

# **DIVISION 26 – ELECTRICAL**

## **26 10 00 MEDIUM VOLTAGE ELECTRICAL DISTRIBUTION**

### **PART 1 - GENERAL**

#### **1.01 GENERAL**

- A. Washington State University currently owns, operates, and maintains a 5kV distribution system using two 5kV substations – one at either end of campus – with individual feeders to campus loads. This section applies to facilities connected to the WSU 5kV distribution system.
- B. WSU is in the process of gradually transferring primary feeder service to the local utility (Avista) 13 kV feeder system. Where possible, newly constructed facilities shall connect to the utility 13 kV system. New construction service connections to the WSU 5kV distribution system require approval of the WSU Project Manager and Engineering Services.
- C. WSU's East Campus Substation contains feeder EB13, which is the source for NEC 700 loads. Feeder EB13 is backed by emergency generator located at the Grimes Way Steam Plant. All newly constructed facilities shall connect to feeder EB13 for NEC 700 loads. Exceptions to this rule require approval of the WSU Project Manager and Engineering Services.

#### **1.02 SERVICE CONNECTIONS**

- A. Provide four 4" conduits from the steam tunnel to the main building transformers: two conduits for normal primary service and two conduits for emergency primary service. This provides one spare conduit between transformer and tunnel that can be used for a feeder tap on the loop fed transformer, or as spare in case of a fault in the cable.
- B. Entrance to steam tunnel shall be through long sweep elbows with entrance leg parallel and against inside of tunnel wall, so that the entering cable does not obstruct or reduce the tunnel walkway.
- C. Provide an above-ground 15KV Junction Enclosure with minimum four-position LBC. Provide spare raceway sleeves to adjacent utility tunnels. Coordinate quantities with WSU Engineering Services.

#### **1.03 TRANSFORMERS**

- A. Transformation from primary voltage shall be accomplished by a three phase pad mount transformer on the exterior of the building.
- B. Accessories for all transformers shall include the following:
  - 1. Tap Changer – two 2-1/2% FCAN and two 2-1/2% FCBN
  - 2. Ground lug

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3. Pressure vent
  4. Drain valve
  5. Dial type thermometer
  6. Lifting lugs
- C. Pad mount transformers shall have a built-in, hot stick operated, load break primary disconnect, and factory installed overcurrent fusing.
- D. Transformer connection: Primary -- 4160/2400V delta. Dry-type transformers are not permitted for loads exceeding 300 KVA.
- E. Primary disconnects, where used, shall be suitable for the environment in which they are installed.
- F. Transformers will not be used that have/contain PCB oils. All transformers shall bear a permanent label with this statement. Adhesive labels and non-metallic labels are not acceptable.
- G. All transformers shall be U.L. listed, or shall bear listing from a Washington State approved listing agency.

#### **1.04 DRY TYPE TRANSFORMERS**

- A. Dry type transformers shall be the two winding type, totally enclosed except for ventilation openings, have Class h insulation, and rated for continuous operation at full load without exceeding manufacturer's stated temperature rise above 40° C. ambient temperature. Core and coil shall be mounted on isolation pads. Lugs to be rated for 75° C operation.
- B. The use of dry type transformers shall be limited within the building. Use outside pad mount transformers with two distributions, 120/208V for general loads and 277/480V for lighting and motor/mechanical loads.
- C. Typically, 30 or 45 kVA dry type transformers are used to provide power for emergency systems, i.e. egress lighting and fire alarm systems.

#### **1.05 FUSES**

- A. All medium-voltage fuses shall be indicating.

### **PART 2 - PRODUCTS (NOT USED)**

### **PART 3 - EXECUTION**

#### **3.01 GENERAL INSTALLATION**

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- A. Thermographic Scan: Conduct a Thermographic scan on all 5kV connections. Initial Thermographic scan shall be performed during the peak demand period. Provide a second Thermographic scan one year after conducting the initial scan. Schedule all Thermographic scans with the WSU Construction Manager and Engineering Services.

**END OF SECTION**