PART 1 - GENERAL

1.1 SECTION INCLUDES

.1 Materials and components for dry type transformers up to 600 V primary, equipment identification and transformer installation.

1.2 RELATED SECTIONS

.1 Section 26 05 00 - Common Work Results - for Electrical.

1.3 REFERENCES

.1 Canadian Standards Association (CSA International)
.1 CAN/CSA-C22.2 No.47-M90(R2007), Air-Cooled Transformers (Dry Type).
.2 CSA C9-02(R2011), Dry-Type Transformers.
.3 CAN/CSA C802.2-06(R2011), Minimum Efficiency Values for Dry-Type Transformers.
.4 CSA C22.1-12, Canadian Electrical Code, Part 1 (22nd Edition), Safety Standard for Electrical Installations.

1.4 PRODUCT DATA

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

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 20.

PART 2 - PRODUCTS

2.1 TRANSFORMERS

.1 Use transformers of one manufacturer throughout project and in accordance with CAN/CSA-C22.2 No.47, CSA C9 and CSA C802.2.

.2 Design TX1.
.1 Ventilated: Type ANN.
.2 3 phase, 3 winding, 600 V delta primary, 120/208 V grounded Wye secondary, 60 Hz.
.3 Rating: 225 kVA
.4 Voltage taps: four 2½% primary taps (2FCAN, 2FCBN) brought out to a terminal board.

2.1 TRANSFORMERS (Cont'd)

.2 (Cont'd)

.5 Insulation: Class 220, 150 degrees C average temperature rise.
.6 Basic Impulse Level (BIL): standard.
.7 Hipot: standard.
.8 Windings: copper.
.9 The core and coil shall be isolated from the enclosure to reduce noise and vibration by means of neoprene rubber or isomode vibration dampening effect based on the weight of the core and coil unit.
.10 Finish: in accordance with Section 26 05 00.
.11 Average sound level: standard.
.12 Impedance at 17 degrees C: standard.
.13 Enclosure: CSA Type 1, complete with sprinkler-proof hoods.
.14 Transformers shall be manufactured and tested (production tests) in accordance with CSA C802.2 incorporating modifications as specified herein.

.3 Design TX2.
.1 Ventilated: Type ANN.
.2 3 phase, 3 winding, 600 V delta primary, 120/208 V grounded Wye secondary, 60 Hz.
.3 Rating: 45 kVA
.4 Voltage taps: four 2½% primary taps (2FCAN, 2FCBN) brought out to a terminal board.
.5 Insulation: Class 220, 150 degrees C average temperature rise.
.6 Basic Impulse Level (BIL): standard.
.7 Hipot: standard.
.8 Windings: copper (K factor of 13).
.9 The core and coil shall be isolated from the enclosure to reduce noise and vibration by means of neoprene rubber or isomode vibration dampening effect based on the weight of the core and coil unit.
.10 Finish: in accordance with Section 26 05 00.
.11 Average sound level: standard.
.12 Impedance at 17 degrees C: standard.
.13 Enclosure: CSA Type 1, complete with sprinkler-proof hoods.
.14 Transformer shall be specifically dsigned to supply 100% of the 60 Hz fundamental rated current.
.1 33% of the fundamental current as third harmonic.
.2 20% of the fundamental current as fifth harmonic.
.3 14% of the fundamental current as seventh harmonic.

2.1 TRANSFORMERS (Cont'd)

.3 (Cont'd)

.14 (Cont'd)

.4 11% of the fundamental current as ninth harmonic.

.5 Lower proportional percentages of the fundamental current through the 25th harmonic. Mark transformers with a label stating "Suitable for Non-Sinusoidal Current Load with K-Factor not to exceed 13".

.15 The core flux density shall be well below the saturation point to prevent core saturation caused by the harmonic even with a 10% primary overvoltage. The transformer core shall be constructed of grain oriented M6 or better; high grade non-aging silicon steel laminations of the mitre type construction.

.16 Transformers shall be manufactured and tested (production tests) in accordance with CSA C802.2 incorporating modifications as specified herein.

.4 Design TX3.

.1 Ventilated: Type ANN.

.2 3 phase, 3 winding, 600 V delta primary, 120/208 V grounded Wye secondary, 60 Hz.

.3 Rating: 15 kVA

.4 Voltage taps: four 2½% primary taps (2FCAN, 2FCBN) brought out to a terminal board.

.5 Insulation: Class 220, 150 degrees C average temperature rise.

.6 Basic Impulse Level (BIL): standard.

.7 Hipot: standard.

.8 Windings: copper.

.9 The core and coil shall be isolated from the enclosure to reduce noise and vibration by means of neoprene rubber or isomode vibration dampening effect based on the weight of the core and coil unit.

.10 Finish: in accordance with Section 26 05 00.

.11 Average sound level: standard.

.12 Impedance at 17 degrees C: standard.

.13 Enclosure: CSA Type 1, complete with sprinkler-proof hoods.

.14 Transformers shall be manufactured and tested (production tests) in accordance with CSA C802.2 incorporating modifications as specified herein.

2.2 EQUIPMENT IDENTIFICATION

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

.2 Label size: 7.

.3 Label wording: to match identification provided in Single Line Diagram.

PART 3 - EXECUTION

3.1 INSTALLATION

.1 Mount dry type transformers on floor, unless otherwise noted.

.2 Ensure adequate clearance around transformer for ventilation.

.3 Install transformers in level upright position.

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

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

.6 Make primary and secondary connections in accordance with wiring diagram. Conductors shall not enter the transformer through the top of the enclosure.

.7 Make flexible conduit connections on both primary and secondary sides of all transformers.

.8 Ground transformer in accordance with CSA C22.1.

.9 Energize transformers after installation is complete.

.10 Provide seismic support and restraint for all new transformers.

END