PART 1 - GENERAL

1.2 SUMMARY

1. DISTRIBUTI

A. PRODUCT DAT/

TRANSFORMER INDICATED.

FIELD CONNECTION.

1.4 CLOSEOUT SUBMITTALS

A. OPERATION AND MAINTENANCE DATA: FOR TRANSFORMERS TO INCLUDE IN EMERGENCY, OPERATION, AND MAINTENANCE MANUALS.

1.5 QUALITY ASSURANCE

MANUFACTURER.

FOR INTENDED USE. C. COMPLY WITH IEEE C57.12.91, "TEST CODE FOR DRY-TYPE DISTRIBUTION AND POWER TRANSFORMERS."

PART 2 - PRODUCTS

2.1 MANUFACTURERS

FOLLOWING:

2. SQUARE D; SCHNEIDER ELECTRIC.

2.2 GENERAL TRANSFORMER REQUIREMENTS

2. COIL MATERIAL: ALUMINUM.

2.3 DISTRIBUTION TRANSFORMERS

B. CORES: ONE LEG PER PHASE.

C. ENCLOSURE: VENTILATED, NEMA 250, TYPE 2.

1. FINISH COLOR: ANSI 49 GRAY.

TAPS BELOW NORMAL FULL CAPACITY.

H. INSULATION CLASS: 220 DEG C, UL-COMPONENT-RECOGNIZED INSULATION SYSTEM WITH A MAXIMUM OF 150 DEG C RISE ABOVE 40 DEG C AMBIENT TEMPERATURE.

2.4 IDENTIFICATION DEVICES

- - 2.5 SOURCE QUALITY CONTROL

SECTION 262200

LOW-VOLTAGE TRANSFORMERS

| 1.1 | RELATED DOCUMENTS | 3.1 | EX/ | AMINATION |
|-----|--|-----|-----|---|
| | A. DRAWINGS AND GENERAL PROVISIONS OF THE CONTRACT APPLY TO THIS SECTION. | | A. | EXAMINE CC FOR EACH T |
| 1.2 | SUMMARY | | В. | VERIFY THAT NFPA 70 AND |
| | | | C. | EXAMINE WA |
| | A. THIS SECTION INCLUDES THE FOLLOWING TYPES OF DRY-TYPE TRANSFORMERS RATED 600 V AND LESS, WITH CAPACITIES UP TO 1000 KVA: | | | TRANSFORM |
| | 1. DISTRIBUTION TRANSFORMERS. | | D. | VERIFY THAT AND BONDIN OHMS AT LO |
| 1.3 | ACTION SUBMITTALS | | E. | PROCEED W |
| | A. PRODUCT DATA: INCLUDE RATED NAMEPLATE DATA, CAPACITIES, WEIGHTS, DIMENSIONS, MINIMUM CLEARANCES, INSTALLED DEVICES AND FEATURES, AND PERFORMANCE FOR EACH TYPE AND SIZE OF | 3.2 | INS | TALLATION |

B. SHOP DRAWINGS: DETAIL EQUIPMENT ASSEMBLIES AND INDICATE DIMENSIONS, WEIGHTS, LOADS, REQUIRED CLEARANCES, METHOD OF FIELD ASSEMBLY, COMPONENTS, AND LOCATION AND SIZE OF EACH

1. WIRING DIAGRAMS: POWER, SIGNAL, AND CONTROL WIRING.

A. SOURCE LIMITATIONS: OBTAIN EACH TRANSFORMER TYPE THROUGH ONE SOURCE FROM A SINGLE

B. ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA 70, ARTICLE 100, BY A TESTING AGENCY ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION, AND MARKED

MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE

1. ACME ELECTRIC CORPORATION; POWER DISTRIBUTION PRODUCTS DIVISION.

A. DESCRIPTION: FACTORY-ASSEMBLED AND -TESTED, AIR-COOLED UNITS FOR 60-HZ SERVICE.

B. CORES: GRAIN-ORIENTED, NON-AGING SILICON STEEL. C. COILS: CONTINUOUS WINDINGS WITHOUT SPLICES EXCEPT FOR TAPS.

1. INTERNAL COIL CONNECTIONS: BRAZED OR PRESSURE TYPE.

A. COMPLY WITH NEMA ST 20, AND LIST AND LABEL AS COMPLYING WITH UL 1561.

1. CORE AND COIL SHALL BE ENCAPSULATED WITHIN RESIN COMPOUND, SEALING OUT MOISTURE AND

D. TRANSFORMER ENCLOSURE FINISH: COMPLY WITH NEMA 250.

E. TAPS FOR TRANSFORMERS SMALLER THAN 3 KVA: NONE.

F. TAPS FOR TRANSFORMERS 7.5 TO 24 KVA: TWO 5 PERCENT TAPS BELOW RATED VOLTAGE.

G. TAPS FOR TRANSFORMERS 25 KVA AND LARGER: TWO 2.5 PERCENT TAPS ABOVE AND FOUR 2.5 PERCENT

I. ENERGY EFFICIENCY FOR TRANSFORMERS RATED 15 KVA AND LARGER: 1. COMPLYING WITH 2016 DEPARTMENT OF ENERGY STANDARDS.

2. TESTED ACCORDING TO NEMA TP 2.

J. LOW-SOUND-LEVEL REQUIREMENTS: MINIMUM OF 3 DBA LESS THAN NEMA ST 20 STANDARD SOUND LEVELS WHEN FACTORY TESTED ACCORDING TO IEEE C57.12.91.

A. NAMEPLATES: ENGRAVED, LAMINATED-PLASTIC OR METAL NAMEPLATE FOR EACH DISTRIBUTION TRANSFORMER, MOUNTED WITH CORROSION-RESISTANT SCREWS. NAMEPLATES AND LABEL PRODUCTS ARE SPECIFIED IN SECTION 260553 "IDENTIFICATION FOR ELECTRICAL SYSTEMS."

A. TEST AND INSPECT TRANSFORMERS ACCORDING TO IEEE C57.12.91.

B. FACTORY SOUND-LEVEL TESTS: CONDUCT SOUND-LEVEL TESTS ON EQUIPMENT FOR THIS PROJECT.

PART 3 - EXECUTION

ONDITIONS FOR COMPLIANCE WITH ENCLOSURE- AND AMBIENT-TEMPERATURE REQUIREMENTS RANSFORMER.

- T FIELD MEASUREMENTS ARE AS NEEDED TO MAINTAIN WORKING CLEARANCES REQUIRED BY D MANUFACTURER'S WRITTEN INSTRUCTIONS.
- ALLS, FLOORS, ROOFS, AND CONCRETE BASES FOR SUITABLE MOUNTING CONDITIONS WHERE MERS WILL BE INSTALLED.
- T GROUND CONNECTIONS ARE IN PLACE AND REQUIREMENTS IN SECTION 260526 "GROUNDING NG FOR ELECTRICAL SYSTEMS" HAVE BEEN MET. MAXIMUM GROUND RESISTANCE SHALL BE 5 DCATION OF TRANSFORMER.
- VITH INSTALLATION ONLY AFTER UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.
- A. CONSTRUCT CONCRETE BASES AND ANCHOR FLOOR-MOUNTING TRANSFORMERS ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS, SEISMIC CODES APPLICABLE TO PROJECT, AND REQUIREMENTS IN SECTION 260529 "HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS."
- 3.3 CONNECTIONS A. GROUND EQUIPMENT ACCORDING TO SECTION 260526 "GROUNDING AND BONDING FOR ELECTRICAL
- SYSTEMS." B. CONNECT WIRING ACCORDING TO SECTION 260519 "LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES."

3.4 FIELD QUALITY CONTROL

- A. TESTS AND INSPECTIONS:
- 1. PERFORM EACH VISUAL AND MECHANICAL INSPECTION AND ELECTRICAL TEST STATED IN NETA ACCEPTANCE TESTING SPECIFICATION. CERTIFY COMPLIANCE WITH TEST PARAMETERS.
- B. REMOVE AND REPLACE UNITS THAT DO NOT PASS TESTS OR INSPECTIONS AND RETEST AS SPECIFIED ABOVE.
- C. TEST LABELING: ON COMPLETION OF SATISFACTORY TESTING OF EACH UNIT, ATTACH A DATED AND SIGNED "SATISFACTORY TEST" LABEL TO TESTED COMPONENT.

3.5 ADJUSTING

- A. RECORD TRANSFORMER SECONDARY VOLTAGE AT EACH UNIT FOR AT LEAST 48 HOURS OF TYPICAL OCCUPANCY PERIOD. ADJUST TRANSFORMER TAPS TO PROVIDE OPTIMUM VOLTAGE CONDITIONS AT SECONDARY TERMINALS. OPTIMUM IS DEFINED AS NOT EXCEEDING NAMEPLATE VOLTAGE PLUS 10 PERCENT AND NOT BEING LOWER THAN NAMEPLATE VOLTAGE MINUS 3 PERCENT AT MAXIMUM LOAD CONDITIONS. SUBMIT RECORDING AND TAP SETTINGS AS TEST RESULTS.
- B. CONNECT BUCK-BOOST TRANSFORMERS TO PROVIDE NAMEPLATE VOLTAGE OF EQUIPMENT BEING SERVED, PLUS OR MINUS 5 PERCENT, AT SECONDARY TERMINALS.
- C. OUTPUT SETTINGS REPORT: PREPARE A WRITTEN REPORT RECORDING OUTPUT VOLTAGES AND TAP SETTINGS.

3.6 CLEANING

A. VACUUM DIRT AND DEBRIS; DO NOT USE COMPRESSED AIR TO ASSIST IN CLEANING.

END OF SECTION 262200

SECTION 262416

PANELBOARDS

PART 1 - GENERAL

- 1.1 GENERAL
 - A. THE PROVISIONS OF SECTION 260500, GENERAL REQUIREMENTS FOR ELECTRICAL WORK, APPLY TO THE WORK OF THIS SECTION.
- 1.2 CODES AND STANDARDS
 - A. PRODUCTS SHALL COMPLY WITH THE FOLLOWING CODES AND STANDARDS AND SHALL BE UL_LISTED AND LABELED:
 - NEMA AB-1 MOLDED CASE CIRCUIT BREAKERS
 - NEMA PB-1 PANELBOARDS UL 50 ENCLOSURES FOR ELECTRICAL EQUIPMENT
 - UL 67 PANELBOARDS UL 489 MOLDED CASE CIRCUIT BREAKERS AND CIRCUIT BREAKER ENCLOSURES
- 1.3 SUBMITTALS
 - A. MANUFACTURER'S PRODUCT DATA SHEETS.
 - B. CIRCUIT BREAKER SCHEDULES.
 - C. DIMENSIONED PLANS, ELEVATIONS, SECTIONS AND DETAILS.
- 1.4 MANUFACTURERS
 - A. SUBJECT TO COMPLIANCE WITH THE REQUIREMENTS OF THIS SECTION:
 - SQUARE D
 - GE SEIMENS
 - CUTLER HAMMER
- PART 2 PRODUCTS
- 2.1 GENERAL
 - A. PANELBOARDS SHALL BE OF THE SIZES, RATING AND ARRANGEMENT SHOWN ON THE DRAWINGS.
 - B. PANELBOARDS SHALL BE PROVIDED COMPLETE WITH ALL OVERCURRENT DEVICES, ACCESSORIES AND TRIM.
 - C. ALL PANELBOARDS SHALL BE PROVIDED WITH SAFETY BARRIERS FOR DEAD FRONT CONSTRUCTION.
 - D. THE REQUIRED SHORT CIRCUIT RATINGS OF ASSEMBLED PANELBOARDS ARE SHOWN ON THE DRAWINGS. THE SHORT CIRCUIT RATING OF EVERY OVERCURRENT DEVICE IN THE PANEL SHALL MEET OR EXCEED THE PANEL RATING. UNLESS OTHERWISE NOTED ON THE DRAWINGS, SERIES RATED COMBINATIONS WILL NOT BE PERMITTED.
 - E. PROVIDE THROUGH-FEED OR SUB-FEED LUGS AS INDICATED ON PANEL SCHEDULES.
- 2.2 CABINETS
 - A. BOXES SHALL BE CODE GAUGE GALVANIZED SHEET STEEL.
 - B. TRIM SHALL BE CODE GAUGE STEEL, ANSI-61 GRAY FINISH WITH STAINLESS STEEL FLUSH TYPE LOCK/LATCH HANDLE. ALL LOCKS SHALL BE KEYED ALIKE.
 - C. TRIM FOR SURFACE MOUNTED PANELS SHALL BE DOOR-IN-DOOR CONSTRUCTION SUCH THAT THE GUTTER SPACE MAY BE EXPOSED BY A HINGED DOOR.
 - D. DIRECTORY FRAMES SHALL BE METAL FRAME WITH PLASTIC COVERS.
- 2.3 BUS
 - A. ALL BUS WORK SHALL BE COPPER.

CONDUCTORS.

- B. NEUTRAL BUSSES SHALL BE 100% RATED WITH ADEQUATE CONNECTIONS FOR ALL OUTGOING NEUTRAL
- C. PANELBOARDS SHALL BE PROVIDED WITH COPPER GROUND BUSSES.
- D. BUS SHALL BE DESIGNED FOR SEQUENCE PHASE CONNECTION TO ALLOW THE INSTALLATION OF ONE, TWO OR THREE POLE BRANCH CIRCUIT BREAKERS IN ANY POSITION.
- 2.4 OVERCURRENT DEVICES
 - A. OVERCURRENT DEVICES SHALL BE TRIP-FREE MOLDED CASE, BOLT-ON, THERMAL-MAGNETIC CIRCUIT BREAKERS.
 - B. MAIN CIRCUIT BREAKERS SHALL BE INDIVIDUALLY MOUNTED AND BOLTED TO BUS ASSEMBLY. BACK-FED BRANCH MOUNTED CIRCUIT BREAKERS ARE PROHIBITED.
 - C. FRONT FACES OF ALL CIRCUIT BREAKERS SHALL BE FLUSH. TRIP INDICATION SHALL BE CLEARLY SHOWN BY THE HANDLE POSITION BETWEEN THE ON AND OFF POSITIONS.
 - D. GROUND FAULT AND ARC FAULT CIRCUIT BREAKERS SHALL REQUIRE NO MORE PANEL SPACE THAN STANDARD BREAKERS.
 - E. ALL CONNECTIONS SHALL BE RATED FOR 75° C COPPER CONDUCTORS.
- PART 3 EXECUTION
- 3.1 PANELBOARDS
 - A. PANELBOARDS SHALL BE PROVIDED WITH A LABEL THAT INDICATES PANELBOAD NAME, VOLTAGE, AMPERAGE AND ELECTRICAL DISTRIBUTION EQUIPMENT THAT THE PANELBOARD IS FED FROM.
 - B. PANELBOARD COVERS ARE REQUIRED TO HAVE 2 LABELS. THE FIRST, AN ARC FLASH WARNING LABEL AND THE SECOND, AN OSHA LABEL REQUIRING 3 FEET, (3 FEET 6 INCHES OR 4 FEET AS APPLICABLE), CLEARANCE IN FRONT OF THE PANEL.

END OF SECTION 262416

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