SECTION 26 22 00 - TRANSFORMERS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Provide dry-type energy efficient transformers per NEMA TP1, with primary and secondary voltages of 600V and less and capacity ratings 15kVA through 750kVA.as specified herein and where shown on the Drawings.

1.2 SUBMITTAL AND RECORD DOCUMENTATION

A. Submit shop drawings indicating outline dimensions, connection and support points, weight, specified ratings, and materials. Include wiring diagrams of products, differentiating between manufacturer-installed and field-installed wiring.

1.3 STANDARDS

A. Transformers 750kVA and smaller shall be listed by Underwriters Laboratories.

B. Conform to the requirements of ANSI/NFPA 70.

C. Transformers are to be manufactured and tested in accordance with NEMA ST20.

D. Transformers losses shall conform to NEMA TP1 requirements

E. Transformers losses shall be tested in accord with NEMA TP2 procedures

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Acme, Siemens, Square D, Cutler-Hammer/Westinghouse, GE.

2.2 RATINGS INFORMATION

A. All insulating materials are to exceed NEMA ST20 standards and be rated for 220^{o}C UL component recognized insulation system.

B. Transformers 15kVA and larger shall be 150^{o}C temperature rise above 40^{o}C ambient. Transformers 25kVA and larger shall have a minimum of 4 - 2.5% full capacity primary taps. Exact voltages to be as designated on the plans or the transformer schedule.

C. The maximum temperature of the top of the enclosure shall not exceed 50^{o}C rise above a 40^{o}C ambient.

D. Transformers shall be low loss type with minimum efficiencies per NEMA TP1 when operated at 35% of full load capacity. Efficiency shall be tested in accord with NEMA TP2.

Single Phase		Three Phase	
kVA	Efficiency	kVA	Efficiency
15	97.7%	15	97.0%
25	98.0%	30	97.5%
37.5	98.2%	45	97.7%
50	98.3%	75	98.0%
75	98.5%	112.5	98.2%
100	98.6%	150	98.3%
167	98.7%	225	98.5%
250	98.8%	300	98.6%
333	98.9%	500	98.7%
		750	98.8%

E. The transformer(s) shall be rated as indicated on the drawings:

F. Provide weather-shields on transformers exposed to weather.

2.3 CONSTRUCTION

A. Transformer coils shall be of the continuous wound construction and shall be impregnated with nonhygroscopic, thermosetting varnish

B. All cores to be constructed with low hysteresis and eddy current losses. Magnetic flux densities are to be kept well below the saturation point to prevent core overheating. Cores for transformers greater than 500kVA shall be clamped utilizing insulated bolts through the core laminations to ensure proper pressure throughout the length of the core. The completed core and coil shall be bolted to the base of the enclosure but isolated by means of rubber vibration-absorbing mounts. There shall be no metal-to-metal contact between the core and coil and the enclosure except for a flexible safety ground strap. Sound isolation systems requiring the complete removal of all fastening devices will not be acceptable.

C. The core of the transformer shall be visibly grounded to the enclosure by means of a flexible grounding conductor sized in accordance with applicable UL and NEC standards.

D. The transformer enclosures shall be ventilated and be fabricated of heavy gauge, sheet steel construction The entire enclosure shall be finished utilizing a continuous process consisting of degreasing, cleaning and phosphatizing, followed by electrostatic deposition of polymer polyester powder coating and baking cycle to provide uniform coating of all edges and surfaces. The coating shall be UL recognized for outdoor use. The coating color shall be ANSI 49.

2.4 SOUND LEVELS

A. Sound levels shall be warranted by the manufacturer not to exceed the following:

15 to 50KVA - 45dB; 51 to 150kVA - 50dB; 151 to 300kVA - 55dB; 301 to 500kVA - 60dB; 501 to 700kVA - 62dB; 701 to 1000kVA - 64dB; 1001 to 1500kVA - 65dB; 1501 to 2000kVA- 66dB

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install all transformers, make flexible conduit connections to housing, make all cable connections, make ground wire connections.

B. Mount transformers on rubber sound/vibration isolators provided by manufacturer. Use mounting hardare and install according to manufacturer's instructions.

C. No rigid connections shall be made to transformer.

D. Provide support and bracing for transformers to comply with seismic requirements of the area.

E. Leave a minimum clearance of 6" between transformer enclosure and non-combustible surfaces, and a minimum clearance of 12" between transformer enclosure and combustible surfaces.

END OF SECTION