**1. ELECTRIC METERS**

1.1 BUILDINGS SERVED BY UNL, GENERAL REQUIREMENTS:

* 1. Meter socket will be provided as part of the Project. Meter will be furnished and installed by UNL.
  2. Single position meter socket shall be provided. Meter centers or modular multi-position meter equipment serving multiple services are prohibited.
  3. For all electrical services: provide a 20 amp rated, instrument transformer type meter socket with integral test switch. Provide current transformers (CTs) with instrument rated meter sockets. See paragraph below for requirements of instrument transformers.
  4. Meter Socket Specifications:
     1. Meter sockets shall have a short circuit current rating of a minimum of 10,000 RMS symmetrical amps at the rated voltage of the associated electrical service.
     2. Meter sockets shall be ringless type, UL listed, and shall meet ANSI C12.7-2005 requirements for watt-hour type sockets.
     3. Meter sockets shall be NEMA 3R rated for outdoor installations.
     4. Instrument Rated Type Meter Socket - Three Phase, Four Wire: meter socket shall be form 9S with 13 terminals. Milbank #UC7449-XL-871-ALT with test switch #TS10-0109 or equal. CTs provided by the Project.
     5. Instrument Rated Type Meter Socket - Single Phase, Three Wire: meter socket shall be form 4S with 6 terminals. Milbank #UC7532-XL with test switch #TS07-0105 or equal. CTs provided by the Project as described below.
     6. Meter sockets shall be provided with fuse clips & fuses for protection of voltage taps from the source circuit into the meter socket.
  5. Meter Socket Location Requirements:
     1. Meter sockets shall be installed outside of the building. It is UNL preference that the meter socket be installed directly onto the service transformer enclosure. Where not possible to install onto the transformer or where explicitly authorized by UNL, meter socket shall be mounted on the building exterior and a CT cabinet shall be provided adjacent to the meter socket. See paragraphs 2, 3 & 4 below for specific requirements for each installation location.
     2. Indoor meter socket locations are not allowed.
     3. Meter sockets shall be located in a readily accessible, safe, and convenient location. Minimum working clearances required by the NEC shall be provided and maintained around meter socket locations.
     4. Meter sockets shall be located in non-hazardous locations as defined by the NEC and located a minimum of three feet from any gas meters and ten feet from any fuel tanks.
  6. All meter sockets shall be labeled per UNL standard labeling convention.
  7. Meter sockets shall be grounded in accordance with NEC requirements. See paragraphs below for specific requirements for each installation location type. The neutral conductor of the service entrance shall be solidly bonded in and to the meter socket and at the CT cabinet where applicable.
  8. All service entrance wires shall pass through the meter socket and the CT cabinet as applicable. The meter socket and CT cabinet shall not be used as a wiring raceway or pull box. Meter sockets shall be installed with the blank protective cover (jumper panel) and the meter-sealing device in place and shall be prepared for meter installation by UNL.
  9. In addition to any and all additional conduits connected to meter sockets, a 1-1/2 inch dedicated conduit with a pull string rated for 300 lbs. break strength shall be provided. Conduit shall be routed from the meter socket into the building for connection into building management system. Associated communication cables by UNL.
  10. Temporary metering is a general requirement for new and renovation projects. The Project shall provide temporary metering as required and in coordinate with UNL guidelines for temporary facilities outlined elsewhere.
  11. Meter and associated equipment wiring methods shall be such as to allow for straightforward, uncomplicated tracing of circuits. All wiring work associated with meter sockets and associated equipment shall be neatly trained, bundled, organized, and labeled per standard industry practice and quality workmanship standards.
  12. Current transformers (CTs) shall be provided by the Project. CTs shall be sized to 50% of the main switch size (i.e. a 1000A switch implies a 500:5 rated CT set). CTs shall be solid core, window type units meeting ANSI C12.11 and C57.13 requirements with an accuracy of 0.30. CTs shall have a rating factor of 2.0 (minimum) at 55 degree Celsius operation temperature & rated for 600V systems. Provide iTron R6 series CTs or equal.
  13. CT cabinets (where required): Nominal 36” x 36” x 12” NEMA 3R, 600V, 50K AIC rating, double door, 3-point latch with pad lock provision. Hoffman #A1200NECT-MOD or equal. Provide with integral wiring buss work for window type CTs.
  14. Buildings Served by UNL, Meter Socket at Transformer: Install meter socket at main electrical service transformer on the exterior of the transformer enclosure. Mount to the transformer within the ‘dead front’ zone of the transformer along the secondary compartment area. Mounting height of socket shall be between a minimum of four foot to a maximum of six foot above finished grade, as measured from the center of the meter glass. Provide a minimum No. 6 bare solid copper ground wire continuous from the neutral landing block of the meter socket to the driven ground rod at the transformer. Attach to ground rod with dedicated clamp. Install the instrumentation transformers in the secondary compartment and route the wiring to the meter socket. Neatly train all cables.
  15. Buildings Served by UNL, Meter at Building Exterior: Mount meter on exterior wall of building as close to the service entrance and service transformer as possible. Mounting height of socket shall be between a minimum of four foot to a maximum of six foot above finished grade, as measured from the center of the meter glass. Do not locate directly below building downspouts. Mount the CT cabinet adjacent to the meter socket and provide a 1-1/2 inch conduit for instrument wiring between the enclosures. Provide a minimum No. 6 bare solid copper ground wire continuous from the neutral landing block of the meter enclosure to a dedicated ground rod below the meter socket. Ground rod shall be 5/8” x 8’ (minimum) copper clad with ground rod clamp.
  16. Buildings Served by Municipal Electric Utility Provider: UNL will obtain an output signal from the municipal meter. Install a 12”x12” lockable, weatherproof box within 12” of the municipal meter socket panel, and provide a 1” diameter nipple to the municipal meter panel. All work shall be fully coordinated with the appropriate Municipal Electric Utility representative and associated Meter Department Manager.
  17. Panel Mounted Meter: In addition to the main electric meter described above the Project shall provide a second meter integral to the building main distribution panel, switchboard or switchgear. Panel meter shall provide complete electrical measurements and historical data logging. Meter shall be a traceable, metering grade unit capable of RS485 Modbus and KYZ input/output communications. Unit shall include 100BaseT Ethernet connection port. Shark 200 Series digital meter or equal. Unit shall be installed by panel manufacturer at factory prior to shipment. Where a standalone meter is required indoors, locate the device adjacent to the main panel board. Standalone meter unit shall be an all-in-one piece of equipment with terminal blocks for CT and PT wiring, step down transformer (if needed) Ethernet connection, all in NEMA 1 lockable enclosure. Provide Shark 200 meter-in-a-box or equal.

END OF SECTION 33 77 00