measures to prevent backflow, cross connections and contamination of the City system comply with the Cross Connection Control Procedures and Practices. The Contractor will be required

to install, at a minimum, a double check valve on the hydrant meter being used. The Contractor will also be required to have the check valve tested by an independent certified back flow assembly tester and shall provide a passing test report on the back flow device to the City Construction Inspector prior to using the hydrant meter for construction water. When using the hydrant meter to fill a vehicle, the vehicle must be equipped with an approved anti-siphon air gap. The air gap shall be at least twice the diameter of the inlet pipe.

4.065 Sprinkler Underground Line

This section refers to building fire sprinkler lines and not irrigation or landscape sprinkler lines.

A. A permit is required from the building and fire safety department prior to installation of any fire sprinkler or standpipe mains, valves, or other system appurtenances.

B. The City Fire Marshal will witness all testing and flushing of underground sprinkler and standpipe piping. Underground piping shall be installed in accordance with the Gig Harbor Municipal Code and NFPA Standards13 and 24.

C. The sprinkler underground line shall not be tested until the City has tested and approved the distribution main up to the City valve. See drawing 4-28 for a map clarifying the location of the City valve and the sprinkler or standpipe underground piping.

D. If a double check valve assembly (DCVA) is not located in a public right – of-way, easements for the DCVA to the benefit of the City and Pierce Co. Fire District #5 shall be required. The sprinkler/standpipe underground line shall be that portion of the line located behind the City valve.

E. In no instance shall domestic or irrigation service connections be made to the sprinkler underground line.

F. See Section 4.110 “Backflow Prevention” for additional information.

4.070 Valves

All valves and fittings shall be ductile iron with ANSI flanges or mechanical joint ends. **All existing valves shall be operated by City employees only.**

Valves shall be installed in the distribution system at sufficient intervals to facilitate system repair and maintenance, but in no case shall there be less than one valve every 1000 feet. Generally, there shall be three valves on each tee and four valves on each cross. Valves installed with tees and crosses shall be flanged together. All valves shall open in a counter-clockwise direction when standing on the ground surface. Specific requirements for valve spacing will be made at the plan review stage.

A. Valve Box: All valves shall have a valve box set to grade with a slip type cast iron base from valve to within 5 in. of valve box top. If valves are not set in paved area, a concrete pad shall be set around each valve box at finished grade. In areas where valve box falls in road shoulder, the ditch and shoulder shall be graded before placing asphalt or concrete pad. See detail 4-08.

B. Valve Marker Post: Valve marker posts shall be 4 in. x 4 in. reinforced concrete or schedule 40 steel posts 5 feet long stamped with "W" and distance to valve. Post shall be painted with 1 base coat and 2 coats white oil base enamel. The need for valve marker posts will be determined during plan review. See detail 4-12.

4.080 Air and Vacuum Release Valve

Air and vacuum release valves (ARV) shall be as shown on detail 4-15 and 4-16 for mains up to 12 in. in diameter. The engineer shall size the ARV for mains 14 in. in diameter and larger.

ARV's must be installed so as not to create a cross connection situation.

The installation shall be set at the high point of the line when required. ARV's shall not be installed in areas subject to high ground water or flooding. Drains may be required to insure that no standing water will accumulate in the air release manhole. Where possible, pipes are to be graded to prevent the need for an air release valve.

4.090 Blowoff Assembly

Blowoff assemblies will not be allowed at the end of dead-end mains unless approved by the City Engineer. Hydrants will be set at the end of all dead-end mains and will act as the blowoff. See Section 4.060 for hydrant requirements.

4.100 Backflow Prevention

Backflow prevention shall be installed in accordance with Title 13.06 GHMC, Ordinance No. 1331.

The installation of required backflow devices is necessary to protect the existing water system and users from possible contamination. All water system connections to serve newly constructed and existing buildings; properties with domestic potable water; sprinkler underground lines or irrigation systems shall comply with the minimum backflow prevention requirements as established by the Department of Health (DOH), the American Water Works Association (AWWA) Standards, and the City of Gig Harbor. When a backflow prevention assembly is required, plans must be submitted to the City of Gig Harbor for review prior to installation.

All backflow devices must be inspected and approved by a certified backflow device tester prior to use. Cross connections with the City of Gig Harbor water system shall be prohibited under all circumstances.

The City shall be provided with a successfully completed test report of any backflow prevention device before releasing the certificate of occupancy on any building. See Section 4.065 for additional information regarding sprinkler underground lines.

Refer to Section 4.062 for requirements when filling vehicles with a hydrant meter.

4.110 Service Connection

A. All service connections relating to new development shall be installed by the developer at the time of mainline construction. Services shall not be connected to a hydrant lead or the sprinkler underground line. After all the public works improvements are approved, the owner may apply for a water meter. Bonding may be allowed for commercial projects only. The City will install a water meter after the application has been made and all applicable fees have been paid. Water meters will be set only after the system is inspected and approved.

B. When water is desired to a parcel fronting an existing main but not served by an existing service line, an application must be made to the City. Upon approval of the application and payment of all applicable fees, the City will tap the main, and install the meter, saddle, service line, box, and setter.

Service taps larger than 2 in., connecting to an existing main, shall be made by the Contractor per Section 4.040. Service taps that require crossing an arterial street in excess of two-lane widths shall be made by the Contractor. These types of services shall be denoted on the plans.

C. Service lines shall be as specified herein. No glued joints will be accepted. Service lines shall be installed perpendicular to and 22 ½° above horizontal of the main. Tracer tape and wire wrapped around the pipe shall be installed on all service lines. Service line locate wire will be spliced into main line locate wire using low voltage grease type direct bury splice kits.

One inch diameter service lines shall be pressure class 200, polyethylene plastic pipe manufactured from all virgin material, category 5, grade P34, class C high density polyethylene ID ASTM D2239-SDR7 PE3408; cell classification 335434C to 355434C from Philips Driscopipe, Eagle Pacific (3408), Superlon Plastics, or approved equal and **shall be BLUE in color**.

1½ in. to 2 in. diameter service lines shall be pressure class 200, polyethylene plastic tubing manufactured from all virgin material category 5, grade P34, class C high density weight polyethylene OD ASTM D2737-SDR7 PE3408 or ASTM D2239-SDR7 PE3408; cell classification 335434C to 355434C, from Philips Driscopipe, Eagle Pacific (3408), Superlon Plastics, or approved equal and **shall be BLUE in color**. 2 in.

service lines shall have a 2 in. gate valve set on main at point of connection. Pressure Reducing Valves may be required per the National Plumbing Code and the Building Officials requirements. Pressure reducing valves (PRV's) shall be installed on the customer's side of the water meter. Operation and maintenance of the PRV will be the responsibility of the property owner.

D. Master meters will not be allowed for service to more than one per building. Deviations to this may be granted by the City Engineer. An approved backflow prevention assembly must be installed in conjunction with any master meter.

E. When connection to the public water system is desired by a residential customer connected to an existing well, a physical disconnect from the well must be made. This is necessary to assure that an unapproved auxiliary water supply (the customer's well) will not contaminate the City's water supply. The customer's well may be kept serviceable for irrigation purposes provided it is in compliance with DOE setback standards. If the well is not decommissioned per DOE standards upon connection to the City water supply, the customer is required to install an approved reduced pressure (RP) backflow device on the customer side of the meter. No water meter will be installed until a cross connection inspection has been completed to the satisfaction of the City.

When connection to the public water system is desired by a commercial customer connected to an existing well, or with a well on site, a physical disconnect from the well must be maintained. The customer's well may be kept serviceable for irrigation purposes only, provided it is in compliance with DOE setback standards. If a well is going to be used for irrigation, an RP device as approved by DOH shall be required. If an existing well is not going to be used for irrigation purposes, it must be decommissioned per DOE standards. No water meter will be installed until the RP device is installed and a cross connection inspection has been completed to the satisfaction of the City.

F. Lots or pads created by plats, re-plats, short plats, or binding site plans shall have a water service installed as required below.

In single family subdivisions (including mobile home and manufactured home subdivisions), a service shall be provided to each lot or pad, including open tracts and landscaping in the right-of-way. If a domestic and an irrigation meter are desired at a particular lot or tract, additional services shall be installed.

Duplexes shall have a separate service installed for each living unit regardless of how many duplexes are on a single lot. Example: One duplex on one lot shall have two services, two duplexes on one lot shall have four services and so on. A subdivision of duplexes shall have at least one service installed at all open tracts.

Multi-family and commercial complexes shall have at least one meter installed per separate building and a separate irrigation meter(s) for open spaces and landscaping. Additional meters to a multi-family or commercial building may be installed if desired. At least one service shall be installed at all open tracts. Master meters shall meet the criteria as outlined in 4.120D above.

G. Sample stations per detail 4-19 may be required. The requirement for the location of the sample station will be determined by the City during the plan review. Sample stations shall be located behind the walk, in an open space, or in a utility easement whenever possible and shall generally be centrally located in the project at a low point if possible.

H. Service configuration shall be as shown on details at the end of this chapter. Water meters 4 in. and larger shall not be placed in a traffic bearing location. For services larger than 4 in., the engineer shall submit a detail for approval that addresses the following:

- Meter type (turbine, compound, magnetic etc.) and size.
- A valve shall be located on both sides of the meter.
- A lockable bypass is required.
- Check valves shall be required on the bypass and the meter.
- Supports (jack stands) are required under the meter and bypass.
- The vault specified shall provide an 18” clear space from the vault wall to the closest edge of the meter, valves, or pipe.
- The vault shall have a double lid with a reader lid insert or have a remote readout display.
- The distance from the top of the meter to the bottom of the lid shall be 24 in. minimum and 30 in. maximum.
- A ladder shall be provided in the vault.
- Drainage must be provided for the meter pit.

4.120 Construction Water Policy

The goal of this section is to assure a consistent, fair and equitable approach for allowing potable City water to be used for construction purposes. It is the further intent of this policy to ensure the City’s water distribution system is not compromised due to construction practices.

Construction water is not to be used for irrigation purposes.

The use of construction water shall not create a backflow, cross connection or contamination potential with the City water supply.

If the site to be served by construction water is on a STEP sewer system, the STEP sewer system must be installed, tested, and approved prior to the City installing the water meter. Construction water may be used to fill and test the STEP tank provided that it does not create a cross connection potential.

A. Single Family Residential Construction Requirements:

1. The subject parcel is within the City's water service area.

2. All required Public Works improvements have been completed.

3. Construction water for each individual lot or parcel is required. The City will charge a flat fee for this service for a period not to exceed 90 days.

4. Each individual lot or parcel will pay utility connection charges for water services in addition to the construction water charge. These charges must be paid before a water meter will be dropped. Connection charges include but are not limited to: sewer, stormwater, tap, drop, general facility charges, and latecomer's fees. The City will require at least 48 hours' notice prior to dropping meters. All charges must be paid at City Hall.

5. The contractor/developer will supply their own construction bib to obtain water from the setter. A vacuum breaker is required on all construction bibs and must be in place at all times.

B. Commercial Construction Requirements:

1. The subject parcel is within the City's water service area.

2. All public works improvements have been completed.

3. Construction water may only be obtained through a hydrant meter and backflow preventer supplied by the contractor/developer and inspected by the City prior to use. The contractor/developer is required to supply a backflow device on all construction meters and must provide a current inspection certification for all backflow devices. All water used for construction must be metered.

4. The City will charge the Contractor/Developer for construction water based on "before and after" meter readings. (See Section 4.062 Hydrant Meters.)

4.125 Marking Service Lines

The location of all service lines shall be marked on the face or top of the cement concrete curb with a "W" 3 in. in height and 1/4 in. into the concrete. When an asphalt rolled curb is allowed, the water shall be marked with a tag secured with a "PK" nail one-foot toward centerline from the gutter. The tag shall be a minimum 1 1/4 in. diameter, 0.050 in. thick aluminum disk stamped "W" or an unstamped blue plastic equivalent.

4.130 Potable Water/ Non- Potable Crossings

Potable water mains are recommended to maintain 10 feet horizontal and 18 in. vertical separation (Note: separation distance should be measured as the distance from the closest sides of the outside of the two pipes) above non-potable pipelines (i.e., sanitary sewers, reclaimed water piping, irrigation lines, etc.) If site conditions do not allow such minimum separations, pipelines may be located closer to each other provided additional precautions are identified and instituted to assure protection of the potable line. At a minimum, potable water mains should maintain a minimum 5 feet horizontal and 12 in. vertical separation clearance from non-potable conveyance systems.

Potable and non-potable pipelines may be located in a common trench if the horizontal spacing between outer pipe walls is at least 5 feet and the vertical spacing is at least 18 in. from the invert wall of the potable line to the crown wall of the non-potable line. The non-potable line should be below the potable line on a 'bench' of undisturbed soil. If the minimum separation distances cannot be maintained, one or both of the pipelines should be encased with a structurally sound material such as concrete, CDF, or a larger pressure rated pipe (sleeve). Pressure rated pipe (sleeve) shall be at a minimum C900 PVC when protecting PVC or HDPE pipe, and Ductile Iron when protecting steel or ductile iron pipe.

For pipe crossings where the potable line is closer than 18 vertical in. from the non-potable line or the potable line must cross under the non-potable line, the potable line should be cased with pressure- rated pipe extending a minimum of 10 feet to either side of the crossing. To accommodate crossings, the minimum cover for a water main of 36 in. may be reduced to 24 in. upon approval by the City to provide for as much vertical separation as possible. When a reduced depth is allowed, ductile piping and/or casings may be required.

The longest standard length of water pipe shall be installed so that the joints will fall equidistant from any sewer crossing. In some cases where minimum separation cannot be maintained, it may be necessary to encase the water pipe and/or the sewer service per DOE Criteria for Sewage Works Design. No concrete shall be installed unless specifically directed by the City.

Situations not addressed below shall follow the criteria as outlined in the above mentioned document, most current edition.

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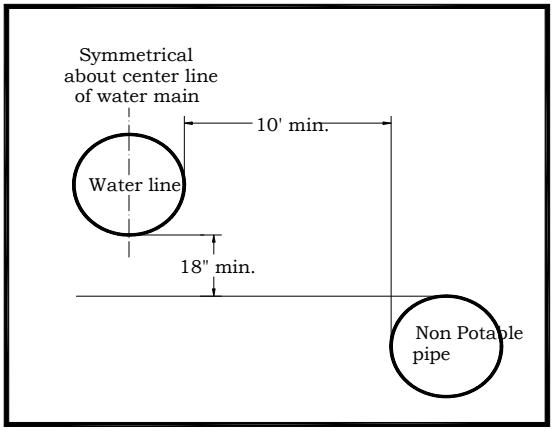
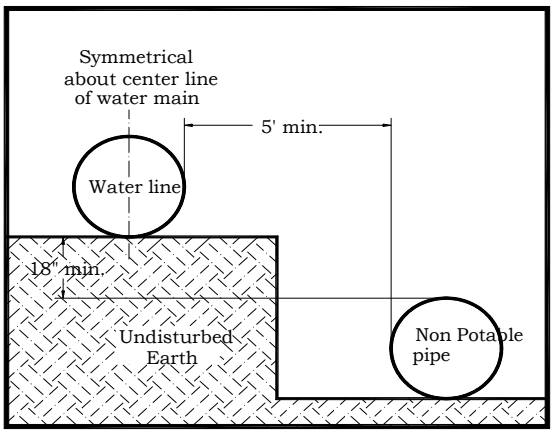
Figure 4-2 Potable Water/ Non- Potable Crossings



Required Separation between Water Lines and Non Potable Pipe,
Parallel Construction



Required Separation between Water Lines Non Potable Pipe,
Unusual Conditions Parallel Construction

4.145 Thrust Blocking

Location of thrust blocking shall be shown on plans. Thrust blocks shall comply with detail number 4-17 and 4-18. Thrust blocks shall consist of Class B concrete poured against undisturbed earth. A plastic barrier shall be placed between all thrust blocks and fittings. The addition of restrained joint fittings may not eliminate the need for thrust blocking.

4.150 Staking

All surveying and staking shall be performed by an engineering or surveying firm capable of performing such work. The engineer or surveyor directing such work shall be licensed as a professional land surveyor by the State of Washington.

A preconstruction meeting shall be held with the City prior to commencing staking. All construction staking shall be inspected by the City prior to construction.

The minimum staking of waterlines shall be as directed by the City Engineer or as follows:

A. Stake centerline alignment every 50 feet with cut or fill to invert of pipe maintaining 36 in. of cover over pipe.

B. Stake location of all fire hydrants, hydrant flange elevations, tees, water meters, setters and other fixtures and mark with cut or fill to finished grade.

4.160 Trench Excavation

A. Clearing and grubbing where required shall be performed within the easement or public right-of-way as permitted by the City and/or governing agencies. Debris resulting from the clearing and grubbing shall be disposed of by the owner or Contractor in accordance with the terms of all applicable permits.

B. Trenches shall be excavated to the line and depth designated by the City to provide a minimum of 42 in. of cover over the pipe, as shown in detail 4-05. Except for unusual circumstances where approved by the City, the trench sides shall be excavated vertically and the trench width shall be excavated only to such widths as are necessary for adequate working space as allowed by the governing agency. The trench shall be kept free from water until joining is complete. Surface water shall be diverted so as not to enter the trench. The owner shall maintain sufficient pumping equipment on the job to insure that these provisions are carried out.

C. The Contractor shall perform all excavation of every description and whatever substance encountered and boulders, rocks, roots and other obstructions shall be entirely removed or cut out to the width of the trench and to a depth 4 in. below water main grade. Where materials are removed from below water main grade, the trench shall be backfilled to grade with material satisfactory to the City and thoroughly compacted.

D. Trenching and shoring operations shall not proceed more than 100 feet in advance of pipe laying without approval of the City and shall be in conformance with Washington Industrial Safety and Health Administration (WISHA), Washington Department of Labor and Industries (L & I) and the Office of Safety and Health Administration (OSHA) Safety Standards.

E. The bottom of the trench shall be finished to grade with hand tools in such a manner that the pipe will have bearing along the entire length of the barrel. The bell holes shall be excavated with hand tools to sufficient size to make up the joint.

4.170 Backfilling

Backfilling and surface restoration shall closely follow installation of pipe so that not more than 100 feet is left exposed during construction hours without approval of the City. Pea gravel shall NOT be used as bedding or backfill of water piping or structures.

4.175 Street Patching and Restoration

See Section 2 for requirements regarding street patching and trench restoration.

4.180 Testing and Disinfection

Microbiological testing of disinfected water mains shall be conducted only by laboratories that have been certified by the state DOH for drinking water analysis. The City will only accept results from samples analyzed using method number 9221D or 9222B from *Standard Methods for the Examination of Water and Wastewater, 19th Ed.* (APHA et al 1995), or corresponding methods from later editions.

The water main pipes shall be disinfected and tested before being placed in service. Water for testing and disinfecting shall be obtained by the developer by arrangement with the City. All pumps, gauges, plugs, saddles, corporation stops, miscellaneous hose and piping, and measuring equipment necessary for performing the test shall be furnished, installed and operated by the developer. Feed for the pump shall be from a barrel or other container, wherein the actual amount of "makeup" water can be measured periodically during the test period. The section to be disinfected shall be thoroughly flushed at maximum flow prior to chlorination.

The pipeline shall be backfilled sufficiently to prevent movement of the pipe under pressure. All thrust blocks shall be in place and time allowed for the concrete to cure before testing. Where permanent blocking is not required, the developer shall furnish and install temporary blocking. No physical connection to the City's existing water system will be allowed until a passing microbiological test is acquired. The contractor/developer will be responsible for all cost associated with bacterial testing per the City's Construction Fee Schedule. Two tests will be conducted on any hydrant, double check valve assembly, pressure reducing valve installed on main lines or section of water main up to 500' in length. An additional sample will be taken for every 500' of main installed if mainline installation that exceeds 500'. Additional samples may be required at the discretion of the City's Construction Inspector. In the event that a sample fails microbiological testing, all retesting costs and reimbursement for City Construction Inspectors wages shall be paid for by the contractor/developer.

4.181 Hydrostatic Pressure

Prior to the acceptance of the work, the installed pipeline shall be subjected to a hydrostatic pressure test per Section 7-09.3 of the WSDOT Standard, latest

edition. The main shall be pumped up to 150 psi over static line pressure but in no case shall the test pressure be less than 225 pounds per square in. for a period of not less than 15 minutes for all lines. All tests shall be made with the hydrant auxiliary gate valves open and pressure against the hydrant valve. Hydrostatic tests shall be performed on every complete section of water main between two valves and each valve shall withstand the same test pressure as the pipe with no pressure active in the section of pipe beyond the closed valve. No physical connection to the City's existing water system will be allowed until the new line passes hydrostatic test.

Defective materials or workmanship, discovered as a result of the tests, shall be replaced. Whenever it is necessary to replace defective material or correct the workmanship, the tests shall be rerun at the developer's own expense, until a satisfactory test is obtained.

The pipe shall also be disinfected when being tested. As each length of pipe is laid, calcium hypochlorite or other disinfecting agent, having an available chlorine content of about 45 percent shall be placed in the pipe in sufficient quantities to give a dosage of about 50 ppm available chlorine, calculated on the volume of water which the pipe will contain.

The disinfectant may be placed in the upstream or high pressure end of the pipe. The following table shows the amount of high test calcium hypochlorite which should be used in each 20 foot length of pipe of various sizes:

Figure 4-3 Hydrostatic Pressure

PIPE SIZE (Inside Diameter in In.)	**HIGH TEST HYPOCHLORITE REQUIRED** (Ounces per 20-foot length to give 50 ppm available chlorine)
2, 3, 4 & 4	0.4
8	0.7
10 & 12	1.0
14	2.0

The calcium hypochlorite or other disinfecting agent used for this purpose shall be furnished by the developer.

When the line is complete and ready to disinfect, water shall be allowed to flow in slowly so not to displace the chlorine agent, until it appears at the far end of the line. The system shall then be flushed through the fire hydrants or into the next section, until a test shows no more than 0.2 ppm available chlorine. If any of the materials need to be replaced, the line shall again be disinfected and tested. The line may be pressure tested. The line may be pressure tested at the same time it is disinfected.

The water system will not be acceptable to the City until a receipt of a satisfactory report from the County or State Department of Health on water samples submitted to that office for bacteriological analysis. Should the initial

treatment result in an unsatisfactory bacteriological test, the original chlorination procedure shall be repeated by the Contractor until satisfactory results are obtained. The sample can only be taken on Mondays, Tuesdays, and Wednesdays until noon. Testing and sampling shall take place after all underground utilities are installed and compaction of the roadway section is complete.

The Contractor shall provide all necessary equipment and shall perform all work connected with the tests. The test pump shall be clean and disinfected and shall only be used on potable water supplies. Tests shall be made after all water main and service connections have been made and the roadway section is constructed to subgrade. The Contractor shall perform the test to assure that the equipment to be used for the test is adequate and in good operating condition and the air in the line has been released before requesting the City to witness the test.

See Section 4.110 for testing responsibilities for backflow prevention devices.

4.185 Irrigation

All irrigation systems located within the public right-of-way shall be designed by a State of Washington registered landscape architect or City approved design firm. Parts lists shall be submitted with each project.

The general notes on the following pages are required on all plans for City operated or maintained irrigation systems or on any owner association operated or maintained irrigation systems located within the public right-of-way.

Irrigation systems shall be installed with an approved backflow prevention assembly in accordance with Section 4.110 of this manual and approved by AWWA and the Department of Health. Backflow devices will be required to be tested by a certified tester prior to the setting of irrigation meter and before final acceptance is granted.

The irrigation system shall be installed after the area has been properly prepared. See Section 2B.125 for soil preparation requirements. The pipe trenches shall be no wider than is necessary to lay the pipe or install equipment. The top 4 in. of topsoil shall be kept separate from the subsoil and shall be replaced as the top layer when backfill is made.

Irrigation sprinklers shall be situated so as to not wet any public street or sidewalk. Turf heads shall be 1/2 in. above finished grade as measured from the top of the sprinkler. Shrub heads shall be placed on risers approximately 12-in. above finished grade unless otherwise specified. Drip irrigation emitters shall be installed in accordance with the manufacturer’s recommendations.

Installation and maintenance of irrigation systems in roadway planter strips shall be as shown in the table below. The system maintainer shall be responsible for the on-going water and power expenses incurred.

Figure 4-4 Irrigation

	Single Family Residential Zones	Multi-Family & All Other Zones
Arterial Boulevard	Developer installs, Homeowners Association maintains.	Developer installs. Owner or Owners Association maintains.
Arterials	Developer installs, Homeowners Assn. maintains.	Developer installs. Owner or Owners Association maintains.
Collectors	Developer installs, Homeowners Assn. maintains	Developer installs, Owners Association maintains
Residential	Builder installs & homeowner maintains	Owner installs, owner maintains

GENERAL NOTES (IRRIGATION SYSTEMS)

1. All workmanship, material and testing shall be in accordance with the City of Gig Harbor Public Works Standards, the National Electrical Code and the most current copy of the *WSDOT Standard Specifications for Road, Bridge and Municipal Construction* unless otherwise specified below. In cases of conflict, the most stringent standard shall apply.

2. The Contractor shall be in compliance with all safety standards and requirements as set forth by OSHA, WISHA and the Washington State Department of Labor and Industries.

3. The Contractor shall be responsible for all traffic control in accordance with Section 2B.126 of the *Gig Harbor Public Works Standards*, the *WSDOT/APWA Standard Plans for Road, Bridge and Municipal Construction* and the *Manual on Uniform Traffic Control Devices* (MUTCD). Prior to disruption of any traffic, a traffic control plan shall be prepared and submitted to the City for approval. No work shall commence until all approved traffic control is in place.

4. All approvals and permits required by the City of Gig Harbor shall be obtained by the Contractor prior to the start of construction.

5. If construction is to take place in the County and/or Washington State Department of Transportation right-of-way, the Contractor shall notify the City 10 working days in advance of construction. The City shall obtain all the required County and WSDOT permits. The Contractor shall adhere to all the permit requirements. The Contractor shall reimburse the City for associated permit fees.

6. A pre-construction meeting shall be held with the City of Gig Harbor Construction Inspector prior to the start of construction.

7. The Contractor shall be fully responsible for the location and protection of all existing utilities. The Contractor shall verify all utility locations prior to

construction by calling the Underground Locate line at 811 a minimum of 48 hours prior to any excavation.

8. It shall be the responsibility of the Contractor to have a copy of an approved set of plans on the construction site at all times.

9. Temporary erosion control/water pollution measures shall be required in accordance with Section 1-07.15 of the *WSDOT Standard Specifications for Road, Bridge and Municipal Construction* and the *Stormwater Management and Site Development Manual for Gig Harbor*. At no time will silts and debris be allowed to drain into an existing or newly installed facility unless special provisions have been designed.

10. Electrical permits and inspections are required for all irrigation services within the City of Gig Harbor. The Contractor is responsible for obtaining all the required permits prior to any type of actual construction. Any materials purchased or labor performed prior to such approval shall be at the Contractor's own risk.

11. A clearly marked service disconnect shall be provided for every automatic irrigation installation unless otherwise stated on a City approved set of plans. The location and installation of the disconnect shall conform to the National Electrical Code (NEC) and City of Gig Harbor Public Works Standards. The service disconnect shall be Labor and Industries approved.

12. All low voltage wire shall be a minimum size of #14 UF from each control valve to the terminal interface.

13. All low voltage splices shall be of a type equal to a 3-M-BY-054007-09053 or a Labor and Industries approved equal. All splices shall be done in valve control boxes. Direct burial splicing will not be allowed.

14. The automatic controller components shall be approved by the City.

15. The City will be given 72 hours' notice prior to scheduling a shutdown. Where connections require "field verification", connection points will be exposed by the Contractor and the fittings verified 48 hours prior to distributing shut-down notices.

16. All irrigation main line and lateral lines shall be sch. 40 PVC piping or better.

    A. Layout of Irrigation System

       The Contractor shall stake all irrigation heads and mark all proposed trenches within the irrigation system per the approved plans prior to installing the system. Alterations in layout may be expected, i.e., to conform to ground conditions and to obtain full and adequate coverage to the landscaping. However, no alterations shall be made without prior authorization by the City.

    B. Excavation

All soil shall be prepared as specified in 2B.125 prior to trenching. Trenches shall be no wider at any point than is necessary to lay pipe or install equipment. Trench bottoms shall be relatively smooth and of sand or other suitable material free from rocks, stones, or other material which could damage the pipe. Trenches in rock or similar characteristic ground shall be excavated to 4 in. below the required depth and shall be backfilled to the required depth with sand or other City approved material.

Detectable marking tape shall be placed in the trench 4 in. directly above, parallel to, and along the entire length of all non-metallic water line and non-metallic conduit. The width and depth of the tape shall be as recommended by the manufacturer or the City. Locate wire shall be placed with all nonmetallic water lines. Locate wire will terminate in all control valve boxes and shall be placed in ditch before water lines are backfilled.

C. Piping

The irrigation main line is the line containing the supply usually situated between the irrigation meter and the irrigation control valves. The irrigation lateral lines are the lines between the irrigation control valves and the connections to the irrigation heads. Swing joints, thick walled poly pipe, flexible risers, rigid pipe risers, and associated fittings are not considered part of the lateral line but incidental components of the irrigation heads. All PVC pipe used for irrigation main line or irrigation lateral lines shall be schedule 40 or better.

All water lines shall be a minimum of 18 in. below finished grade as measured from the top of the pipe. Where possible, mains and laterals or section piping shall be placed in the same trench.

If water lines are to be installed under existing pavement, the main shall be installed within a minimum 4-in. diameter conduit. All non-metallic water lines to be installed under areas to be paved shall be placed within a minimum 4-in. diameter conduit. The irrigation conduit shall extend a minimum of 1 foot beyond the structure under which conduit is being jacked or bored.

D. Pipe Connections

During construction, pipe ends shall be plugged or capped to prevent entry of dirt, rocks, or other debris.

PVC pipe, couplings and fittings shall be handled and installed with care and in accordance with the manufacturer’s recommendation. The outside of the PVC pipe shall be chamfered to a minimum of 1/14 in. at approximately 22 degrees. Pipe and fittings shall be joined by solvent welding. Solvents used must penetrate the surface of both pipe and fittings which will result in complete fusion at the joint. The solvent and cement shall be of a type recommended by the pipe manufacturer.

Threaded PVC joints shall be assembled using Teflon tape as recommended by the pipe manufacturer.

On plastic-to-metal connections, work the metal connection first. Use a non-hardening compound on threaded connections. Connections between metal and plastic are to be threaded utilizing female threaded PVC adapters with a threaded schedule 80 PVC nipple only.

E. Electrical Wire Installation

The electrical controller shall be located in an open space or in a utility easement whenever possible.

Wiring between the automatic controller and the automatic valves shall be placed inside a 3/4 in. irrigation conduit, #14 wire and may share a common neutral. A spare #14 UF yellow wire shall be installed from the controller to the furthest valve in each direction, looping through each control valve box. There shall be a 2-foot loop left in each control valve box. Separate control conductors shall be run from the automatic controller to each valve. When more than one automatic controller is required, a separate common neutral shall be provided for each controller and the automatic valve which it controls. Wire shall be installed adjacent to the irrigation pipe. Plastic tape or nylon ty-wraps shall be used to bundle wires together at 10-foot intervals. Detectable marking tape shall be placed over the top of the irrigation conduit.

Wiring placed under pavement and walls or through walls, shall be placed in irrigation conduit. This conduit shall be PVC class 200 and shall not be less than 4 in. in diameter.

Splices will be permitted only at junction boxes, valve boxes, or at control equipment. A minimum of 2-feet of excess conductor wire shall be left at all splices and terminal and control valves to facilitate inspection and future splicing.

F. Material Specifications

As a means of keeping our parts inventory to a minimum and our maintenance personnel familiarized and knowledgeable about product operation, the following is a list of approved products to be used on all jobs in which the City will be responsible for maintenance and operations. Requests for approved equals need to be submitted to the City for review.

Figure 4-5 Material Specifications

Description	Approved Device
Pop Up Spray Heads	Rainbird or Hunter products • minimum of 4" pop up • check valves on all heads • pressure regulated spray on pressure over 40 psi • installed on Toro or Rain Bird Funny Pipe
Gear Driven Rotary Heads	Rain Bird or Hunter • installed on Funny Pipe or swing joints • check valves on all heads
Remote Control Valve	Rain Bird or Hunter products
Quick Coupling Valves	West Ag 4V100-R-Y • Rainbird 44RC
Double Check Backflow Preventer	• Wilkins 950XLT installed with schedule 80 PVC, or brass union • Back flow preventors must be tested and passed prior to setting of irrigation meter
Flow Sensing Device	Data Industrial IR series • installed with master control valve
Automatic Controller	• Rain Bird or Hunter with VRA low profile antenna, install with Data Retrieval Board • installed in vandal resistant pedestal
Valve Boxes	• Carson 910-12B for Quick Coupler • Carson 1419B for remote control valve
Shut-Off Valves	Wilkins 215 ball valve
Pressure Reducing Valve	Wilkins 600l or approved equal • Required if water static pressure exceeds 75 psi

G. Flushing

All main supply lines shall receive two fully open flushings to remove debris that may have entered the line during construction. The first flushing shall be completed prior to installing valves or testing.

All lateral lines shall receive one full-open flushing prior to placement of sprinkler heads, emitters, and drain valves. Note, drain valves on main lines are not recommended. It is the City of Gig Harbor's preference to have quick couplers installed on the downstream side at the cross connection device and at each terminus of the main line from the cross connection device. The flushing shall be of sufficient duration to remove any dirt and debris that have entered the lateral lines during construction.

H. Testing

All gauges used for testing water pressure shall be certified correct by an independent testing laboratory immediately prior to use on the project. Gauges shall be retested when ordered by the Inspector.

Automatic controllers shall be tested by actual operation for a period of two weeks under normal operating conditions. Should adjustments be required, the Contractor shall do so according to the manufacturer's recommendation or under the City's direction until the operation is satisfactory to the City.

All main lines shall be purged of air and tested with a minimum static water pressure of 150 psi for 40 minutes without introduction of additional service or pumping pressure. Testing shall be done with one pressure gauge installed on the line in a location determined by the City Inspector. Lines which show loss of pressure exceeding 5 psi after 40 minutes will be rejected.

All lateral lines shall be purged of air and tested in place at operating line pressure with a pressure gauge and with all fittings capped or plugged. The operating line pressure shall be maintained for 30 minutes with valves closed and without introduction of additional pressure. Lines which show leaks of loss of pressure exceeding 5 psi at the end of specified test period will be rejected.

The Contractor shall correct rejected installations and retest for leaks as specified herein.

I. Backfill

Backfill shall not be started until all piping has been inspected, tested and approved by the City Inspector, after which, backfilling shall be completed as soon as possible. All backfill material placed within 4 in. of the pipe shall be free of rocks, roots, or other objectionable material which might cut or otherwise damage the pipe.

Backfill from the bottom of the trench to approximately 4 in. above the pipe shall be by continuous compacting in a manner that will not damage pipe or wiring and shall proceed evenly on both sides of the pipe. The remainder of the backfill shall be thoroughly compacted, except that heavy equipment shall not be used within 18 in. of any pipe. The top 4 in. of the backfill shall be of topsoil material.

J. Adjusting System

Before final inspection, the Contractor shall adjust and balance all sprinklers to provide adequate and uniform coverage. Spray patterns shall be balanced by adjusting individual sprinkler heads with the adjustment screws or replacing nozzles to produce a uniform pattern.

K. System Operation

The irrigation system shall be completely installed, tested and operable prior to planting unless otherwise specified in the plans or as approved by the City. The Contractor shall be responsible for all maintenance, repair, testing, inspecting and automatic operation of the system until all work is considered complete as determined by the final inspection. Developer is responsible for all water service connection and meter installation charges associated with irrigation water meter.

L. Record Drawings

Upon final acceptance of the work, the Contractor shall submit two record drawings per Section 1.065.

4.190 Inspection of Work

In no event shall the work or any portion thereof, be covered up until the Construction Inspector has completed inspection and approved the same. If any work should be covered up without prior inspection and approval by the Construction Inspector, it must, if required by the City Engineer, be uncovered for examination at the developer/contractor's expense. The Construction Inspector shall at all times have access to the work wherever it is in preparation of progress and the developer/contractor shall provide facilities for such access and for such inspection.

If the specifications, laws, ordinances, or any public authority shall require any work to be specially tested or approved, the Construction Inspector shall be given timely notice of its readiness for inspection and, if the inspection is by other authority than the City, the date fixed for such inspection.

All inspections by the Construction Inspector will be made with all reasonable promptness, but in no event shall the lack of prompt inspections be construed to allow the cover up of the work or any portion of it without inspection.

Re-examination of questioned work may be ordered by the City Engineer and, if so ordered, the work must be uncovered by the developer/contractor.

LIST OF DETAILS
CHAPTER 4 WATER