Basis of Design

This section applies to the design and installation of metering and gauges for distributed and building mechanical utilities.

Design Criteria

- Design main meters and submeters as specified in UW Purchase Specifications.
- Provide thermometers and "pete's plugs" at all locations where fluid mixing or heat transfer occurs.
- Provide pressure gages at all services entering the building, at pressure-reducing valve outlets, pump inlets and outlets, and on other equipment where required for confirming satisfactory operation.

Design Evaluation

The following information is required to evaluate the design:

- **Programming Phase:** Provide a narrative of the intended metered utilities.
- **Schematic Design Phase:** Provide location of meters. See Mechanical: Commissioning section for items to be included in the basis of design. Provide anticipated use of resources, e.g. water, steam, etc. for comparison in our future reporting.
- **Design Development Phase:** Provide outline specifications and anticipated flow rates for meter size verification.
- **Construction Document Phase:** Provide points list for monitored meters (to be used by Test Engineer for verifying the remote output reading matches the local display).

Construction Submittals

- Submittal data should clearly indicate the meter is suitable for the anticipated operating temperature and flow range.

Products, Material and Equipment

- Domestic Water Meters, Reclaimed Water and Rainwater Harvest Meters, Central Cooling Water BTU Meters, Environmental and Process Chilled Water BTU Meters, Cooling Tower Make-up and Blow-down/Drain Water Meters, Hot Water BTU Meters, Natural Gas Meters, Steam Condensate Meters, Irrigation Meters, Hydronic Closed Loop Meters

- Provide main meters and submeters as specified in UW Purchase Specifications.

Pipe Accessories

- Provide industrial quality thermometers with thermowell and 9-inch scale length. Provide a scale range of 30° to 240° F in hot water piping, or 0° to 100° F in central cooling water or chilled water piping.
- Provide pressure gages with a 4-inch minimum size and a scale range approximately twice the operating pressure. Show units of measure on the face plate.
Power Monitoring

- Log total runtime and kW/hr energy consumption in 15 minute increments for variable frequency drives and chillers through the DDC system.

Installation, Fabrication and Construction

Meter Installation

- Install main meters and submeters as specified in UW Purchase Specifications.

Pipe and Fittings

- Install thermometers where they can be read from the floor.
- Mount pressure gages on ½-inch size pipe extensions with ½-inch shut off valves.

Duct Accessories

- In fume exhaust ductwork, install two Pete's Plugs made of non-corrosive material in the exhaust duct at 90° to each other around the circumference for the purpose of pitot tube insertion.
- Provide dedicated adjustable inclined manometer or magnahelic gauge on each air filter installed to indicate filter pressure drop.

END OF DESIGN GUIDE SECTION