

DIVISION 33 – UTILITIES

33 10 00 WATER UTILITIES

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. The WSU Pullman campus is independently supplied by groundwater wells with four emergency interties with the City of Pullman. These wells pump domestic water from the Grande Ronde Aquifer. The water network fed by these groundwater wells is divided into two pressure zones: high and low. Both zones are available for domestic water or fire protection. The transfer station at Observatory Hill pumps water from the low zone to the high zone, and multiple crossover valves throughout the campus are capable of connected the two zones when required. Several reservoirs throughout campus maintain pressure and provide fire flow storage. The following are critical components of the water system:
1. Two active wells supply the high zone (Wells 6 & 8)
 2. Two active wells supply the low zone (Wells 4 & 7)
 3. Two emergency wells (Wells 1 & 3)
 4. Two reservoirs on the high zone: North Fairway Reservoir (2M gallons) and the Observatory Hill High Tank (100,000 gallons)
 5. Two reservoirs on the low zone: Observatory Hill Reservoirs East and West (2M gallons each)
- B. Connections to the two water zones shall be specifically engineered based on available site water pressures and project requirements. Designers and Contractors are responsible to confirm planned connections to the two zones with the WSU Construction Manager.
1. Designers shall reference the WSU Record Drawing archives and WSU Graphic Information Systems (GIS) for known existing conditions.
 2. In order to verify available water pressure at the project site, WSU Facilities Services will furnish fire service flow test results measured at the nearest available fire hydrants.

1.02 SPECIFIC DESIGN REQUIREMENTS

- A. Water system designs shall meet the requirements of the most current editions of Chapters 246-290 WAC and the Washington State Department of Health (DOH) Water System Design Manual.

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- B. The minimum diameter for service mains shall be 12 inches.
- C. Mains shall be buried at least 48 inches below finished grade (to the top of the pipe).
- D. Designers shall calculate yearly average domestic demand as the product of a 60 gallons per capita per day usage and projected population densities.
 - 1. Calculate maximum daily rate as 150% of this yearly average
 - 2. Calculate maximum hourly rate as 250% of this yearly average.
 - 3. System losses and unaccounted for usages shall be taken at 10 percent of the domestic demand.
- E. Designers shall size branch lines to meet either the maximum hourly domestic demand or a combination of maximum daily domestic demand plus fire flow – whichever is larger.
- F. The minimum diameter for service branch lines from the mains shall be four (4) inches. For buildings requiring smaller service connections, Designers may plan reductions at the curb line.
- G. For design purposes, line velocities shall not average more than 5 feet per second. Plans and designs that exceed this velocity require approval from WSU Engineering Services.
- H. No saddle taps are allowed for service connections. Use branch lines tees.
- I. Design pipe bedding per WSU Standard Detail Drawing C 31 23 33 “Standard Utility Trench & Pipe Placement.”

PART 2 - PRODUCTS

2.01 GENERAL

- A. Distribution main shall be one of the following (or approved equal):
 - 1. C900 or C905 PVC
 - 2. For sleeves, use ductile iron.
- B. Fittings shall be class 350 ductile iron per the most current and adopted version of AWWA A21.53.

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C. Jointing shall be mechanical.

1. Pre-approved manufacturers (alternatives require approval by WSU Engineering Services):
 - i. MegaLug
 - ii. ROMAC RG-PVC

D. Valves:

1. Shall be flanged, iron body, bronze mounted double disc gate; over eight (8) inches, valves to have non-rising stems. Maximum operating pressure shall be not less than 175 psi for valves up to twelve (12) inches.
2. Shall be installed vertically in level lines and shall meet most current and adopted version of AWWA C500 specifications. Flanges shall be faced and drilled, ASA Class 235, for use with full face gaskets.

E. Flanges shall be type 304 stainless steel or ductile iron, per most current ASTM 536-80, test rated at 200 psi, "Roman" Models SST or equivalent.

PART 3 - EXECUTION

3.01 GENERAL

- A. Design and install thrust blocks in accordance with the current Water Agencies' Standards Design Guidelines for Water and Sewer Facilities and the manufacturer's recommendations.
- B. Provide a Link-Seal assembly at the building penetration.

3.02 DISINFECTION

- A. New or repaired public drinking water systems shall be disinfected prior to connection, in accordance with the standards of the most current Uniform Plumbing Code as modified by Chapter 51-56 WAC, and in accordance with the most current version of ANSI/AWWA C651, "Disinfecting Water Mains."
- B. For installation of new lines and systems, the Contractor is responsible to ensure all chlorination is performed according to the most current version of ANSI/AWWA C651, and that adequate bacteriological sampling results are obtained from a WA State approved laboratory. Before placing new lines in service, submit written documentation of chlorination and bacteriological testing results to the WSU Construction Manager for review and approval by Environmental Health and Safety (EH&S) and the Water Distribution Manager.

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3.03 TESTING

- A. Conduct pressure testing in accordance with the manufacturer's recommendations. Contractor shall submit proposed pipe testing procedures to the WSU Construction Manager for review and approval by WSU Engineering Services.
- B. No testing water or chlorinated water may be discharged into the sanitary or storm sewer system in accordance with the most current and adopted version of Washington Administrative Code (WAC) 173-201A. All chlorinated water shall either be treated to remove chlorine prior to discharge into sewers, or discharged into an area which does not impact storm drains or surface waters. If soil is the only contaminant, wastewater may be discharged into the storm sewer catch basins provided they are protected using Best Management Practices (BMPs), per the requirements of WSU section 33 40 00 (Storm Drainage Utilities).
- C. The Contractor shall notify the WSU Construction Manager in writing at least 48 hours prior to testing. The Contractor shall make all necessary testing and sampling arrangements, making all necessary arrangements with the WA State approved testing laboratory. The Construction Manager shall notify the following of the date and time for flushing, testing, and bacteriological sampling:
 - 1. Facilities Services Water Distribution Manager
 - 2. WSU Environmental Health and Safety
 - 3. Pullman Fire Department (for Fire Suppression Water systems only)

END OF SECTION