SECTION 26 27 13 - ELECTRICAL METERING

PART 1 - GENERAL

1.1 DESIGN PERFORMANCE

A. All electrical loads connected to the campus electrical distribution system will be required to be metered utilizing a power and energy meter. The campus is a single electric metering premise for the local utility provider and is billed as a single user. The billed amount is required to be allocated across the campus by metering at all load points.

B. Provide electric metering at all service entry mains for each distribution panel at each building. Minimum requirements will be a multi-function revenue grade energy and power quality meter with datalogging and waveform capture and digital display. Buildings with highly sensitive research equipment will utilize a high performance energy and power quality meter with datalogging and waveform capture.

C. Provide submetering at each building load distribution center outgoing feeder for load monitoring. Minimum requirements will be a revenue grade energy and power meter with digital display.

D. Provide submetering for all temporary construction service loads. Minimum requirements will be a revenue grade energy and power meter with digital display.

E. Provide integration to Building Automation System (BAS) for each meter by way of campus ethernet. Acceptable communication protocols are BACnet and Modbus. BAS shall be provided with the following metering points from the meter registers:
   1. Energy – kWh Total
   2. Current - per phase
   3. Voltage - per phase line-line and line-netural
   4. Power - Real, reactive, and apparent; 3-phase total
   5. Power factor - 3-phase average
   6. Frequency – 3-phase average

PART 2 - PRODUCTS

2.1 SERVICE METER

A. Service Meter:
   1. A service meter will be required on the secondary side of the service transformer for each building connected to campus electrical distribution, with the meter located at the main distribution panel. Meter shall have a local display. Projects may have unique design considerations that will require discussions with Facilities Operations Department engineering staff. Meter data communication must be coordinated with Building Automation System (BAS) – interface requirements provided by Siemens.
   2. Install meter by the manufacturer at the factory prior to shipping.
   3. Acceptable Manufacturers:
      a. Electro Industries Shark 200 (preferred)
      b. Eaton IQ Series
      c. GE EPM 2000 Series

2.2 SUB METER

A. Sub Meter:
1. Submeter shall be required for metering of smaller loads within buildings or remote isolated campus loads.
2. Acceptable Manufacturers:
a. Electro Industries Shark 50B/100B BACnet enabled meter where wired Ethernet is available (preferred) or Electro Industries Shark 100S for wireless communication locations where wired Ethernet is not available
b. Eaton IQ Series
c. GE EPM 2000 Series
3. Sub-metering is required but not limited to the following installations:
a. Parking Lots
b. Street Lighting
c. Tenant Occupied Spaces
d. Construction Trailers and Site
e. LEED Measurement and Verification Requirements

2.3 HIGH PERFORMANCE METERING

A. Meter
1. Metering of buildings containing highly sensitive research shall be accomplished with a high performance meter. High performance meters shall have advanced power quality capability and waveform recording functions.
2. Install meter by the manufacturer at the factory prior to shipping.
3. Acceptable Manufacturers:
a. Electro Industries Nexus 1200 series
b. Eaton Power Xpert 4000/6000/8000 series
c. GE EPM 9000 series.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Provide all service and sub meters with hardware and software as needed for Bacnet interface to the BAS. Interface provided by Siemens.

B. Provide potential transformer, ratio and polarity tests and wiring checks.

C. Provide current transformer, ratio and polarity tests and wiring checks.

D. Refer to Section 23 09 93 for points list to be integrated with the BAS.

3.2 DISTRIBUTION SWITCHBOARD

A. Provide Kwh meters in all switchboard with 0.3 metering accuracy class.

B. Place metering in switchgear and protected by fusing and a disconnect.

C. Provide terminal blocks for wall wiring.

END OF SECTION 26 27 13