SECTION 16310D - MEDIUM VOLTAGE SUBSTATION

A. DESCRIPTION

1. Medium voltage substation shall be a free-standing metal structure, having front and rear accessibility, and front and rear lineup. The substation shall consist of:
   a. Primary load break transformer(s) fused switch(s)
   b. Medium voltage transformer(s)
   c. Main secondary overcurrent protective device
   d. Secondary distribution section(s)
   e. Copper bus
   f. Mimic bus
   g. Special features such as busway connections, key interlocking, tie switches, transformer fan cooling
   h. Enclosure
   i. Main secondary bus metering, electronic digital readout type

2. Where load exceeds 1000 KVA, provide double ended substation. Consult University Project Manager for power source(s)

B. SUBMITTALS

1. Shop Drawings
   a. Overall dimensions, front view, and sectional views
   b. Bus arrangements including ampere ratings of bus bars
   c. Type and spacing of bus supports
   d. Maximum short circuit bracing
   e. Circuit breakers, or fused switches
   f. Provision for future extension
   g. Elementary diagrams and wiring diagrams having their terminals identified, and indicating internal wiring for each item of equipment and interconnection between items
   h. One-line diagrams
   I. Bill of materials

2. Product Data
   a. Installation instructions on accessory equipment.
   b. Assembly instructions.

C. WARRANTY

1. Provide 2 year manufacturer's warranty for equipment.

2. Warranty shall run from date of issuance of certificate of substantial completion, not from date of acquisition.

D. SECONDARY DISTRIBUTION SECTION(S)

1. General: The secondary distribution sections shall be a circuit breaker system, no fuses. The main secondary bus shall be metered using Square D Power Logic system, with system display.
System shall be capable of measuring and display on demand, phase/line current, phase/line voltage, KW, KVA, KVAR, and power factor. Information shall be held in non-volatile memory until reset. The metering system shall have the capability to transmit information to the University’s Central Monitoring System.

2. Main circuit breaker, and feeder circuit breakers shall be electronic trip type, having field installable rating plugs. Circuit breakers shall be 100% rated. Provide ground fault protection where required by the NEC. Main circuit breakers shall have provisions for zone selective interlocking on short time and ground fault functions.

3. Provide 30% spare circuit breaker mounting space for future use.

E. TRANSFORMER(S)

1. Provide dry type transformers as integral part of unit substation assembly. Refer to Section 16322D for transformers.

2. Transformer kva rating and voltage shall be as indicated on drawings.

F. PRIMARY SWITCHES

1. Primary switches shall be as in Section 16360D.

G. INSTALLATION

1. Install unit substation on four inch thick concrete base.

2. Base shall extend 4″ beyond each side of switchboard.

3. Provide identification as described in Section 16195. Also provide mimic bus installed on front of substation. Bus to be made of acrylic plastic, 3/8 inch wide, applied with sheet metal screws.

4. Verify location where equipment is to be located and check to see that equipment will be able to fit required space and that equipment is shipped in proper sections for access to equipment room. Also verify that sufficient access is provided for removal and replacement of defective equipment.

5. Meters, ground fault and related equipment to be installed and tested and calibrated by substation manufacturer.

6. Provide test results to engineers representative.

7. Provide complete coordination study between primary system, unit substation, distribution panelboards, motor control centers, and downstream overcurrent devices 225 amp and larger. All devices to have their settings adjusted according to this study.

END OF SECTION