



Water & Wastewater System Extensions

DESIGN REQUIREMENTS



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SECTION I GENERAL

1. PURPOSE

The purpose of these Design Requirements is to provide engineers, designers, inspectors and others a reference to City of Redmond's requirements for the design and installation of improvements to the water and sewer systems. **No extension or modifications to the City's water and sewer system shall be made without approved construction drawings, prepared in accordance with these standards and approved permit(s).**

The design standards included herein are intended to result in utility systems which will:

- a) Provide the needed source, storage and distribution facilities to maintain established levels of service during periods of maximum use.
- b) Provide the needed sewer facilities to carry all anticipated sewage flows within a basin.
- c) Conform to the City's Water System Plan and General Sewer Plan.
- d) Be of material strong enough to resist all expected loads, both internal and external, in order to preserve the purity and potability of the water supply and protect ground and surface waters from the escape of wastewater.
- e) Be safe and economical to maintain.

Alternate materials and methods may be considered for approval on the basis of these objectives and conformance to all requirements indicated elsewhere in these standards.

2. REVISIONS TO THESE REQUIREMENTS

It is anticipated that revisions to these requirements may be made from time to time. The date appearing on the title page is the date of latest revision. Users should utilize the most current City-approved edition to these requirements. This edition was approved in March 2019. Contact the Development Services Division at (425) 556-2876 or visit the City's website at www.redmond.gov to ensure this is the most current edition.

3. REFERENCED STANDARDS

- a) Reference herein is made to the latest edition of standards, tests, methods, and specifications of research as follows:
- b) AWWA Standards, prepared by the American Water Works Association (AWWA).
- c) American National Standards, prepared by the American National Standards Institute (ANSI).
- d) Standard Specifications, prepared by the American Society for Testing and Materials (ASTM).
- e) Fire Flow Determination, Redmond Fire Department Standards.
- f) Standard Specifications for Road, Bridge, and Municipal Construction, prepared by Washington State Department of Transportation and the Washington State Chapter, American Public Works Association (APWA), latest edition, as modified by City of Redmond Standard Specifications and Details.
- g) Group A Public Water Supplies—Chapter 246-290 Washington Administrative Code.
- h) City of Redmond Standards, Specifications and Details, prepared by the City of Redmond, latest edition.
- i) Criteria for Sewage Works Design prepared by the Washington State Department of Ecology, latest edition.
- j) Cross Connection Control Manual, Accepted Procedures and Practice, prepared by the, Pacific Northwest Section American Water Works Association, latest edition.
- k) Uniform Plumbing Code (UPC) prepared by International Association of Plumbing and Mechanical Officials, latest edition.

4. REFERENCED UTILITY PLANS

- a) Redmond Water System Plan (latest edition)
- b) Redmond General Sewer Plan (latest edition)

SECTION II UTILITY DRAWING FORMAT AND CONTENT

For Private Development projects, an abbreviated form for the items in this section is included in the Coordinated Civil Review (CCR) checklist. Please follow the latest edition of the CCR checklist if there is a discrepancy between the two documents.

1. **Material and Size**

Plans are to be prepared in electronic format. The following formats are acceptable: MicroStation (*.dgn); AutoCAD (*.dwg), and other CAD programs (*.dwg). Final construction drawings for extensions of the water and sewer system shall be 22" x 34" Mylar originals. Vellum, paper, sepia reproductions, or photographic reproductions are not acceptable

2. **Drawing Content**

Drawings for water and sewer shall contain complete and comprehensive information necessary to review the design and to construct the improvements. Show all relevant topographic survey data and information from other project drawings such as, existing and proposed grading, storm drainage, street and surface improvements, other utilities, landscape drawings, potholing data etc., on the water and sewer drawings. Provide alignments with all water mains and sanitary sewer, and use the alignment in the profile grid.

3. **Title Block/Drawing Title**

In the drawing title block please include the name, address and phone number of the project developer and project engineer. In addition to the engineer's standard title block on the bottom or right side of drawing, include a drawing title generally centered on the top of the sheet containing the project name, section, township, and range, the number of lots or units in the project, the water system pressure zone and the Metro connection manhole.

4. **Vicinity Map**

Include a vicinity map showing the general location of the project on the first sheet of the water/sewer drawings, if not provided elsewhere in the plan package.

5. **Approval Block**

Include the standard city approval block located in the lower right-hand corner on each sheet of the drawing set.

6. **Drawing Scale**

Horizontal scale shall be 1" = 20'. Vertical scale shall be 1" = 5'.

7. **Datum**
City of Redmond elevations are based on the NAVD 88 datum. Provide a minimum of two (2) City of Redmond benchmarks on the first sheet of the water/sewer drawings that the survey is tied to. Sewer inverts shall not be used as benchmarks.
8. **North Arrow/Bar Scale**
Include a north arrow and bar scale placed in the same location on each drawing with north oriented to the top or left of each drawing.
9. **Drawing Layout**
Lay out drawings to present the design in a clear and logical manner. It is advisable to discuss plan layout prior to preparation of a large project with the Development Services Division to provide input on the initial layout. Provide match lines and cross references at all appropriate locations.
10. **Profiles**
Profiles are required for both water and sanitary sewer. Locate profiles on plan sheets oriented directly above or below the plan view.
11. **Profile Information**
Indicate finished grade above the utility and accurately depict utility crossings showing the clearance. Show physical characteristics of the utilities true- to- scale including waterline deflection, pipe diameter, pipe slope, manhole depths, and other pertinent information. Show all existing and proposed utility crossings in profile, provide pothole information for existing utilities crossing the proposed water and sewer lines unless asbuilt survey can be provided to verify the elevations do not conflict and/or are deemed unnecessary by the City. Use alignment stationing on the profile grid.
12. **Plan View Information**
Indicate and identify all existing and proposed buildings, structures, utility systems (water, sewer, storm, power, phone, gas, cable TV, fiber optics, duct banks, etc.), street improvements and paving, stream crossings, mailboxes, light poles and other known physical features within the project area which will affect the design and construction of the water and sewer improvements. Identify all utilities to be abandoned within and adjacent to the project area and provide information on the abandonment procedure. If an existing utility line is greater than 12-inches in diameter, show the utility with its actual width on the drawing. Pothole information for existing utilities within close proximity of the proposed water and sewer lines may be required, at the discretion of the City, unless record drawing survey can be provided to verify the elevations do not conflict and/or are deemed unnecessary by the City.
13. **Professional Engineer / Licensed Fire Sprinkler Designer Stamp**
Construction drawings for all piping and appurtenances that will become the property of the City of Redmond are to be prepared, signed and stamped by a civil engineer with current registration in the State of Washington prior to submittal and

review by the City. Private fire sprinkler designs are to be signed and stamped by a Fire Sprinkler Designer with current State of Washington license.

14. **Legend**

Include a legend of symbols used to show clarity.

15. **Property Data**

Include all property lines, with dimensions and bearings, ownership lines, street right-of-way lines, lot numbers, block numbers, plat names, and street names.

16. **Stationing / Coordinates**

Include both centerline stationing and offsets and state plane coordinates using NAD 83-91 survey control for all mains and appurtenances.

17. **Phased Project Drawings**

Phased projects require drawings which depict all construction necessary to complete each phase independently.

18. **Multi-Family Projects**

Include building numbers and number of units per building on multi-family projects construction drawings.

SECTION III ADMINISTRATIVE REQUIREMENTS (private development only)

Before completion of the project and prior to issuance of any water and sewer permits, there are several administrative requirements relative to the public water and wastewater systems. For additional details pertaining to administrative requirements contact the Development Engineering Division at (425)556-2840.

Administrative requirements include, but are not limited to, the following items:

1. Bill of Sale
2. Asset Summary
3. Easements
4. Temporary Maintenance Agreement
5. Abandon Plant table
6. Maintenance Guarantee
7. Performance Guarantee
8. Reimbursement Agreements
Portions of a system extension, either potable water or sanitary sewer, may benefit other properties and meet the criteria to be eligible for a reimbursement agreement. In order to be eligible for reimbursement, the City must receive a completed reimbursement agreement application prior to approval of construction drawings and the agreement must be fully executed by the City prior to commencement of construction of the facility. Any approved reimbursement fees associated with a parcel must be paid prior to sale of water or side sewer permits and or prior to plat/short plat recording. (RMC 13.12).
9. Record Drawings
Refer to Development Services Record Drawing Process, CIP Record Drawing Process, and City of Redmond Record Drawing Requirements (latest edition) for complete information on the submittal and review processes.

SECTION IV WATER MAIN DESIGN REQUIREMENTS

1. GENERAL

The system will be designed to have sufficient capacity to minimize pressure variations, provide minimum residual pressure of 40 psi at each meter during periods of maximum use, and provide sufficient volumes of water at adequate pressure to satisfy the expected maximum instantaneous demand plus fire flow.

In general, water system extensions are to be designed to incorporate the recommendations of the latest edition of the Water System Plan for the City of Redmond.

2. CAPACITY AND SIZING REQUIREMENTS

a. Design capacities and main sizing shall be determined by considering of the following factors:

- 1) The proposed development and adjacent areas.
- 2) Current and projected populations within the areas to be served.
- 3) Current and projected land use within the areas to be served.
- 4) Commercial, multi-family, industrial, or institutional users to be served.
- 5) Changes in any of the above factors which are likely to occur within a foreseeable time period.

b. In the absence of project specific data, refer to the latest edition of the City's Water System Plan for water demand information. In addition, use the following fire flow requirements for projects:

- 1) Fire flow of **1,500 gpm at 20 psi** residual pressure in residential areas.
- 2) Fire flow of **3,500 gpm at 20 psi** residual pressure in multi-family, commercial and industrial areas.
- 3) The maximum velocity in a pipe will be 10 fps. (For example, if more than one fire hydrant is required within the water line extension then a 12-inch diameter pipe must be used.)

c. Main Sizes (diameter)

- 1) 2" - not to be used as part of the distribution system.
- 2) 3" - not to be used as part of the distribution system.
- 3) 4" - not to be used as part of the distribution system except at the end of cul-de-sac mains after the last fire hydrant.
- 4) 6" - not to be used as part of the distribution system except as fire hydrant runs.
- 5) 8" - minimum size for permanently dead-ended mains supplying fire hydrants, for local distribution mains in residential areas, and for minor transmission mains.
- 6) 10" - not to be used as part of the distribution system.
- 7) 12" or Larger - as required for transmission (feeder) mains. 12-inch diameter is the minimum size required in commercial, industrial, and multi-family housing.

3. WATER MAIN LOCATIONS

a. **General**

The standard (preferred) location for a water main is within the roadway rights-of-way of public streets. Water mains can be installed within a 20 foot wide City of Redmond water main easement across privately owned property, when necessary, and only if approved by the City. When located in easement areas, water mains shall be located within the paved drive lanes of access corridors. Water mains in non-paved areas may be allowed only on a case-by-case basis. Properties that are redeveloping or undergoing additional development shall be required to meet current location standards. This may include the abandonment of existing mains and installation of new mains, in accordance with current standards.

b. **Streets**

Standard locations for water mains within public streets, private streets, road tracts, or parking areas are on the north and east sides of the centerlines. To the greatest extent possible, locate water mains 10 feet from centerline when the pavement section is 36 feet in width or greater. Place water mains 8 feet from the curb face if the pavement width is narrower than 36 feet. The location of the water main within right-of-way or private

streets shall minimize the placement of utility covers within wheel tracks of vehicles. Alternate locations to this requirement may be made in order to minimize the cutting and replacing of pavement, to avoid conflicts with replacing of pavement, to avoid conflicts with other underground facilities, to permit sanitary sewers to be installed on the "low side" of streets, or for other circumstances with the approval by the City.

c. **Variations**

As nearly as practical, mains are to be installed on a particular street with the distance from the property line and/or centerline varied as little as possible.

d. **Horizontal Clearance – Utilities, Excluding Sewer**

The minimum standard horizontal clearance between water mains and stormwater pipes, gas mains, fire sprinkler mains, power, phone and other underground utility facilities (including vaults, duct banks, etc.), shall be 5 feet. (Clearance is defined as being measured from the outside wall of pipe for 12-inch diameter or larger pipe and centerline for smaller than 12-inch pipe.)

e. **Horizontal Clearance - Sewer**

Water mains shall be installed a minimum horizontal distance of 10 feet from sanitary sewer mains, or in accordance with the design requirements and regulations adopted by the Washington State Department of Ecology, regarding water main/sanitary sewer horizontal separation.

f. **Vertical Clearance – Utilities, Excluding Sewer**

The standard vertical clearance between walls of water main pipelines and stormwater pipe and pipelines/cables/conduits of other utility facilities, except sanitary sewers, is 12-inches. Utility duct banks encased in concrete, power and signal vaults, other franchise utilities/pipelines/cables/conduits, and concrete-formed pads for utility-related equipment such as power and signal cabinets or light pole bases shall be placed under water mains or appurtenances. Where 12-inch vertical separation cannot be achieved, special construction techniques to protect each utility are required. Use of Dow Plastics Ethafoam 220 pad between the utilities is acceptable with a minimum of 6-inch vertical separation is required. (Refer to City of Redmond Standard Specifications 7-04.3(2) for product information.)

g. **Vertical Clearance - Sewer**

Locate water mains over sanitary sewers, providing a minimum of 18 inches of vertical clearance between the walls of these pipelines or in accordance with the design requirements and regulations adopted by the Washington State Department of Ecology, regarding water main/sanitary sewer vertical clearance, shall be followed.

- h. **Vertical Clearance – Electrical Wires**
Where overhanging electrical wires cross a water utility easement, a minimum above ground vertical clearance shall be provided and maintained in accordance with the Utility Provider vertical clearance requirements.
- i. **Crossing Angles - Utilities**
Water mains are to cross other pipelines/cables/conduits/stormwater pipe at right angles (90 degrees). Other pipelines/cables/conduits/stormwater pipe are to cross water mains at right angles (90 degrees).
- j. **Depth of Cover**
The standard cover over 8-inch diameter and smaller water mains shall be 36 inches and 48 inches for 12-inch diameter and larger pipe. 60 inches is the maximum cover allowed over water mains where conflicts with other utilities require the water main to be deeper.
- k. **Easement Widths**
Public water main easements shall be 20 feet in width, 10 feet each side of the centerline of the pipe. Show easements on construction drawings and identify the easement widths. Easements around fire hydrants, water meter boxes and other water appurtenances shall be 10 feet in all directions. Building overhangs, underground garages, elevated and other permanent structures shall not extend over or under the easement areas. In areas of the City where a 2 foot building modulation is allowed, easement widths may be decreased to 5 feet, measured from the outside of the meter vault.
- l. **Looping**
Looping ensures a well-gridded water system that provides redundancy and reliability of service for new and existing customers. Water mains shall be looped where required by the City.
- m. **Potholing**
To minimize conflicts in the field, all existing utilities at the location of the proposed water main and service line crossings shall be potholed prior to approval of site plan entitlement. The City shall determine the extent of potholing for design of facilities where clearance requirements are deemed critical. Potholing in City right-of-way requires a permit, approved traffic control plans, and a performance bond before commencing work.

4. VALVE REQUIREMENTS

- a. **Valve Type**
Valves 2” through 12” shall be resilient seat/wedge gate valves. Valves larger than 12” shall be butterfly valves. All valves shall meet the requirements of the latest edition of the City of Redmond Standard

Specifications and Details. On construction drawings, show butterfly valve operating nuts located on the right side of the tee or cross as you approach the center from any direction.

b. **Valve Size**

Valve size shall be the same as the main in which installed.

c. **Valve Locations**

Distribution system valves are to be located as an assembly on **all** branches of a tee or cross. The spacing of valves shall be such that the length of any one (1) shut-down in commercial, industrial and multi-family areas does not exceed 800 feet, and in other areas 1,200 feet. The spacing of valves is to be such that no more than two (2) fire hydrants are removed from service with any separate main shutdown.

d. **Air Valves**

Combination air release and vacuum valves shall be installed on all high points of water mains. Locate the box, which contains the valve and the standpipe, outside the traveled way in a landscape area, preferably behind the curb and sidewalk at property line intersections but within the public right-of-way or waterline easement. In urban streetscapes where landscape areas are not available, install air valves within the furnishing zones of sidewalks. Air release and vacuum valve assemblies are to be installed in accordance with the latest edition of the City of Redmond Standard Specifications and Details.

e. **Blowoffs**

Terminate dead-end mains with a blowoff assembly or fire hydrant. All low points of a main shall have a blowoff assembly or fire hydrant. Locate blow-off assemblies outside the traveled way, behind the curb and sidewalk, either within public right-of-way or water line easement. Blowoff assemblies on pipe 12-inch diameter and larger shall be a fire hydrant. Fire hydrant blowoffs at the termination of dead-end mains to be extended in the future shall be painted blue. Fire hydrant blowoffs at low points shall be painted yellow. (Refer to paint specifications listed in the City's Standard Specifications.)

5. **BACKFLOW PREVENTION**

- a. Locations and size of backflow prevention devices (aka backflow preventers) shall be shown on the construction drawings. Backflow preventers shall be installed in accordance with the latest editions of the American Water Works Association (AWWA) Cross Connection Control Manual and the Uniform Plumbing Code (UPC). If the backflow preventer is to be installed within a vault it shall be located on the exterior of the

building. A detailed design shall be included with the construction drawings delineating the vault layout, piping configuration, gravity drain and appurtenances. For backflow preventers within a building, the construction drawings should call out the location of the device in the building. Contact the Cross Connection Control Program at (425)556-2817 for questions regarding backflow prevention.

6. FIRE FLOW/HYDRAULIC ANALYSIS

- a. The required level of service for fire flow is 1,500 gpm for standard single-family residential areas of the City and 3,500 gpm in commercial, industrial and multi-family housing areas. A hydraulic analysis to determine fire flow to a specific property may be requested by contacting the Environmental and Utility Services Division via email to genpw@redmond.gov or via phone at (425)556-2701.

7. FIRE HYDRANT REQUIREMENTS

- a. The location of fire hydrants will be determined on a project by project basis in accordance with the Redmond Fire Marshal requirements. The following criteria provides general guidance, but the specific determination of the Fire Marshal shall govern:
 - 1) Maximum hydrant spacing in single-family residential plats is 600 feet with the hydrants preferably located at intersections and within 350 feet to the center of any building lot (including flag lots). Where structures on a dead-end access are over 300 feet from a hydrant, an additional hydrant may be required to be placed within 300 feet and placed in relation to the overall development and existing hydrant layout.
 - 2) Maximum hydrant spacing in commercial, industrial and multi-family residential developments is 300 feet and with no more than 150 feet traveled distance to any portion of the exterior wall of any structure.
- b. The City of Redmond Fire Department and the Public Works Department jointly approve fire hydrant locations. Fire hydrants shall have a minimum setback from curb face as shown on the City of Redmond Standard Details. The easement area around the fire hydrant is 10 feet in all directions.
- c. The minimum waterline size from the main to the hydrant is 6-inches in diameter if the length of the line is less than or equal to 50 feet. If the length exceeds 50 feet, the minimum line size shall be 8 inches in diameter.

- d. Existing fire hydrants that are to be relocated shall not be reused in the water system and shall be physically replaced with a new fire hydrant and any necessary components of the hydrant assembly.

8. SERVICE CONNECTIONS

- a. **New Water Service Connections**

Water service connections including service saddle, service line, meter setter, meter box and appurtenances are to be installed as part of the construction of new water main extensions and shall be installed at the locations shown on the approved construction drawings.

Water service connections for meters 2-inches and smaller shall utilize corporation stop connections. Meters larger than 2-inches, shall install a tee and gate valve for connection to the main.

- b. **Existing Water Service Connection Abandonment**

Existing water service connections, 2 inches or smaller, that are not to be used shall be physically removed from the water main. Remove the saddle, corporation stop, service line, meter setter and box. A 12" wide stainless steel repair band shall be installed on the water main.

Existing water service connections, larger than 2-inches, that are not to be used shall be physically removed by blind flanging the tee and removing the gate valve, service line, vault, and drain line.

Additional requirements, depending on the existing and future conditions may be imposed based on specific circumstances. An example of the additional requirements for abandonment could be to remove the entire water service, including the tee or corporation stop, and replace it with a section of straight pipe with couplers on each end.

9. METERS

- a. **Standard Sizes**

The typical sizes of meters which may be used are $\frac{5}{8}$ " x $\frac{3}{4}$ ", 1", 1-1/2" and 2". The use of larger meter sizes requires specific approval by the City. Larger meter sizes require the use of concrete vaults. Refer to Standard Details for specific vault sizes and specific requirements. When showing larger sized meters on construction drawings, use actual vault sizes.

- b. **Meter Locations - General**
Locate meter boxes or meter vaults within a landscape area. In a designated urban streetscape (such as Downtown, Overlake, and Marymoor) where landscape areas may not be available, meter boxes or vaults are permitted in hard surface areas, such as concrete. In those instances, special traffic bearing boxes/vaults equipped with non-skid lids are required.
- Meters shall not be located in areas where special access is required (i.e. behind gated access, padlocked fences, etc.) or under any form of overhang such as an awning or 2nd floor of building structures.
- c. **Multiple Meter Assemblies**
For adjacent residential lots/parcels install multiple service connections in as many situations as possible. The proposed meter layouts shall be shown on the approved construction drawings. Private water service lines from the meters to the houses shall be placed outside of City right-of-way and shall be shown on the construction drawings.
- d. **Meter Location - Residential**
Locate meters in front of the lot/parcel to be served in a landscape (soft) area. All materials comprising the service connection shall be located within the public street right-of-way or public water line easement, whichever is applicable, with the front edge of the meter box being adjacent to the back of curb or sidewalk. Meter boxes shall be located to allow ease in the periodic reading of the meter and shall be placed as close to the property line as possible. Meter boxes shall not be placed within a sidewalk, driveway or other hard surface areas without prior approval by the Review Engineer. In those instances, special traffic bearing boxes/vaults with non-skid lids are required. For meter boxes located adjacent to driveway edges, maintain a minimum separation of 18” to the nearest box edge to prevent the meters from being driven over by vehicles.
- e. **Meter Location - Commercial/Multi-Family**
In commercial and multi-family developments locate meter boxes or vaults in a landscape (soft) area behind the back of curb or sidewalk of a vehicle travel aisle and not behind parking spaces or other obstructions. Meters should be located to allow ease in the periodic reading of the meter. Meter boxes/vaults shall not be placed within a sidewalk, driveway or other hard surface areas without prior approval by the Review Engineer. In a designated urban streetscape (Downtown and Overlake) where landscape areas are not available, meter boxes or vaults are permitted in hard surface areas, such as concrete. In those instances, special traffic bearing boxes/vaults with non-skid lids are required.

- f. **Exempt Meters**
Exempt meters installed downstream of a city-owned meter are allowable and can be used for irrigation, cooling towers, and certain commercial applications when approved by the Review Engineer. Exempt meters are privately owned, maintained, and repaired by the property owner and shall be accessible to the City for periodic reading. Meters to be installed shall be purchased from the City. Meters, service lines, meter setters, and boxes to be used are the same as specified for City use. For cooling tower installations, a radio MXU is to be installed on the outside of the building located in the area near the domestic meter. Wiring and other items to accommodate periodic reading/reporting are the responsibility of the property owner.

- g. **Installation of Water Meters**
Water meters 2-inches and smaller shall be installed by the City upon application, payment of fees required by other city codes and resolutions, and completion of all administrative requirements. Meters 3-inches and larger are installed by the developer and locked off until payment of fees and completion of administrative requirements have been accomplished.

10. CONNECTIONS TO EXISTING WATER MAINS

In general, connections of proposed water mains to existing water mains shall be made by cut-in type procedures. Connections to the existing systems are also made by tapping the existing water main while under pressure and still in service. Both types of connections are subject to City approval. Cut-in tees and crosses are required to provide for suitable valving at the assembly and the City's water system. Cut-in tees or crosses require valves to be installed on each branch. Use of ductile iron (DI) spools (10 ft. min.) and couplers to connect to the existing pipe are required. Tapping tees may be considered where adequate existing main line valving is available and where deemed appropriate by the City.

For connection to asbestos cement (AC) water mains, cut-in connections and valves, DI spools (10 ft. min.), and couplers are required.

11. MISCELLANEOUS

- a. **Pipe Callouts**
Show pipe size in the plan and profile views. Provide dimensional information to locate all appurtenances needs to be shown (for construction and for later maintenance).

- b. **Valve at Connection**
Install a new valve at the end of an existing main which is to be extended in order to facilitate disinfection and testing of the new main.
- c. **Valve Callouts**
Delineate the type and size of valves to be used.
- d. **Meter Callouts**
Show the location, service line size, size and type of meter for all meters. This includes domestic, irrigation and backflow, and dual purpose meters.
- e. **Fitting Callouts**
All fittings including tees, crosses, bends, sleeves, etc., are to be shown in plan and profile. Identify the joint connections of each fitting in plan view with the appropriate dimensional information. Generally, all valves to fitting connections shall be flanged and fitting to pipe connections shall be mechanical joint.

In situations where multiple fittings are to be used, fittings are not to be bolted together. Space fittings a minimum of 5 feet apart. If a pipe joint must be installed between fittings, restrain the joint.

A push-on pipe joint is not permitted within 5 feet of a fitting.

- f. **Restrained Joints**
Restrained jointing systems are required in areas of unsuitable soils, areas of fill placement, complex thrust conditions, fire hydrant lines, fire protection systems or other locations where deemed necessary by the City.
- g. **Vertical Bends**
Vertical bends are not allowed in the water system unless approved by the Review Engineer.
- h. **Poly Wrap**
Poly wrap may be required for pipes in areas where soil corrosion is a problem. Poly wrap will be required for all fittings placed in control density fill (CDF). (Minimum of 1 foot of gravel shall be provided around poly wrap prior to CDF).
- i. **Individual PRVs**
If the area has a high static pressure (over 80 psi), the plans must indicate the need for individual pressure reducing valves.
- j. **Trees**
Trees shall be located a minimum 8 feet horizontally from City-owned water mains, service lines, meter boxes, fire hydrants, and other water

appurtenances. For large meter vaults, separation is measured to nearest edge of vault.

k. **Unstable Soils**

Remove unsuitable and unstable soil, such as peat, from under pipes. Applicant shall provide a geotechnical report for review in conjunction with the construction plans when requested by the City. The geotechnical report shall include recommendations for special requirements that are to be included on the construction drawings necessary for installation of utilities in accordance with City of Redmond specifications. .

l. **A.C. Pipe**

Existing A.C. pipe shall be required to be removed and replaced with ductile iron when crossed under or over by other utilities or where grading or other construction activities may subject the pipe to damage or loss of support. The pipe replacement shall be a minimum of 10 feet each side of any utility crossing. Where multiple A.C. pipe sections are being replaced due to utility crossings and/or construction activities, the City may require additional sections of pipe to be replaced to minimize creating an area prone to failure. The approved construction drawings shall delineate the replacement area. However, actual field conditions may require additional pipe to be replaced at the City's discretion.

Removal and replacement of A.C. pipe with ductile iron pipe shall also be required when the minimum pipe size requirement for the type of development necessitates the upsizing of the pipe.

Cutting and tapping of an A.C. main requires the operator to have asbestos cement work practices and procedures certification. Disposal of the removed A.C. pipe is required and shall be in accordance with the Puget Sound Clean Air Agency (PSCAA) requirements. A permit from PSCAA to perform the work is required prior to construction drawing approval. The contractor shall provide documentation of the permit and the verification of the proper disposal to the City prior to project acceptance.

m. **Building Footings**

Locate public water mains at least 10 feet from structures or footings. Building footings are to be located/designed such that the footing will not bear on the pipe. In general, locate footings below the soil failure plane defined by a 1:1 slope extended up from a point 2 feet horizontal from the pipe invert (ie - the bottom edge of the utility trench nearest the footing) to ground surface.

n. **Rockerries/Retaining Walls**

Rockerries or retaining walls shall not cross or be within easement areas for water mains or other water appurtenances. Crossings under a rockery or retaining wall shall require special construction techniques, including but

not limited to, installation of steel casings, casing spacers, restrained gaskets and end seals. The approved plans shall indicate the required casing thickness, casing spacer size, quantity and clearances, and specify other construction techniques such that no load is transferred to the pipe.

The foundation of rockeries or retaining walls parallel (or adjacent) to water mains shall be located such that no load shall bear on the pipe. The foundation shall be located below the soil failure plane defined by a 1:1 slope extended up from a point 2-feet horizontal from the pipe invert (ie - the bottom edge of the utility trench nearest the foundation) to ground surface. Locate foundations outside of the utility easement.

- o. **Any water main and appurtenances that are removed during construction shall not be reused on any part of the water system.**

SECTION V SEWER MAIN DESIGN REQUIREMENTS

1. GENERAL

Design of sanitary sewers must, at a minimum, comply with the "Criteria for Sewage Works Design" as published by the State of Washington Department of Ecology. Any exceptions to the design requirements require separate approval.

In general, sewer system extensions are to be designed to incorporate the recommendations of the latest edition of the General Sewer Plan for the City of Redmond.

2. CAPACITY AND SIZING REQUIREMENTS

- a. Design capacities and main sizing will be determined for specific proposed developments by considering the following factors:
 - 1) The proposed development and adjacent areas.
 - 2) Current and projected population within the areas to be served.
 - 3) Current and projected land use within the areas to be served.
 - 4) Commercial, multiple-family, or institutional users to be served.
 - 5) Changes in any of the above factors which are likely to occur within a foreseeable time period.
- b. In the absence of project specific data, utilize the flows outlined in the latest edition of the General Sewer Plan for single family, multi-family, retail, industrial, Inflow and Infiltration (I/I), and peaking factors.
- c. These assumptions shall be used to design new extensions and evaluate existing systems. Submission of design calculations will not ordinarily be required except where portions of the system will need to be extended to serve additional areas or at the discretion of the City.
- d. The minimum size for an extension of a city sewer main is 8-inch diameter. Main sizes greater than 8-inch will be required when design flows will fill an 8-inch pipe at the design slope or when a larger pipe has been used upstream. Use of a larger pipe to meet minimum slopes is not allowed unless the increase in pipe size is necessary to support the anticipated flow.

- e. Sewer pipe material shall be in accordance with the City's Standard Specifications 7-17.2.

3. SEWER MAIN LOCATIONS

- a. **General**

The standard location for a sewer main is within the rights-of-way of public streets. Sewer mains shall be installed within a 20 foot wide City of Redmond sewer main easement across privately owned property, when necessary, and only if approved by the City. When located in easement areas, sewer mains will be located within the drive lanes of access corridors. Sewer mains in non-paved areas are not allowed but may be approved by the City on a case-by-case basis. Properties that are redeveloping or undergoing additional development shall be required to meet current location standards. This may include the abandonment of existing mains and installation of new mains, in accordance with current standards.

- b. **Streets**

Sewer mains within public streets, private streets, access tracts or parking areas shall be located such that manholes and pipe are south and west of centerline and 8 feet from curb face. In curved street sections, additional manholes shall be required.

- c. **Horizontal Clearance – Utilities, Excluding Water**

The standard horizontal clearance between sewer mains and stormwater pipes, gas mains, fire sprinkler mains, power, phone and other underground utility facilities, including vaults, is 5 feet. (Clearance is measured from the outside wall of pipe for 12-inch diameter or larger pipe and centerline for smaller than 12-inch pipe.)

- d. **Horizontal Clearance - Water**

Sewer mains shall be installed a minimum horizontal distance of 10 feet from water mains, or in accordance with the design requirements and regulations adopted by the Washington State Department of Ecology, regarding water main/sanitary sewer horizontal separation.

- e. **Vertical Clearance – Utilities, Excluding Water**

The standard vertical clearance between walls of sewer mains and stormwater pipe and pipelines/cables/conduits of other utility facilities, except water, is 12-inches. Utility duct banks encased in concrete, power and signal vaults and other franchise utilities/pipelines/cables/conduits, and concrete-formed pads for utility-related equipment such as power and signal cabinets or light pole bases shall be placed under sewer mains, wherever possible. Where 12-inch vertical separation cannot be achieved, special construction techniques to protect each utility are required. Use of Dow

Plastics Ethafoam 220 pad between the utilities is acceptable but a minimum of 6-inch vertical separation is required.

f. **Vertical Clearance - Water**

Locate sanitary sewer mains under water mains, providing a minimum of 18 inches of vertical clearance between the walls of these pipelines. Where this specified clearance cannot be met, the design requirements and regulations adopted by the Washington State Department of Ecology, regarding water main/sanitary sewer vertical clearance, shall be followed.

g. **Crossing Angles - Utilities**

Sewer mains are to cross other pipelines/cables/conduits/stormwater pipe as close to right angles (90 degrees) as possible. Other pipelines/cables/conduits/stormwater pipe are to cross sewer mains as close to right angles (90 degrees) as possible.

h. **Minimum Cover**

The preferred cover over sewer mains is 7 feet in order to ensure gravity service and provide normal vertical separation between water and sewer mains. The minimum cover over ductile iron sewer mains is 4 feet in both paved and unpaved areas; minimum cover over other sewer mains is 5 feet in both paved and unpaved areas. Ductile iron sewer mains shall be Class 52 DI with Protecto 401 or SewerSafe linings. Refer to Standard Specifications for additional information.

i. **Easement Widths**

Public sewer main easements shall be 20 feet in width, 10 feet each side of the centerline of the pipe. Show easements on the construction drawings and identify the easement widths. Building overhangs, elevated and other permanent structures are not allowed within the easement areas.

j. **Access Roads**

All manholes shall be accessible to the City maintenance vehicles. If not located in a vehicle access way, then access by an improved roadway surface must be provided. Access roads shall have a minimum paved width of 14 feet with a 2-foot gravel shoulder on each side.

For manholes that require maintenance by an eductor truck, the preferred configuration is to have the eductor truck approach a structure opening with the front of the vehicle with limited maneuvering required from the nearby street. Access requiring backing maneuvers require approval by the Review Engineer. Acceptable access includes an improved roadway surface within 10 feet of a manhole or vault opening with overhead clearance to 20 feet to allow for boom operation. Materials for construction of an improved roadway surface can include asphalt concrete or Portland cement concrete. Maintenance access roads shall comply with the current version of Redmond Standard Detail DG-11. Access roads

shall have a maximum slope of 15%, except at access points (such as manholes or vault openings). Access points shall be designed such that an eductor truck can perform maintenance operations while parked with a maximum slope of 10% parallel to the truck and 2% cross slope with the truck. Either through-access or a turnaround is required.

Design drawings shall demonstrate how the City's eductor trucks can access all areas that require maintenance. Details shall be provided to ensure full clearance of all parts of the vehicle when navigating changes in grade or turning.

k. **Potholing**

To minimize conflicts in the field, all existing utilities at the location of the proposed sewer main and side sewers shall be potholed prior to approval of site plan entitlement. The City shall determine the extent of potholing required on a case-by-case basis. A City of Redmond Right-of-Way permit, including approved traffic control plans, is required before potholing within right-of-way or City easements.

4. MANHOLE REQUIREMENTS

a. **Manhole Spacing**

Manholes are to be installed at a maximum of 350-foot spacing. Manholes are to be installed at the end of all dead-end mains and junctions.

b. **Profile Call Outs**

Manhole callouts in the profile are to include manhole number, type, size, stationing, rim and invert elevations, pipe size and compass locations of penetrations, and are to be shown complete for each manhole shown on the plans. Inlet pipe crowns shall be 1/10th higher than outlet pipe crowns.

Example: MH #2, Type I-48"
 Station 13 + 42 - 5' LT
 Rim 364.50
 I.E. 348.75 - 8" N in
 I.E. 348.95 - 6" S in
 I.E. 359.75 - 8" E in Drop Connection
 I.E. 348.75 - 8" E in
 I.E. 348.65 - 8" W out

c. **Plan Callouts**

Manhole callouts in the plan view are to include manhole number, stationing, type, and size.

- d. **Manhole Numbering**
Upon first submittal of the construction drawings for review, the City of Redmond will provide the numbering convention for wastewater manholes which shall be incorporated onto the construction drawings. These numbers must be legible and not interfere with wastewater appurtenances.
- e. **Knockouts**
Provide knockouts and channeling in manholes where future extensions are anticipated. These shall be shown on the plans.
- f. **Drop Manholes**
Drop manholes are allowed on a case-by-case basis with City approval, if the drop is 5 feet or greater when connecting to existing manhole structure. Drop manholes in new construction are allowed only in conjunction with a deep trunk extension. Drops shall be outside drops, constructed of ductile iron pipe. In addition, ductile iron piping will be required for the entire main to the next upstream manhole.
- g. **Maximum Depth**
The maximum depth of a manhole without special detailed design is 25 feet.
- h. **Ladder**
Locate the ladder and eccentric cone directly over the outlet pipe.

5. SIDE SEWER REQUIREMENTS

- a. **Size and Slope**
Side sewer stubs shall be minimum 6-inches in diameter and extended to the property or easement line. The minimum side sewer slope is 2%. When the slope is greater than 2% show the invert elevation at the property line. For side sewer stubs larger than 6-inches in diameter, manholes shall be used for the connection to the sewer main.
- b. **Finish Floor Elevations**
Show the minimum finish floor elevations on all lots and buildings. The minimum finished floor shall be 5.0 feet above the side sewer invert at the property line and may be greater depending on the distance to the structure.
- c. **Side Sewer Connections**
All projects shall install new side sewers to the main. Existing side sewers shall not be re-used. Existing side sewers shall be abandoned at the main or manhole.

6-inch side sewer pipes from homes or buildings shall connect to 8-inch or larger mainlines with tee connections. Side sewer connections to manholes

are not allowed, except at dead end manholes that will not be extended in the future.

For side sewers larger than 6-inches, manholes shall be used for the connection to an 8-inch or larger sewer main.

- d. **Double Services**
Double services for single family residences are to be wye'd within the lots being served. The maximum allowable differential between the floor elevations of the residences is 2 feet. A joint use side sewer agreement must be provided.
- e. **Service to Properties**
Side sewer stubs shall be provided for all platted lots. Stubs to unplatted land shall be provided as required by the Review Engineer. Multiple side sewers shall not be used in lieu of extending a sewer main. Side sewers shall generally be perpendicular to the street centerline.
- f. **Side Sewer Location**
Locate side sewers on the platted lot to be serviced and run directly from the building to the sewer main. Side sewers on adjacent lots shall not be installed in a common trench.
- g. **Side Sewer Length**
Side sewers shall be a maximum of 150 feet in length, unless otherwise approved.
- h. **Cleanouts**
Provide a cleanout at every bend and at minimum 100-foot increment.
- i. **Backwater Valves**
Install backwater valves on all side sewers where the finish floor elevation of the building is lower than the invert elevation of the upstream manhole.
- j. **Side Sewer Abandonment**
Existing side sewers that are no longer needed shall be abandoned at the sewer main. The side sewer shall be physically disconnected by using one of the following methods:
 - 1) Plugging or capping the existing side sewer tee at the main;
 - 2) Cutting the side sewer pipe at the outside wall of the manhole, grouting the penetration and rechanneling the manhole; or
 - 3) Removing the side sewer at the main when no tee exists and repairing the sewer main with a repair band suited for the pipe material or cutting out the tee and inserting a 5 foot section of PVC pipe with couplings.

6. CONNECTIONS TO EXISTING SEWERS

Connections to existing sewers for main extensions will be made by connecting to an existing manhole or constructing a new manhole over an existing pipeline. Drawings showing connections to existing manholes shall require core-drilling and rechanneling. For drawings which show a new manhole installed over an existing sewer, include a detail of construction for building over the pipe or use the City's saddle manhole detail, if appropriate. Saddle manholes shall not be placed over existing AC or concrete pipes. Existing AC or concrete pipes shall be replaced if a saddle manhole is used.

7. MISCELLANEOUS

a. **Pipe Callouts**

Show pipe size and manhole to manhole length in the plan view. Show pipe size, manhole to manhole length, pipe material, slope in %, and pipe class or strength (if not standard) in the profile. Pipe material shall not change between manholes. Pipe slopes are to be designed to tenths of a percentage. Establish slopes then calculate inverts. Do not set inverts then calculate slopes.

b. **Slope on Dead End Run**

Required minimum slope is 2% on the last manhole to manhole section of a dead-end run, unless otherwise approved by the City.

c. **Minimum Slopes**

Minimum slopes on main lines are:

8"	=	0.0050 ft./ft.
10"	=	0.0032 ft./ft.
12"	=	0.0025 ft./ft.

d. **Steep Slopes**

Pipe designs on slopes of 20% or greater, require the use of ductile iron pipe (SewerSafe or Protecto 401), hill holders and pipe anchors which shall be identified and detailed on the construction drawings..

e. **Deep Sewers**

Deep sewers (>15 feet) shall include submittal of pipe strength design data or calculations when requested. Use ductile iron pipe (SewerSafe or Protecto 401) when the pipe invert is greater than 15 feet below finished grade.

f. **Unstable Soils**

Remove unsuitable and unstable soil, such as peat, from under pipes. Applicant shall provide a geotechnical report for review in conjunction with

the construction plans when requested by the City. The geotechnical report shall include recommendations for special requirements that are to be included on the construction drawings necessary for installation of utilities in accordance with City of Redmond specifications.

g. **Trees**

Trees shall be located a minimum 8 feet horizontally from City-owned sewer mains, side sewer, and other sewer appurtenances.

h. **A.C. Pipe**

Existing A.C. pipe shall be required to be removed and replaced with ductile iron when crossed under or over by other utilities or where grading or other construction activities may subject the pipe to damage or loss of support. The pipe replacement shall be a minimum of 10 feet each side of any utility crossing. Where multiple A.C. pipe sections are being replaced due to utility crossings and/or construction activities, the City may require additional sections of pipe to be replaced to minimize creating an area prone to failure. The approved construction drawings shall delineate the replacement area. However, actual field conditions may require additional pipe to be replaced at the City's discretion.

Removal and replacement of A.C. pipe with ductile iron pipe shall also be required when the minimum pipe size requirement for the type of development necessitates the upsizing of the pipe.

Cutting and tapping of an A.C. main requires the operator to have asbestos cement work practices and procedures certification. Disposal of the removed A.C. pipe is required and shall be in accordance with the Puget Sound Clean Air Agency (PSCAA) requirements. A permit from PSCAA to perform the work is required prior to construction drawing approval. The contractor shall provide documentation of the permit and the verification of the proper disposal to the City prior to project acceptance.

i. **Building Footings**

Locate public sewers at least 10 feet from structures or footings. Building footings are to be designed, or sewers located, such that the footing will not bear on the pipe. In general, locate footings below the soil failure plane defined by a 1:1 slope extended up from a point 2 feet horizontal from the pipe invert (ie - the bottom edge of the utility trench nearest the footing) to ground surface.

j. **Rockeries/Retaining Walls**

Rockeries or retaining walls are not to cross or be in close proximity to sewer mains or side sewers. Where no alternatives exist, crossings under a rockery or retaining wall will require special construction techniques, including but not limited to, installation of steel casings, casing spacers, restrained gaskets and end seals. The Engineer-of-record shall design the

casing thickness, casing spacer size, quantity and clearances, and specify other construction techniques such that no load shall be transferred to the pipe.

The foundation of rockeries or retaining walls parallel (or adjacent) to sewer mains shall be located such that no load shall bear on the pipe. The foundation shall be located below the soil failure plane defined by a 1:1 slope extended up from a point 2 feet horizontal from the pipe invert (ie - the bottom edge of the utility trench nearest the foundation) to ground surface. Locate foundations outside of the utility easement.

- k. **In general, any sewer main, manhole, or appurtenances removed during construction shall not be reused on any part of the sewer system.**

SECTION VI SPECIAL APPURTENANCES

1. GENERAL

From time to time, special appurtenances will be required for various development projects including, but not limited to, sump pumps, pressure reducing stations, backflow preventers, booster pump stations, sewage pump stations, grinder pumps, oil-water separators, and grease interceptors. Calculations and designs for these appurtenances will be reviewed and approved on a case-by-case basis.

a. **Sump Pumps**

Sump pumps are to be avoided but are sometimes necessary for extremely deep utility vaults when required to discharge to the storm system and a gravity system can be demonstrated to be unfeasible. Special approval with easements and agreements apply and shall be required be in place prior to construction drawing approval.

b. **Pressure Reducing Stations**

Location and size of pressure reducing stations are determined by the Environmental and Utility Services Division. A pressure reducing station design shall include detailed plans and sections drawn at a horizontal and vertical scale of 1/2" = 1', delineating the vault layout and elevations, piping configuration, gravity drain and appurtenances, and elevation of all piping entering and exiting the vault. Notes referencing standard details without a detailed drawing are not acceptable. Refer to the latest edition of the City of Redmond Standard Specifications and Details for pertinent design information.

c. **Pump Stations**

Special conditions requiring booster pump station and sewage pump station shall require separate applications for those specific facilities for review and approval by the City. Design criteria will be dictated by the particular application and will require coordination with the City.

d. **Grinder Pumps**

Grinder pump applications are restricted to single-family residences and single commercial buildings which are physically unable to connect to the sanitary sewer system by gravity. For single-family residential applications, each grinder pump must have its own individual force main. The pressure discharge line must connect to a gravity side sewer from the sewer main. A maximum of four (4) pressure lines are allowed to manifold into one (1) gravity side sewer connection.

- e. **Oil-Water Separators**
Oil-water separators treat oily wastewater before the water is discharged to the sanitary sewer. Oil-water separators are required for underground parking structures, gas stations, and for all facilities where there is potential for the discharge of oily contaminated water. In addition, no grease, oil, sand, liquid waste containing grease or flammable material or other harmful ingredients in excessive amount may be discharged into a public sewer without the installation of a pretreatment process. Designs shall follow criteria established by the City and King County Wastewater Treatment Division.

- f. **Grease Interceptors**
Grease interceptors are required for all commercial buildings with kitchen and/or cafeteria facilities. In addition, no grease, oil, sand, liquid waste containing grease or flammable material or other harmful ingredients in excessive amounts shall be discharged into any public sewer without the installation of a grease interceptor. The sizing of the interceptor shall be in accordance with the latest edition of the UPC recognized by the City. The Building Division is responsible for approving the design and inspecting the installation of grease interceptors. For permitting questions, sizing criteria, or other information contact: (425) 444-2425.

- g. **Septic Tanks**
New on-site septic systems are not allowed in the City's service area. Existing septic systems on a parcel to be developed shall be shown on the construction drawings. If the location of the existing septic systems is unknown, contact the King County Health Department at (206) 296-4920, to see if a record drawing exists. All existing septic systems shall be removed or abandoned. Removal of the drainfield and septic tank may be required by the City. If the existing system is to be abandoned in place, abandonment shall be done in accordance with King County Health Department requirements.

SECTION VII EASEMENTS

1. GENERAL

- a. All easements needed for water and sewer main extensions are to be provided by the property owner in the name of the City. Show required easements on the construction drawings. Submit easement legal description(s) or plat markup for review at the time construction drawings are submitted for review. Easements must be executed prior to construction drawing approval, except when they are included with the final plat or short plat recording documents.
- b. Easement widths are a minimum of 20 feet, 10 feet on all sides of pipelines or appurtenances.
- c. Easements are to be prepared on the City of Redmond standard forms.
- d. if the easement is to be recorded with the plat or short plat document, a standard City of Redmond dedication statement must be included in the documents.
- e. Buildings, structures, garages, carports, dumpster enclosures, decks, fences, rockeries, retaining walls, or other permanent structures are not permitted in easement areas.
- f. The planting of trees, shrubs or vegetation having root patterns which may cause damage to or interfere with the utilities to be placed within the easement area, shall not be allowed.
- g. Easement areas shall not be landscaped or beautified in any way which would unreasonably increase the cost to the City for restoration.
- h. New easements, in accordance with current standards, are to be granted for properties which are redeveloping or undergoing tenant improvements.
- i. Before a project is accepted by the City, revised easements with the legal description of the as-built locations of the water and sewer extensions are to be provided, reviewed, and approved by the City.

SECTION VIII WATER/SEWER SERVICE AREA

City of Redmond water and sewer service area covers the area within City limits. The boundaries are as follows:

Roughly, the area east of 132nd Ave NE, south of NE 124th St, west of 196th Ave NE, north of NE 20th St, and excluding Marymoor Park and Lake Sammamish.

The City provides water and sewer service to customers outside of City limits. The City's Novelty Hill service area began in the late 1990s. The area includes Redmond Ridge, Redmond Ridge East, and Trilogy Urban Planned Developments northeast of the City in unincorporated King County along Novelty Hill Rd. The Novelty Hill service area boundary is as follows:

Redmond Ridge and Redmond Ridge East are roughly the area east of 220th Avenue N.E., south of Novelty Hill Road, west of 244th Ave NE and north of NE 80th St.

Trilogy is roughly the area east of 228th Avenue N.E., north of Novelty Hill Road, west of 248th Ave NE and south of NE 141st St (power lines).

Note: General parcel information for King County properties located in both incorporated and unincorporated areas can be obtained via the County's website. The King County GIS Center has an interactive mapping tool (iMap) that displays this information in the form of maps, tables, and text allowing visitors to search for a property using a parcel number, a street address, or a street intersection. Visit the County's website or follow the link listed for more information: <https://www.kingcounty.gov/services/gis/Maps/imap.aspx>

SECTION IX RECORD DRAWINGS

1. GENERAL

The construction drawings are to be revised to incorporate information pertaining to the water and sewer system improvement as it was constructed. The record drawings will meet the following minimum requirements.

- (a) The record drawings will provide the size, length and material of the as-constructed pipelines between fittings and manholes.
- (b) The record drawings will provide the size and joint type of each fitting and appurtenance actually installed.
- (c) The record drawings will provide the actual horizontal and vertical constructed water and sewer mains, fittings and appurtenances, correcting the location data provided in the drawings.
- (d) The record drawings will indicate the size, location and type (whether single or double) of all water and sewer service connection stubs installed by the contractor.
- (e) The record drawings will indicate areas of excessive cover and any other unique feature of the project.
- (f) The record drawings will be clearly denoted as such, with as-constructed information shown as a revision to the original design.
- (g) The record drawing location of easements will match the final legal descriptions of the easements granted to the City.

The information listed above is meant to be general in nature to provide the engineer/surveyor with what is required for record drawing submittal. More comprehensive information is outlined in the latest addition of the City's Record Drawing Requirements. Refer to this document for more explicit details.

SECTION X STANDARD WATER/WASTEWATER NOTES

The following notes are to be placed on the approved construction drawing:

WATER/WASTEWATER NOTES

GENERAL

1. Any Administrative Engineering Deviation Process regarding the water and sewer improvements shall be submitted to the City of Redmond Development Engineering Division for approval prior to implementation in the field.
2. All work and materials shall conform to the Standard Specifications and Details of the City of Redmond. Water and Sewer Specifications and Details shall be the specifications and details in effect on the date of approval of these construction drawings.
3. The contractor shall be responsible for locating all existing underground utilities. Call underground locate service, 1-800-424-5555 for utility marking. callbeforeyoudig.org/washington
4. No work shall commence prior to a pre-construction conference at the City of Redmond.
5. Coordinate with landscaping improvements.
6. No trees shall be planted within eight (8) feet of water or sewer improvements.
7. City of Redmond Design Requirements – Water and Wastewater System Extensions

WATER

1. All fire hydrants shall be covered with a burlap sack until the water system has been placed into service.
2. Fire hydrants shall be equipped with Storz connectors.

SEWER

1. Side sewers shall have a minimum slope of 2%.
2. New sanitary sewer mains shall be plugged and not put into service until lines have been cleaned, flushed and tested.

SECTION XI GLOSSARY

Appurtenances – An accessory used in utility installations including, but not limited to, sump pumps, pressure reducing stations, pump stations, grinder pumps, oil water separators, grease interceptors, and septic tanks.

City – City of Redmond or it's designated representative.

Contractor – Person, partnership, firm or corporation contracted to do the work under these documents. This also includes the contractor's agents, employees, or subcontractors.

Details – City of Redmond Standard Details or additional drawings prepared to further explain the work to be done.

Developer – Any individual, company, partnership, corporation, or group that has made, or intends to make, application to the City to construct a connection or extension to the City's water and/or sanitary sewer systems.

Engineer-of-record – Professional Engineer with current registration in the State of Washington that stamps and signs the construction drawings.

Review Engineer – City representative that reviews utility drawings for compliance with City standards, specifications and engineering practices.

Specifications – City of Redmond Standard Specifications or the prescribed directions, requirements, explanations, terms and provisions pertaining to the various features of the work to be done, manner and method of performance, or materials to be utilized.