SECTION 26 22 00
DRY-TYPE TRANSFORMERS
Design Standard

PART 1 GENERAL

1.1 PURPOSE

This design standard has the purpose of providing dry-type transformers with a level of quality which meets the requirements throughout the San Mateo County Community College District for all renovation and new building projects.

PART 2 PRODUCTS

2.1 Design and specify dry-type transformers to step-down high voltage power to end-user voltages (ex. 277V for lighting, 120V for convenience receptacles).

A. Provide transformer coils of the continuous wire wound construction and impregnate with nonhygroscopic, thermosetting varnish prior to baking.

B. Maximum temperature rise at full load: 150 degrees above 40C ambient temperature. NEMA TP-1 compliant or latest energy efficiency standard.

C. Provide windings continuous from start to finish. Splicing is unacceptable. Materials incorporated must have at least a minimum of 1 year of proven field usage. Accelerated laboratory test not acceptable.

D. All cores manufactured from a high-grade, nonaging silicon steel with high magnetic permeability, low hysteresis and eddy current losses. Magnetic flux densities are kept well below saturation to allow for a minimum of 10 percent over-voltage excitation.

E. Ventilated openings must be designed in a manner as to prevent accidental access to live parts.

F. Transformers shall be dry-type, with copper windings.

G. In locations where the transformer serves computer classrooms, the transformer shall at the least be “K13” rated. Due to code requirements for California, all transformers shall be energy efficient and be rated, TP-1.

H. Mount all transformers, core and coil, on vibration mounting pads designed to suppress transmission of 120 cycle frequencies and harmonics thereof. Arrange and select pads in consideration of core and coil weight. Provide additional noise suppressing mountings external to transformers where transformers are located in mechanical spaces.

I. Maximum case temperature, 35C above ambient.

J. Sound levels guaranteed by manufacturer, 45dB through 150KVA and 50dB through 300KVA.

K. Winding Taps:

1. Less than 15KVA: 4-2-1/2 percent FCBN, FCAN.
2. 15KVA and Larger: 4-2-1/2 percent-2+2-.

L. Where possible; all transformers shall be placed within the building or below grade.

1. Only under special circumstances and as approved by the District, shall a transformer be allowed to be exterior pad mounted. If the design team provides an exterior yard for equipment, pad mounted transformers may be considered.
2. Provide weather resistant enclosure and factory rating for exterior where shown at exterior locations.

3. Provide transformers with 8-inch round by 24-inch (above and below grade) concrete and steel bollards where subject to vehicular traffic.

M. Transformers up to 45KVA may be floor mounted, wall mounted or suspended. Floor mount all transformers above 45KVA rating.

N. Transformer Supports: Provide additional vibration isolation hangers and pads, brackets and supports as may be required for a complete installation.

O. Provide transformers with concrete working or housekeeping pad minimum 8 inches larger than transformer and minimum 3 inches above finish grade. Install plumb and level. Provide exterior pads of 2500 to 3000 psi concrete reinforced with 8 gauge wire fabric or No. 6 reinforcing bars on 12-inch centers. Provide 10-inch thick base of gravel below pad for support. Pad extends 6 inches on all sides from the exterior most prominent dimension. Provide 3/4-inch by 10-foot ground rod at each corner thermally bonded to No. 2 copper ground conductor, bonded to transformer, and concrete reinforcement.

P. Do not mount transformers closer to combustible materials than allowed by CEC.

Q. Provide adequate ventilation, mount transformers away from adjacent surfaces as recommended by manufacturer.

R. Use flexible conduit, 18 inches minimum length, for connections to transformer case. Make connections to side panel or bottom of enclosure. Include ground conductor in flex.

S. Mount wall mounted transformers with a minimum of 6'-6" headroom below unit.

T. Provide seismic restraints per local requirements.

2.2 APPROVED MANUFACTURERS

A. Eaton Electrical
B. General Electric
C. Jefferson Electric
D. Siemens
E. Square D
F. Powersmith
G. Hammond

PART 3 EXECUTION

3.1 SUBSTITUTES ALLOWED?

Yes, if performance and quality equivalency can be evidenced.

3.2 ASSOCIATED DESIGN STANDARDS AND CONSTRUCTION SPECIFICATIONS

Division 26 Design Standards and Construction Specifications

END OF SECTION