ELECTRICITY

Main Building Meters

- Each building main shall be equipped with a socketed type meter of the form 9S.
- A test block servicing the meter shall be installed which can short out the current transformers and open the voltage sampling taps for servicing. A fused disconnect shall be installed between the voltage taps on the main bus bars and the meter. The fuses installed in the fused disconnect shall be a 1 ampere, quick blow type.
- The meter shall be a Itron Sentinel M# - B542002 - Contact Jim Dewey with questions. 805.893.2661 x1101
- The meters shall be connected to the Metasys system via a KYZ pulsed output to a digital input, which will be electronically converted to kW through an accumulator point. The pulsed output from the meter shall be connected to a Johnson Controls VAV controller on Binary Input 4.
- An Ethernet connection to the campus computer network (RJ-45) shall be located within 6 feet of the meter. The meter shall be connected to the campus computer network via a CAT-5 cable from the RJ-45 jack on the back of the meter to the provided Ethernet port. See Tom Howard (805-451-0327) at UCSB Facilities for information on network connections.
- The kW accumulator point shall be mapped into the Johnson Controls Building Automation System.
- Please contact Jim Dewey (contact information below) for proper sizing of current transformers.
- Meters available through McAvoy and Markham - call Rich Salemme - (949)-727-3966

Building Sub Metering

- Each distribution circuit shall be monitored with a Veris Hawkeye H8026 meter, networked into the Metasys N2 network. Individual data points, including kW, amps, volts, and accumulated kWh shall be mapped into the Metasys PMI.
- Hawkeye meters available through Johnson Controls.
- Any non State Funded Entity (UCEN Food Service, or recharge customers located within State Funded buildings shall be separately metered with an Itron Sentinel M# B542002 as detailed under “Main Building Meters” in this document.

NATURAL GAS

Main Building Meter
Each natural gas service to the building shall be equipped with a Dresser Roots rotary meter with an **IMAC pulser and Roots instrument drive**, providing a pulsed output to Metasys. This pulse shall be equivalent to a maximum of 0.1 pulse per cubic foot of gas. Each meter pulsed output shall be connected to a Johnson Controls Metasys digital input, electronically converting pulsed data into CFH through an accumulator point. Each pulsed input shall be connected to a Johnson Controls VAV controller at Binary Input 4. The connection shall be made with a shielded twisted triad cable of at least 18 gauge. Care should be taken to ensure the electrical connections to the high-speed pickup register are properly sealed with silicone grease.

- Do not locate gas meters in metering vaults. Please locate the meter above the ground.
- Install an appropriately sized inlet strainer of filter upstream of the meter
- Example: Building is determined to have a maximum natural gas flow of 3000 CF/H
  - Order Roots 3M-175ID (ID signifies Instrument Drive)
  - Order IMAC Pulsimatic Transmitter M# 300-SD-100 (100 pulses per rev.)
  - Questions - Call Jim Vossler at Vossler & Co. (818)-509-1112

**WATER**

**Main Building Meter**

- Each water main, potable and reclaimed, serving the building shall be equipped with a Sensus series "W" turbo meter with inlet strainer, equipped with a **high-speed pickup register** with gallon units. The meter will be connected to the EMS (Johnson Controls) with a shielded twisted 2-pair 18 gauge cable. Each meter pulsed output shall be connected to a Metasys digital input, electronically converting pulsed data into gallons per minute through an accumulator point. Each pulsed input shall be connected to a Johnson Controls VAV controller at Binary Input 4 and a separate 12 vdc power supply shall be provided to power the high-speed pickup register.
  - Example: Building has a 3" water main
  - Order Sensus W-350 turbo meter with high speed pickup register
  - Questions - call Chris Berg at Aqua Metrix - 909-923-1163

**CHILLED AND HOT WATER**

**Chilled Water Metering**

- Each chiller system shall be equipped with an Onicon System-10-N2 BTU meter. This BTU meter will include two Onicon matched temperature sensors and a bidirectional Onicon flow meter. Each BTU meter shall be connected to the Metasys system via the N2 Bus. Temperature, flow, BTUH and accumulated BTUs shall be mapped into the Metasys PMI.
- The BTU meters can be purchased through Johnson Controls and included in the JCI controls allowance for new construction.
Campus Chilled Water Loop Metering

- Each building chiller system shall have one BTU meter measuring the chilled water generated by the chiller, and one BTU meter measuring the chilled water supplied to or taken from the loop.
- All Virtual Chilled Water Loop control process shall reference these points in the control scheme for the building chilled water energy calculations (Johnson Controls).

Chilled Water Sub-metering

- Each chilled water circuit with a point of connection in front of the main building BTU meter shall be equipped with its own BTU meter.
- Any server room, clean room or recharge customer area located within a state funded building that uses chilled water shall be separately metered with an Onicon BTU meter as specified in the previous section.

Boiler Water Metering

- Each boiler system shall be equipped with an Onicon System-10-N2 BTU meter. This BTU meter will include two Onicon matched temperature sensors and a bidirectional Onicon flow meter. Each BTU meter shall be connected to the Metasys BAS via the N2 Bus. Temperature, flow, BTUH and accumulated BTUs shall be mapped into the Metasys PMI.
- The BTU meters can be purchased through Johnson Controls and included in the JCI controls allowance for new construction.

RECHARGE METERS

Note on Metering Recharge Customers

- If a building houses a recharge entity (any non-state funded program housed in a state funded building – see Jim Dewey for details) the utilities used by the recharge entity must be equipped with main building meters as described above.

Questions? - Call Jim Dewey, UCSB Energy Manager - 805.893.2661 x1101