SECTION 16460

DRY TYPE TRANSFORMERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The general provisions of the contract including General and Special Conditions and General Requirements shall apply to all work under this Section.

1.2 DESCRIPTION OF WORK

A. Provide dry type transformers in accordance with the Contract Documents.

1.3 RELATED WORK IN OTHER SECTIONS

A. Related work in other sections:

1.	Electrical General Provisions	Section 16010
2.	Raceways and Boxes	Section 16110
3.	Wire and Cable	Section 16120
4.	Electrical Identification	Section 16195
5.	Grounding	Section 16450

1.4 STANDARDS

A. The transformers and all components shall be designed, manufactured and tested in accordance with the latest applicable standards of ANSI, NEMA and UL.

B. Transformers shall meet the requirements of the most current version of federal law 10 CFR Part 431 "Energy Efficiency Program for Certain Commercial and Industrial Equipment".

1.5 SUBMITTALS

A. Shop Drawings: Submit shop drawings and manufacturer's data for each type and size dry transformer as indicated on the Drawings

PART 2 - PRODUCTS

2.1 APPROVED MANUFACTURERS

A. All transformers shall be of the same manufacturer as the the other major electrical distribution equipment on the project.

2.2 DRY TYPE TRANSFORMERS IN GENERAL

A. Transformers shall be 115 degrees C temperature rise above 40 degrees C ambient. Transformers shall be capable of carrying a 15% continuous overload without exceeding a 150 degrees C rise in a 40 degrees C ambient. Transformer to be a minimum "K-13" rating.

B. All insulating materials shall be suitable for 220 degrees C UL component recognized insulation system.

C. Coils: Coil conductors to be continuous with terminations welded without auxiliary flux material. Wind coils with copper or aluminum magnet wire, vacuum impregnated with non-hydroscopic, thermosetting varnish. Coils to be protected with an outer layer of glass tape or similar quality insulation. Provide each layer with end-fillers or tie-downs to ensure maximum mechanical strength. Brace tap terminations to magnet wire. Brace primary and secondary magnet wire directly to bus studs or lugs. Windings shall be continuous with no splices.

D. Core
   1. Manufacture core from a high-grade, non-aging 29 gauge silicon steel with high magnetic permeabilities, low hysteresis and eddy current losses. Keep magnetic flux densities well below saturation to allow for a minimum of 10 percent over-voltage excitation.
   2. Cut laminations with the direction of the grain and free from burrs. All laminations must be core plated or annealed and firmly butted. The core laminations shall be clamped tightly and compressed to provide quiet operation and to prevent damage during shipment or rough handling.

E. Taps: Provide NEMA Standard taps.

F. Enclosures
   1. Provide lifting brackets on all sizes.
   2. Ventilated openings shall be such as to avoid accidental access to live parts.
   3. Degrease, clean, phosphatize and paint the entire enclosure with one (1) coat of zinc chromate primer and two (2) coats of gray enamel.

G. The core and coil assembly shall be grounded to the enclosure by means of a flexible copper grounding strap of adequate size.

H. Mounting
   1. Provide transformers up to and including 112-1/2 KVA suitable for floor, wall or ceiling mounting.

I. Vibration Isolation
   1. Core and coil assemblies 30 KVA and larger to be mounted on rubber vibration isolators designed specifically to reduce 120 Hz sound and multiple harmonics.

J. All transformers shall be of the quiet type, operating at sound levels substantially below ANSI standards as follows:

Size in KVA	Specification	ANSI Standard
0-5	33	40
6-9	37	40
10-25	40	45
26-50	45	45
51-150	45	50
151-225	45	55
226-300	48	55
301-500	55	60

PART 3 - EXECUTION

3.1 GENERAL

A. Where indicated or as otherwise required and/or approved, resiliently suspend each dry type transformer on double deflection neoprene in the shear hanger rod isolator assemblies, capable of providing minimum 3/8 inch static deflection.

B. Where transformers are to be floor mounted install on 4" high concrete housekeeping pads. Provide neoprene pads between transformer stand and housekeeping pad.

C. Provide grounding conductor from transformer secondary to nearest building ground for each separately derived system. Grounding electrode conductor shall be sized in accordance with NEC Section 250-94 for the derived phase conductors.

D. Flexible conduit shall be used for all conduit connections to transformers; provide external bonding wire.

E. Adjust transformer taps for rated output voltage under normal operating conditions.

-- End of Section --