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PART 1 GENERAL

1.1 DESCRIPTION

A. Purpose

1. This section covers sewer submeters for use on the UW Seattle Campus on sewer systems. All sewer submeters shall be installed to be read wirelessly via the Itron ERT.

1.2 QUALIFICATIONS

A. Approved manufacturers

1. Cooling Tower Sewer Submeter (Deduct (Make Up) and Charge (Drain))
 - a. Refer to SPU Sewer Submeter Technology Requirements for approved meters
 - b. Up to 2": Badger Meter – E-Series Ultrasonic Meter
 - c. Larger than 2": Master Meter – Octave Ultrasonic Meter
 - d. Or Approved Equal
2. Irrigation Sewer Submeter (Deduct)
 - a. Refer to SPU Sewer Submeter Technology Requirements for approved meters
 - b. Krohne Enviromag or approved equal
3. Twisted-pair shielded cable
 - a. Belden 88760
 - b. Or Approved Equal

1.3 RELATED SECTIONS

A. Placeholder for future use

1.4 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 Automated Meter Reading Technology Requirements
6. State and local codes and ordinances

B. Attachments and Details

1. 23 00 00 Attachment #1 – Mechanical Meter Schematic

1.5 COORDINATION

- A. Coordinate design of utility services and associated mechanical systems in accordance with 23 00 00 Attachment #1 – Mechanical Meter Schematic.
- B. Coordinate Operations and Maintenance training times with the Owner.
- C. Cooling Tower Sewer Submeter installations shall be coordinated with associated

maintenance zone.

- D. Irrigation Sewer Meter installations shall be coordinated with the Irrigation Department.
- E. Coordinate pre-installation and final acceptance with Seattle Public Utilities (SPU)
- F. Submit a completed "Worksheet: Mechanical Meter Schedule" form per Specification 23 08 00.11

1.6 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

1.7 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.

1.8 MEETINGS

- A. Pre-Purchase meeting with SPU to determine meter requirements of the project.
- B. Pre-installation meeting
 - 1. The Contractor shall request a pre-installation meeting with the SPU, Campus Utilities and Operations, Maintenance Zone, and/or Irrigation Department.
- C. Attend meetings with the Owner and/or Owner's Representative as required to resolve any installation or functional problems.

PART 2 PRODUCTS

2.1 GENERAL

- A. Refer to SPU requirements for sewer submeters.

PART 3 EXECUTION

3.1 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/Overflow (Charge)

B. General installation

1. Identification and Labeling

- a. Reference section 23 05 53 Identification of Mechanical Piping and Equipment
- b. All wiring and devices shall be properly labeled in accordance with system diagrams and wiring details to identify device tag, name, and purpose.
- c. Wire labels shall be machine made shrink type labels and match wire designations on the instrumentation drawings.
- d. Field devices including flow meters shall be labeled with Brother P-touch or equal.
- e. Label in accordance with other sections of this specification.

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.
 - 1) Meters showing damage after installation shall be replaced.
 - 2) Meters shall have adequate clearance for service, repairs, and replacement.
- c. Provide adequate pipe diameters upstream and downstream of installed meter. Must follow Manufacturer's and SPU recommendations.
- d. Meters shall be installed such that the display can be easily read and accessible. Meter display shall be mounted at an easily read height (4' - 5') above finished floor (AFF). 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/power 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 which will include roadway or right-away.
- 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.

C. Mounting and electrical connections

- 1. In accordance with SPU installation requirements.
- 2. In accordance with manufacturer's installation instructions.

D. Testing

1. Contractor to verify meter is reading accurately, verify with SPU accordingly.
2. Contractor to submit meter accuracy report of verified meter reading.

END OF SECTION