
262100 MEDIUM VOLTAGE TRANSFORMERS

Part 1 – GENERAL

1.1 Description

A. This section details the guidelines and expectations for the design and installation of transformers on Johns Hopkins University Homewood Campus. Project conditions and requirements vary, thus precluding the absolute adherence to the items identified herein in all cases. However, unless there is adequate written justification and approval from the JHFRE Engineering and Energy Department, it is expected that these guidelines will govern the design and specifications.

1.2 Submittals

N/A

1.3 Quality Assurance

A. The substation transformers shall be designed, manufactured, tested and installed in accordance with the latest applicable standards of NEMA and ANSI, particularly NEMA 201 & 210, IEEE 100 and ANSI C57.

B. All work must meet NEC standards and materials must be UL Listed.

C. Medium Voltage substations shall be surrounded by an 8' tall chain link fence with privacy slats. The ground area inside the substation shall be covered with limestone gravel. The gravel and barrier shall extend 3' outside of the fence line and 3' past the gate swing area.

D. Maximum ground resistance shall be 5 ohms at transformer location per NFPA and IEEE recommended value.

Part 2 – PRODUCTS

2.1 Preferred manufacturers

A. Square D/Schneider Electric

B. ABB

C. Eaton/Cutler-Hammer

D. Siemens

2.2 Aluminum windings in transformers are not permissible.

2.3 All substation transformers shall have high voltage windings that are cylindrical/disc and copper wound. Low voltage coils shall be cylindrical/disc and copper wound. Coils shall be designed to make use of directed fluid flow.

- 2.4 No load break elbows are allowed.
- 2.5 Outdoor pad mount transformers shall be mineral oil filled with no load tap changers.
- 2.6 No dry type medium voltage transformers are acceptable outdoors.
- 2.7 Indoor medium voltage transformers may be dry type or cast coil. No liquid filled transformers will be considered for indoors.

Part 3 – EXECUTION

- 3.1 All exterior transformers shall be surrounded by a fence. If metallic, the fence needs to be grounded. The grounding grid needs to extend at least 3' outside of the fence line and 3' past the gate swing area.
- 3.2 Bollards shall be placed around transformers in high traffic areas but they shall not impede access panel opening.
- 3.3 Ensure clearance is provided for maintenance. The space must conform to NEC safe working distances.
- 3.4 Outdoor oil-filled transformers shall be set in a containment area that is served by a sump pump. The pump shall be tied to a liquid level in the transformer that shuts off the pump if the oil level drops. Containment covers shall not be used.
- 3.5 Transformer shall be installed level and plumb and shall tilt less than 1.5 degrees while energized.