PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. The requirements of the General Conditions, Supplementary Conditions and the following specification sections apply to all Work herein:
   1. Section 25 11 00 – BMCS Networks and Workstations
   2. Section 26 00 10 - General Requirements
   3. Section 26 00 20 - Scope of Work
   4. Section 26 05 19 - Electrical Conductors - 600 Volts
   5. Section 26 08 13 – Testing

1.2 SUMMARY

A. Provide an automatic digital sub-metering system that will monitor the electrical usage in the locations shown on the drawings and will provide kWh and kW with either date and time of maximum or coincidental with respect to main utility service via a Windows software package.

B. The system components shall operate independently from the Headend and shall be designed in such a way that it may be interrogated both on and off-site.

1.3 REFERENCE STANDARDS

A. The sub-metering system and all components shall be designed, manufactured and tested in accordance with the latest applicable industry standards including the following:
   1. MID Accuracy Standards.
   2. ANSI C12.20 Accuracy Standards.
   3. CE Mark approved.
   4. California Bureau of Weights and Measures
   5. NFPA 70 - National Electrical Code (NEC)

B. All equipment and material to be furnished and installed on this Project shall be UL or ETL listed, in accordance with the requirements of the Authorities Having Jurisdiction, and suitable for its intended use on this Project.

1.4 SUBMITTALS

A. The following submittal data shall be furnished according to the General Conditions and Section 26 00 10 and shall include, but not be limited to:
   1. Sub-metering System* including complete descriptive data of all components, wiring, and software interface. Manufacturer's product data sheets for all metering system components.
   2. Wiring diagrams including CT wiring and system network wiring.
   3. Installation instructions.
   4. Field testing and start-up reports.
   5. Operating and maintenance manuals.

B. All items or equipment listed above with asterisks (*) shall be certified by the manufacturer using Manufacturer Certification "MCA" as set forth in Section 26 00 10. See Section 26 00 10 for certification requirements.

1.5 FIELD TESTING

A. Each metering panel shall be tested for accuracy. Submit start-up documentation.

1.6 IDENTIFICATION

A. Provide an identification nameplate for each metering cabinet and each installed meter.

1.7 WARRANTY

A. Comply with the requirements of the General Conditions and Section 26 00 10.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. If it complies with these specifications, Sub-metering System manufactured by one of the following manufacturers shall be acceptable:
   1. E-Mon D-Mon Class 3200 Smart Meter.
   2. Leviton.
   3. SATEC.

2.2 DIGITAL SUB-METERS

A. Meters shall be fully electronic with LCD digital four-line display with the following data:
   1. Kilowatt-hours.
   2. kW Demand.
   3. Real-time Load in kW.
   4. Volts per phase.
   5. Amps per phase.
   6. Power factor per phase.
   7. Meter Date/Time.
   8. ID code for communications.

B. 0-2 volt output split core sensor capable of remote mounting of up to 500 feet from the meter.

C. Onboard installation diagnostics and verification system.

D. RS-485 communications capability with up to 52 meters per channel. BACnet compatible.

E. Meters shall be provided with a self-contained backup system to maintain memory and display during power failures.

F. When multiple current sensors (no more than three per meter) are used they can be arranged to either add or subtract information. All sensors in parallel must be of the same amperage rating.

G. Sensors shall be of split-core configuration to allow installation without powering down. Sensors shall be available from 5 amps to 3200 amps.

H. Meters shall operate under the minimum conditions:
   1. Ambient temperature range: -20°C to 50°C
   2. Atmosphere: Non-Condensing relative humidity of 95%
   3. AC Line voltage variation: + or –25%
   4. AC Line frequency 50 to 400 Hertz
   5. Power Factor 0.5 leading or lagging
   6. Voltage overload +25% continuously; + 100% for 20 cycles
   7. Current overload: 100% without meter damage
   8. Voltage input: up to 600 volts rms ac
   9. Current input: up to 32000 amps rms AC

2.3 ENCLOSURES

A. Meters shall be capable of being housed in enclosures in-groups of 8, 16, or 24 meters. Refer to drawings for the number of meters required.

B. Enclosure shall come with factory-installed Internal Data Recorder.

C. Enclosure shall be industrial grade JIC steel with padlocking hasp.

D. Enclosure shall be wall mounted and shall be no larger than 30" high by 24" wide by 6" deep.

E. Enclosure shall have the meters mounted on the door so that all meter displays can be seen and read without opening the cabinet. Re-setting the local meters shall require the door to be opened.

2.4 SOFTWARE

A. Energy software shall provide for reading kilowatt hours and demand from the IDR or wireless data collector connected to E_Mon D-Mon meters and provide this information for analysis and /or billing.

B. Energy software shall be capable of reading "real-time" data from Class 3200/3400/5000 meters (kW, kVAR, kVa, Amps, Volts, Power Factor and Frequency.)

C. Energy software shall be capable of reading utility type meters via IDR interval data recorder such as gas, water, electric, BTU, steam, etc. equipped with a pule output.

D. Energy software shall be capable of printing out electric bills and usage information.

E. Energy software shall have graphic capabilities (profile) to provide analytical charts and graphs, with demand profiling for 5-, 15-, 30-, or 60-minute sampling rates.

F. Energy software shall be capable of supporting declining block tariffs, up to eight time-of-use rates and up to four seasonal rates.

G. Energy software shall provide file export to spreadsheets for specialized applications.

H. Energy software shall be capable of reading gas, water and other meters types with pulse output.

I. Energy software shall be capable of supporting 1,000 locations.

J. Energy software shall be capable of exporting MV-90 (hhf) files.

PART 3 EXECUTION

3.1 Provide complete wiring diagrams to the Contractor for his use in interfacing the equipment. Also submit these diagrams with the shop drawings.

3.2 This Contractor is responsible for installation of system and all wiring. Wiring shall be in strict accordance with the manufacturer's recommendations.

3.3 Each system shall be started up under the supervision of the manufacturer's technician Start-up services include 8 hours of on-site trouble shooting and training classes at the job site for Owner operation, maintenance and servicing.

END OF SECTION