PART 1 - GENERAL

1.1 REFERENCES

.1 CAN/CSA-C802.2-2012, Minimum Efficiency Values for Dry-Type Transformers.

.2 DOE 10 CFR Part 431, Efficiency Standards.

1.2 SHOP DRAWINGS AND PRODUCT DATA

.1 Submit product data in accordance with Section 01 33 00.

.2 Indicate on shop drawings:
.1 Anchoring method and foundation template.
.2 Dimensioned cable entry and exit locations.
.3 Enclosure details including overall length, height and depth.
.4 Efficiency under linear and non-linear load profile up to K20 at 35%, 50%, 65% and 100% loading.
.5 Sound level in decibels.

1.3 OPERATIONS & MAINTENANCE DATA

.1 Provide operations and maintenance data for transformers for incorporation into manual as specified in Section 01 78 00.

PART 2 - PRODUCTS

2.1 TRANSFORMERS

.1 Use transformers of one manufacturer throughout project.

.2 Transformers must exceed energy efficiencies as outlined in CAN/CSA-C802.2 and DOE 10 CFR Part 431.

.3 Design 1 Harmonic Mitigating:
.1 Type: dry.
.2 3 phase, kVA as indicated, 600 V input, 120/208 V output, 60 Hz.
.3 Voltage taps: 2.5% - 2FCAN, 2 FCBN (95%, 97.5%, 100%, 102.5% and 105%).
.4 Insulation: Class H, 130°C temperature rise.
.5 Secondary Neutral: rated 200° of rated phase current.
.6 Basic Impulse Level (BIL): standard.
.7 Hipot: standard.
.8 Average sound level: standard.
.9 Impedance at 170°C: standard.

2.1 TRANSFORMERS (Cont'd)

.3 Design 1 Harmonic Mitigating:(Cont'd)
.10 Enclosure: NEMA Type 2, ventilated removable metal front panel and hood, sprinkler proof.
.11 Mounting: as indicated.
.12 Finish: in accordance with Section 26 05 00.
.13 Impregnation: vacuum impregnated core and coils.
.14 Excitation current: 5% of full load current rating max.
.15 Electrostatic shielding:
.1 60dB common mode electrical noise attenuation.
.2 10dB transverse mode electrical noise attenuation.
.16 K-rating: K13.
.17 Harmonics:
.1 Treat 3rd, 9th and 15th harmonics and other zero sequence currents within the secondary windings.
.2 Treat 5th, 7th, 17th and 19th harmonics with an appropriate primary-secondary phase shift.
.3 Harmonic mitigation to be by electromagnetic means only. Do not use capacitors or electronics.
.18 Winding configuration: Delta primary, single grounded Y secondary. All windings must be copper.
.19 Phase shift: -45°, -30°, -15° or 0° as indicated.
.20 Warranty: ten (10) years.
.21 Options:
.1 Vibration isolators.
.2 Dual rated spade type transformer lug for ground/bonding of transformers.

2.2 ACCEPTABLE MATERIALS

.1 Acceptable material:
.1 Hammond HPS Super Centurion or approved equivalent.
.2 Delta.
.3 Powersmith.
.4 The listing of specific manufacturers above does not imply acceptance of their products that do not meet the specified ratings, features and functions. Manufacturers listed above are not relieved from meeting these specifications in their entirety. Products in compliance with the specification and manufactured by others not named will be considered only if pre-approved by the Departmental Representative.

2.3 EQUIPMENT IDENTIFICATION

.1 Provide equipment identification in accordance with Section 26 05 00.

.2 Label size: 9.

PART 3 - EXECUTION

3.1 INSTALLATION

.1 Securely mount dry type transformer on concrete housekeeping pad or on wall as indicated. Refer to drawings for mounting details. Where transformers do not have internal vibration isolators, provide external vibration isolators on transformer support channels at each of the four corners and between the transformer enclosure legs and floor or support structure.
.1 Acceptable material: Vibro-Acoustics RM Series, size as required.

.2 Transformers containing electrical termination points located on both front and rear sides of same are not acceptable.

.3 Provide adequate clearance around transformer for ventilation in accordance with the Canadian Electrical Code and Electrical Inspection department.

.4 Install transformers in level upright position.

.5 Remove shipping supports only after transformer is installed and just before putting into service.

.6 Loosen isolation pad bolts until no compression is visible.

.7 Megger both primary and secondary windings with 1000 V and 500 V megger as recommended by the manufacturer and report immediately any reading below 100 megohms. Submit test results for Departmental Representative's review and approval and include in O&M Manual.

.8 Measure primary and secondary voltages and record in the O&M Manual. Adjust taps as required.

.9 Confirm transformer is on the correct tap. Record tap settings and include in O&M Manual.

.10 Add lugs for copper conductors when double neutrals are used.

.11 All dry type transformers are to be complete with a Dual Rated Spade Type Transformer Lug, sized as

3.1 INSTALLATION (Cont'd)

.11 (Cont'd)
required to facilitate both grounding and bonding conductor requirements.
.1 Bolt directly to transformer enclosure (chassis) with a minimum of two 12 mm bolts, flat and lock washers and accompanying nuts etc.
.2 To contain number of termination openings as necessary to ensure individual terminations of "each" ground and "each" bond conductor(s) is achieved.

.12 Make primary and secondary connections in accordance with wiring diagram.

.13 Energize transformers after installation and testing is complete.

.14 Demonstrate temperature rise with non-linear K13 load.

.15 Record no load and full load losses in watts.

.16 For transformers mounted above the floor, construct a support structure from galvanized structural steel channel, painted to match wall colour.

END