

# Mechanical – Purchase Specs

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## 23 05 19.31 Sewer Submeter – Purchase Spec

### **PART 1 – GENERAL**

#### 1.01 DESCRIPTION

##### A. Purpose

1. This section covers sewer submeters for use in the Owner's water systems.

#### 1.02 QUALIFICATIONS

##### A. Approved manufacturers

1. Cooling Tower Sewer Submeter (Deduct and Charge)
  - a. Badger Meter – E-Series Ultrasonic Meter up to 2"
  - b. Master Meter – Octave Ultrasonic Meter larger than 2"
2. Irrigation Sewer Submeter (Deduct)
  - a. Sensus – accuMAG Meter
3. Twisted-pair shielded cable
  - a. Belden 88760
  - b. Or Approved Equal

#### 1.03 REFERENCES

- ##### A. Applicable codes, standards, and references codes, regulations and standards
1. NSF/ANSI Standard 61
  2. NSF/ANSI Standard 372
  3. AWWA C700 Standards
  4. AWWA C701 Class 2 Standards
  5. SPU Sewer Submeter Technology Requirements
  6. State and local codes and ordinances

#### 1.04 COORDINATION

- ##### A. Coordinate Operations and Maintenance training times with the Owner.
- ##### B. Contractor shall provide a completed "Mechanical Meter Profile Report" form per Specification 23 08 00.11 Appendix A for each meter.

## 1.05 SUBMITTALS

### A. General

1. Submittals shall be in accordance with Conditions of the Contract and Division 01 Specification Sections.
2. Submit detailed maintenance manuals and drawings, which include catalog information indicating the complete electrical and mechanical characteristics.
3. Submit dimensioned cross-sectional drawings (manufacturer's data sheets are acceptable).
4. Submit SPU meter acceptance verification of meter. SPU acceptance of meter must be obtained prior to purchase of meters.
5. Submit finished meter tests – Manufacturer's Certified Test Reports showing accuracy tests

## 1.06 OPERATIONS AND MAINTENANCE (O&M) MANUALS

- A. Operations and Maintenance Manuals shall be in accordance with Conditions of the Contract and Division 01 Specification Sections.
- B. Operations and Maintenance Manuals shall include catalog information indicating complete electrical and mechanical characteristics.
- C. Manufacturer's Certified Test Reports
- D. Manufacturer's drawings of meter wiring diagram.

## 1.07 MEETINGS

- A. Pre-installation conference
  1. The Contractor shall request a pre-installation conference with the UW Engineering Services water projects
- B. Attend meetings with the Owner and/or Owner's Representative as required to resolve any installation or functional problems.

## **PART 2 - PRODUCTS**

### 2.01 GENERAL

- A. These sewer submeter specifications are in accord with the Owner's policy to construct permanent installations with long life, coupled with maximum reliability and safety.

### 2.02 SEWER SUBMETER

- A. The following shall apply to the sewer submeters installed on the UW Campus:
  1. Sewer submeter shall have the following accuracy:
    - a. Minimum 95% accuracy for low flow rates

- b. 100 +/- 1.5% for normal operating flow
- 2. Sewer submeter shall measure in cubic feet (CF) and broadcast in 100 cubic feet (CCF)
- 3. Sewer submeter shall have a permanently sealed direct reading registers and encoders.
- 4. Sewer submeter shall accommodate a flow rate of 0.1 ft/sec to 33 ft/sec
- 5. Sewer submeter shall be made of lead-free material.
- 6. Sewer submeter shall have an operating range as follows:

Sewer submeter		
Size	Operating Range (GPM)	Extended Low-Flow
5/8", 5/8"x3/4"	1/8 to 25 GPM	0.1 GPM
¾", ¾"x1"	3/8 to 35 GPM	0.1 GPM
1"	½ to 55 GPM	0.4 GPM
1 ½"	1 ¼ to 120 GPM	0.4 GPM
2"	1 ½ to 170 GPM	0.5 GPM

- 7. Sewer submeter shall have a maximum pressure loss of 8 psi at the maximum continuous flow of the meter. Sewer submeter shall have a maximum operating pressure of 150 psi.
- 8. Sewer submeter shall be suitable ambient temperatures of -20 to 1200 F. Sewer submeter shall have a display for local meter reading
- 9. Sewer submeter shall be capable of AMR communication with Itron's data collection systems.
- 10. Sewer submeter shall not require the use of a strainer
- 11. Sewer submeter for installation on a cooling tower drain/blowdown shall be able to withstand any particulate that may be discharged.

**Sewer submeter shall supplied with 100W Itron ERT. The ERT must be programmed in "hard-to-read" mode.**

## **PART 3 - EXECUTION**

### **3.01 REQUIREMENTS**

#### **A. Application**

- 1. Provide sewer submeters on each of the following sub-systems:
  - a. Irrigation (Deduct)
  - b. Cooling Tower Makeup (Deduct)

- c. Cooling Tower Blowdown/Drain (Charge)
- B. General installation
  - 1. Identification
    - a. Reference section 23 05 53 Identification of Mechanical Piping and Equipment
  - 2. Installation
    - a. Only personnel qualified and experienced in this type of work shall make connections.
    - b. The installation of meters shall be done with care to avoid damage.
      - i. Meters showing damage after installation shall be replaced.
      - ii. Meters shall have adequate clearance to service, repairs, and replacement.
      - iii. Data collection cabinets hung improperly shall be properly secured and all paint scratches shall be touched up.
    - c. Provide adequate pipe diameters upstream and downstream of installed meter. See Manufacturer's recommendations.
    - d. Meters shall be installed such that the display can be easily read by a person without crawling under mechanical equipment or up on ladders to see the face of the meter. A shield shall be supplied if display is in direct sunlight.
    - e. Provide appropriate installation kit based upon pipe material.
    - f. Provide adequate slack in flexible communication conduit to allow for the removal of the sewer submeter.
    - g. Ensure AMR signal can be read by an Itron data collection system from the Seattle Public Utility's normal meter reading route.
    - h. On cooling tower fill lines, install meters such that no hose bibbs or other unrelated water uses are installed between the meter and the cooling tower inlet.
  - 3. UW will check the Contractor's work to ensure the accuracy of the installation.
    - a. The Contractor shall arrange with the Owner for the times when their services will be required, and under no circumstances shall the Contractor connect to the existing system without Owner's knowledge.
    - b. The proper connection of the wires and cables to other systems as specified is entirely the responsibility of the Contractor.
    - c. In the event the connections cannot be made as specified, the Contractor shall make the necessary corrections at his own expense.
  - 4. Install meters per manufacturer's recommendations.
- C. Mounting and electrical connections
  - 1. In accordance with manufacturer's installation instructions.
  - 2. Chargeable meters shall be mounted horizontally unless an alternate configuration is approved by the manufacturer and will measure accurately.

3. Cooling tower gravity drain/blowdown meters shall be installed with a loop seal, also known as an inverted pea trap. Install electric heat trace on the flooded portion of the loop seal for freeze protection over winter.

D. Testing

1. Contractor to verify meter is reading accurately.
2. Contractor to submit meter accuracy report of verified meter reading.