

# **CHAPTER 5 SECONDARY WATER**

(Updated 04-02-19)

## **SECTION 5.1 GENERAL POLICIES**

### **5.1.1 GENERAL**

The design and construction of secondary water mains and other appurtenances in South Jordan City shall comply with these standard notes herein called "Secondary Water Standard Notes", or the permit requirements of various governing bodies, except where specific modifications have been approved, in writing, by the City Engineer. All submitted plans shall be stamped and signed by a civil engineer, registered in the State of Utah, and all work shall be in accordance with sound engineering practices.

Ordinances, requirements and applicable standards of governmental agencies having jurisdiction within the City's service area shall be observed in the design and construction of secondary water systems. Such requirements include but are not limited to current versions of the:

1. Municipal Code of South Jordan City.
2. Standard Specifications - American Public Works Association, State of Utah Chapter, Standard Specifications, current edition.
3. American Water Works Association.
4. American Society for Testing and Materials.

Secondary Water Standard Notes are subject to change to suit the needs of the Engineering and/or the Water Department.

### **5.1.2 DEVELOPER ENGINEER'S RESPONSIBILITY**

These standard notes establish uniform policies and procedures for the design and construction of the City secondary water system. They are not intended to be a substitute for engineering knowledge, judgment or experience. These procedures shall be reviewed by the developer's engineer and shall be applied as necessary to the project. Proposed deviations to these standards shall be submitted in writing, prior to preliminary plat and or development project approval.

It is the developer's (or his designee's) responsibility to be aware of the City's Secondary Water System Plan, Standards, and Specifications for secondary water system improvements and to indicate any main line relocations, extensions or over-sizing on the preliminary subdivision plat. A complete version of the master plan is available for review at the City's Engineering Department. This responsibility shall include investigating any changes from the Master Plan necessitated by development subsequent to the Master Plan, although the above shall not relieve the developer from the responsibility to provide an approved system consistent with Engineering Department requirements. Verification of the adequacy of the surrounding secondary water system rests jointly with the Engineering Department and the developer.

All plans, specifications, reports or documents shall be signed and stamped by a registered professional engineer, which will indicate responsibility for the plan design. A wet stamp is required on all documents except reproducible plans, where a stamp on the original is acceptable.

A "Preliminary Review" and or "Plans Approved for Construction" stamp or signature of the City on the plans does not in any way relieve the developer's engineer of the responsibility to meet all requirements of the City. The plans shall be revised or supplemented at any time it is determined that the City's requirements have not been met. Generally, plans that are signed as being authorized for construction will not require revisions based upon subsequent revisions to these standards, however, when the Engineering Department's opinion, a change to the project is necessary, based upon a significant change in the standards, which significantly affects public safety, future maintenance costs, or similar concerns, such a change may be required during construction by the City Engineer. Changes may also be required in the case where a developer does not proceed to construction within the time allowed in the agreement with the City.

The City Engineer will not accept the secondary water system until all applicable requirements of these standards and of the South Jordan City Municipal Code have been met.

## **SECTION 5.2 DESIGN CRITERIA**

### **5.2.1 CITY SECONDARY WATER SYSTEM**

- A. General. South Jordan City owns water shares in various canal companies, which canals are located within the City. The main secondary water sources within the City are the South Jordan Canal, Utah and Salt Lake Canal, Utah Lake Distributing Co. Canal, Welby Jacob Canal, Beckstead Ditch, Midas Creek, Bingham Creek, Little Willow Creek, and Dry Creek. The City's service area generally includes the region west of US Interstate 15 (1-15) to U-111 and between 9400 South and 11800 South and coincides with the City's boundaries wherever there is a source for secondary water.
- B. System Description. It should be noted that the City has a complete master plan for its secondary water system. As design of the secondary water systems is anticipated, every effort needs to be made to coordinate efforts with the Engineering Department to ensure present secondary water system requirements are met as well as providing for the future configuration of the secondary water system. The latest version of the master plan should always be considered, and discussed with the Engineering Department.

Secondary water lines shall meet City Secondary Water Line Standards and specifications and the developer will be required to construct all required "off site" facilities as required by the City Engineer and the City.

## 5.2.2 WATER MAIN PIPE TYPE, CLASS, PRESSURES, CAPACITIES AND SIZES

- A. Main Pipelines. In general, main and lateral secondary lines must be purple polyvinyl chloride (PVC) C-900 DR18 minimum PR 150 with tracer and caution tape (all wire connections need a moisture resistant nut).
- B. Sizing of Mains. Secondary water mains shall be a minimum of 8-inches in diameter.
- C. Water Demand Requirements. The secondary water system requires an application efficiency of 75% to support an annual requirement of 36-inches with peak demands of 11.88 gpm/acre.
- D. Depth. The standard minimum depth of cover from the top of the pipe to finish grade is 3-feet (36") for all secondary water lines. The standard maximum depth of cover to the top of pipe is 5-feet (60") for all secondary water lines, unless approved by the City Engineer prior to construction. Increases in depth may be required where future road improvements could potentially remove some of the existing cover or where there are other conflicting utilities.
- E. Pressure. Secondary water mains shall be designed to provide for service pressures between 55 psi and 100 psi.
- F. Compaction. Compaction of 96% is required using a modified proctor. The pipe needs to be bedded in sand from 6" under the pipe to 18" above the top of the pipe.
- G. Velocity. Secondary water mains shall be designed to provide a mean velocity of 5 fps in lines less than 24", and 7 fps in lines greater than 24".
- H. Hydraulics. Each development will be required to design a hydraulically accurate system for the development under consideration. City staff will review the design as submitted by the developer's engineer or certified irrigation/landscape professional.

## 5.2.3 LOCATION OF SECONDARY WATER LINES (Streets)

- A. Water Mains. Secondary water main lines, wherever possible, shall be located in public right-of-way parkstrip in the south and west side of the street. See Standard Drawings for separation requirements between any wastewater, storm lines, and water lines. However, where storm drains or other facilities are in conflict with the secondary water line, the secondary water lines should be located to provide a minimum of 5-foot clearance between the outsides of pipe (measured on a horizontal plane). This pertains as well to any case of parallel lines.
- B. Connection: It is required a 1-inch IPS individual connection. Two (2) lots may be served by a common service connection line using 2-inch IPS shared (dual)

## 5.2.4 LOCATION OF SECONDARY WATER LINES (Easements)

- A. General. Similar to culinary water standards, the installation of secondary water lines within easements should be avoided where a reasonable alternate solution exists. Installation of

secondary water lines should be within the park strips on the west and the south sides of the street (culinary lines are generally placed within the north and the east park strips), unless there are either physical limitations or extreme economic penalties. In general, the line within an easement shall be accessible by conventional maintenance vehicles traveling over paved roads or driveways unless otherwise approved.

- B. Width. Secondary water easements for pipes should be a minimum of 15-feet wide.

In the case that additional easement width is needed, Engineering Department approval is required. All plans should clearly indicate any known block walls, pavement, trees or other obstructions within a proposed easement.

- C. Pipeline Location. Pipelines shall generally be placed in the center of easements; only in unusual circumstances will a line be approved which is closer than 5-feet from the easement edge.

### **5.2.5 SEPARATION OF SECONDARY WATER LINES, CULINARY WATER, AND WASTEWATER.**

- A. General. Proper separation of secondary water, culinary water systems, and wastewater is necessary to reduce the potential risk for an outbreak of waterborne diseases. Secondary water line separations should be treated the same as sewer lines.
- B. Basic Separation Standards. Separation at crossings between secondary and culinary water is 10-foot parallel (horizontal) and a minimum of 18-inches vertical unless water line is in a casing (refer to culinary water standard notes). Therefore, when adequate physical separation cannot be attained, an increase in the factor of safety should be provided by increasing the structural integrity of both the pipe materials and joints by adding one of the following:
1. Extra heavy cast iron or ductile iron pipe
  2. Encasement with 4-inches minimum of concrete or sleeving with water quality pipe.

Each of these provisions must be extended for 10-feet on either side of the water line at 90 degrees to the crossing.

Backflow prevention devices are required in all properties with dual source irrigation system (culinary and secondary). See Section 2.8

### **5.2.6 BLOWOFFS, AIR-VACS, VALVES AND METER BOXES**

- A. Blowoffs. All water line blowoffs will require two (2) water valve boxes, one for water valve and one for blow off riser. Riser shall be threaded, with a thread protector cap and placed 6" below finish grade. For sizing details refer to the Secondary Water Standard Drawings.
- B. Air-Vac. Placed in standard 18-inch meter box with ball valve below air-vac. Refer to the Secondary Water Standard Drawings

- C. Valves. Valves shall be located for adequate control of service areas, as approved by the city engineer. All valves must be accessible with a standard 6' valve key, regardless of design or design change, and need to be a Mueller or Clow type valve. Nothing shall be constructed or installed within 5 ft of the valve.
1. All drain valves shall be Gate Valves.
  2. All valve bodies shall have marked the manufacture's name and pressure rating.
- D. Brass Marker. These shall be placed in front curb where the service is located marked with an "I" for irrigation and to be stamped and installed by the Contractor.
- E. Pressure Test. 35 pounds per square inch (P.S.I.) air tested, must be maintained for a minimum of 2 hours, and witnessed by South Jordan City Water Department. If water is being used, follow hydrostatic testing standards and notify South Jordan City Water Department 48 hours in advance.
- F. Fittings. All fittings are to be coated with poly fm grease and wrapped with 8-mil thick polyethylene.
- G. Meter Box. Refer to the Secondary Water Standard Drawings

### **5.2.7 STRUCTURAL REQUIREMENTS**

- A. Supporting of Valves. Valves and fittings shall be supported by the trench bottom and shall be independent of the pipe. When pouring thrust blocks around a fitting, the concrete should be around the fitting and not the joint.
- B. Thrust Blocks. Before pouring any thrust blocks, contractor shall give engineering inspector 24-hour prior notice. See Culinary Water Standards and Construction Details for more information on thrust blocks, also refer to Secondary Water Standard Drawings.
- C. Service Boxes. Refer to Secondary Water Standard Drawings.
- D. Manhole Lids. Water vault manhole lid specifications ASTM A 48-93, Class 35B Cast Iron construction, machined flat bearing surface, removable lid with pick holes, H-20 highway load rating; lid model with South Jordan City name and logo imprinted on lid and marked "Irrigation." Provide Model A-1180 manufactured by D&L Foundry & Supply, or acceptable equal.

### **5.2.8 PUMPING STATIONS, PUMPS, AND WEIRS.**

- A. Pump Stations. Facilities that work in conjunction with the pipeline to supply water for secondary purposes must be designed for reliability. The following criteria shall be considered:

1. All pump stations shall be designed above ground and be aesthetically pleasing with emphasis on minimization of their visibility, particularly with regards to any visual corridor.
2. All pump stations must have a dedicated source of pressurized water, fire hose, valve and nozzle to be provided for sump clean-out with suitable drain system for clean-out water. A backflow prevention device must be installed on any culinary connections.
3. Further, in any station, the required pumping capacity must be met with one pump of the largest size out of service.
4. At every pump station it is required that a control system be set up so that each pump operates approximately the same amount of time in any given period. Pump motors shall be of the high efficiency variety wherever it can be shown that the extra cost for the motor is less than the present value of 15 years of reduced energy costs.
5. All pump houses must be designed for easy crane access around the building and appropriate sky-light and around heavy equipment.
6. Operator manuals on all pump houses and equipment must be provided to the Water Department

B. Pumps. It is the responsibility of the developer to provide pumps in every developed lot or a central pump that will provide enough pressure to the subdivision to comply with the pressure requirements listed in these standards and the following:

1. Flow rates on pump designs will need to be designed accordingly.
2. Only centrifugal pumps may be used for those systems using individual pumps per each lot (1.5 hp typical).
3. All pumps adjacent to canal shall be self-priming with adequate flow, otherwise grading must allow for gravity feed from supply canal or water source.
4. All community system pumps shall be centrifugal or turbine type, and shall be located in the front of the lot as opposed to the back of the lot.

C. Weirs. All weir designs and installations must be approved by the canal company and South Jordan City.

1. All new weirs must be installed with a self-cleaning rotating screen (see City Specification).
2. For specific design guidelines contact the appropriate canal company.

### **5.2.9 BACKFLOW PREVENTION**

In order to comply with State and City regulations, all lots having a dual source irrigation system must install culinary backflow protection devices to protect the City culinary water system. The required devices include a manual disconnect, swing joint connection, and RP backflow assembly. Installation of these devices must be reported to the City within 24-hours.

Backflow assemblies shall be tested for functionality within ten working days of initial installation and annually thereafter. Annual test results shall be recorded with the Public Works Department. All backflow protective devices are to be installed, maintained and tested by and at the expense of the property owner. See South Jordan Municipal Code Section 13.04.370.

### **5.2.10 CONSTRUCTION**

- A. General. Refer to Culinary Water Details and Construction Standards for guidelines regarding staking, clearing and grubbing, quality of materials, removal and disposal of materials, and equipment to be incorporated into the work.
- B. City Inspections. All work shall be available for inspection at all times. The contractor must provide 24-hour notice prior to the start of any work. Failure to provide proper notification may delay the construction starting date.
- C. “As-Built Drawings.” Original “As-Built Drawings” shall be turned over and/or submitted to the Engineering Department along with two sets of blue line mylar prints, a .dxf file, and a .pdf. These shall reflect all actual improvements made, and shall give the accurate location of all new/or relocated facilities.
- D. Warranty Period and Defective Work. A warranty period of two years is required for all work after field acceptance of completed work. In the event that defective workmanship becomes evident within the warranty period, the work shall be replaced or repaired by the contractor without cost to the City. Failure or refusal to repair defective work shall cause exclusion from performing future work to be connected with the City’s system and legal action.
- E. Public Relations. The contractor shall conduct its affairs in a manner which will minimize disturbance to residents in the vicinity of the work. In this regard, standard working hours as specified in the Municipal Code and shall be observed unless prior approval is received, which also includes City observed holidays. The job site shall be maintained in a condition which shall bring no discredit to the City or its personnel, and all affected private improvements shall be restored to their original condition or better.
- F. Excavation and Trenching. See Culinary Water Details and Construction Standards for requirements.

#### **5.2.11 PROCEDURE FOR APPROVAL, PERMITS, AND PLAN CHECKLIST**

Approval for improvement plans and required permits are the same as for Culinary Water. The Engineering Department shall approve and have the necessary permits of all proposed work before construction takes place. Fees/charges are established in the South Jordan City Municipal Code; however, if there are items requiring special approval, the deposition of funds or agreements shall be available. Insurance certificates are also necessary to cover general liability, auto liability, and worker's compensation insurance.

A plan checklist for culinary water has been prepared, and it shall also be used for secondary water purposes. Refer to Culinary Water Details and Standards for the necessary information regarding the required permits.

#### **5.2.12 ABANDONMENT**

All existing water lines (culinary and secondary) or structures that are to be abandoned shall be indicated in the drawings. All abandonment and construction techniques shall be discussed with the Engineering Department inspector and approved prior to any such work.

Refer to Culinary Water Details and Construction Standards for abandonment of water lines and structures, which also apply to secondary water.