AS DESCRIBED ABOVE AND/OR DETAILED ON THE ENGINEERING DRAWINGS.

J. PROVIDE TYPEWRITTEN DIRECTORIES FOR NEW AND EXISTING PANELS. CONFIRM EXISTING IDENTIFICATION AND CORRECT WHERE NECESSARY.

3.19 EXISTING EQUIPMENT REFURBISHMENT:

A. WHERE PANELBOARDS, SWITCHES, CIRCUIT BREAKERS, TRANSFORMERS, ETC. ARE EXISTING TO BE REUSED THE CONTRACTOR SHALL CLEAN AND REFURBISH THE EQUIPMENT. THIS SHALL INCLUDE TIGHTENING ALL CONNECTIONS, REPLACING DEFECTIVE MECHANISMS, EXERCISING MECHANISMS AND PROVIDING ANY MISCELLANEOUS COMPONENTS SO THE EQUIPMENT IS IN FIRST CLASS WORKING ORDER.

B. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE TO FIELD SURVEY ALL EXISTING BASE BUILDING RECEPTACLE, LIGHTING AND EQUIPMENT CIRCUITS WHICH ARE EXISTING TO REMAIN, PROVIDE AS BUILT SURVEY PRIOR TO THE START OF ANY WORK AND SUBMIT TO ENGINEER FOR RECORD. CIRCUITS SHALL REMAIN IN EXISTING PANELS OR WHEN PANELBOARDS ARE REPLACED, RE-TERMINATED IN NEW PANELBOARD.

3.20 ELECTRICAL FURNITURE SYSTEMS

A. THE ELECTRIFIED FURNITURE VENDOR WILL SUPPLY ALL RECEPTACLES, FURNITURE TASK LIGHTING FIXTURES, WIRING HARNESSES, CONNECTORS AND FITTINGS TO THE ELECTRICAL CONTRACTOR FOR THE COMPLETE WIRING INSTALLATION. ALL WIRING AND COMPONENTS SHALL BE INSTALLED AS DIRECTED BY VENDOR. ELECTRICAL CONTRACTOR SHALL FURNISH AN 18" MAXIMUM LIQUID TIGHT FLEXIBLE CONDUIT CONNECTIONS WITH REQUIRED PHASE CONDUCTORS, NEUTRAL CONDUCTORS AND GROUND CONDUCTORS AS INDICATED FROM WALL OR FLOOR OUTLET.

B. THE FURNITURE VENDOR SHALL CHALK THE FURNITURE SYSTEM OUTLINE ON THE FLOOR FOR COORDINATION OF POWER AND COMMUNICATION IN-FEED LOCATIONS. IN-FEED LOCATIONS INDICATED ON PLAN DOCUMENTS ARE FOR CLARITY PURPOSES. IN-FEED LOCATIONS AND QUANTITY SHALL BE APPROVED IN FIELD BY ARCHITECT AND FURNITURE SYSTEM VENDOR PRIOR TO INSTALLATION.

C. FURNITURE SYSTEM CIRCUITRY DESIGN IS DEVELOPED BASED UPON A "2+2" WIRING CONFIGURATION. CONTRACTOR SHALL CIRCUIT 2 PHASE CONDUCTORS, WITH A NEUTRAL FOR CIRCUITS "1&2" AND 2 PHASE CONDUCTORS, WITH A NEUTRAL FOR CIRCUITS "3&4". BOTH PAIRS OF CIRCUITS SHALL BE PROVIDED WITH A GROUND CONDUCTOR. CONTRACTOR SHALL INSTALL 8#10 AWG CONDUCTORS TO EACH FURNITURE SYSTEM INFEED.

D. MULT-FIWIRE BRANCH CIRCUITS SUPPLYING POWER TO PERMANENTLY CONNECTED FREESTANDING PARTITIONS (ELECTRIFIED FURNITURE SYSTEMS) SHALL BE PROVIDED WITH A MEANS TO DISCONNECT SIMULTANEOUSLY ALL UNGROUNDED CONDUCTORS AT THE PANELBOARD WHERE THE BRANCH CIRCUIT ORIGINATES. CONTRACTOR SHALL COORDINATE WITH LOCAL AHJ THE MEANS REQUIRED TO MEET NEC SECTIONS 605.7.

3.21 LIFE SAFETY TESTING

A. AFTER COMPLETION OF THE PROJECT, PERFORM A TEST OF THE EMERGENCY EGRESS LIGHTING SYSTEM. TEST SHALL BE PERFORMED AFTER DARK (AT LEAST 1 HOUR AFTER SUNSET); SIMULATE POWER FAILURE ON ALL LIGHTING CIRCUITS. TAKE LIGHT LEVEL READINGS ALONG PATHS OF EGRESS AT FLOOR LEVEL UTILIZING A FOOT CANDLE METER; RECORD READINGS ON A REDUCED SCALE (1/16"=1'-0") FLOOR PLAN. READINGS SHALL BE TAKEN ALONG THE ENTIRE EGRESS PATH, AND THE AVERAGE, MINIMUM, AND MAX TO MIN RATIO SHALL BE RECORDED. SUBMIT SEALED AND SIGNED COPY OF THE FLOOR PLAN READINGS TO THE ENGINEER.

3.22 WARNING LABELS

A. SWITCHBOARDS, PANELBOARDS AND ASSOCIATED EQUIPMENT (UPS, ETC.) THAT WILL REQUIRE ADJUSTMENT, SERVICING, INSPECTION, OR MAINTENANCE WHILE ENERGIZED SHALL BE FIELD MARKED INDICATING VOLTAGE AND WARNING QUALIFIED PERSONS OF POTENTIAL ELECTRIC ARC-FLASH HAZARDS PER NEC SECTION 110.16 AND NFPA 70E. REFER TO SECTION 1.26 FOR ADDITIONAL INFORMATION ON FLASH HAZARD ANALYSIS.

B. SERVICE EQUIPMENT SHLL BE FIELD MARKED INDICATING THE MAXIMUM AVAILABLE FAULT CURRENT IN ACCORDANCE WITH NEC 110.24 (A). CONTRACTOR IS RESPONSIBLE FOR OBTAINING CORRECT VALUES FROM THE UTILITY COMPANY.

3.23 PROTECTION

A. CONTRACTOR SHALL BE RESPONSIBLE FOR WORK AND EQUIPMENT UNTIL FINALLY INSPECTED, TESTED AND ACCEPTED. MATERIALS AND EQUIPMENT SHALL BE CAREFULLY STORED WHICH ARE NOT IMMEDIATELY INSTALLED AFTER DELIVERY TO SITE. CLOSE EXPOSED PARTS OF THE WORK WITH TEMPORARY COVERS, OR PLUGS DURING CONSTRUCTION, TO PREVENT ENTRY OF MOISTURE OR OBSTRUCTING MATERIALS.

B. PROTECT THE WORK AND MATERIAL OF OTHERS FROM DAMAGE INSTALLED AS PART OF THIS CONTRACT. RESTORE ANY WORK DAMAGED AND BE RESPONSIBLE FOR ALL CURRENT WORK AND ASSOCIATED COSTS.

3.24 FIELD QUALITY CONTROL

A. INSPECT INSTALLED COMPONENTS FOR DAMAGE AND FAULTY WORK, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:

1. RACEWAYS.
2. BUILDING WIRE AND CONNECTORS.
3. SUPPORTING DEVICES FOR ELECTRICAL COMPONENTS.
4. ELECTRICAL IDENTIFICATION.
5. ELECTRICITY-METERING COMPONENTS.
6. CONCRETE BASES.
7. ELECTRICAL DEMOLITION.
8. CUTTING AND PATCHING FOR ELECTRICAL CONSTRUCTION.
9. TOUCHUP PAINTING.
10. PANELBOARDS.
11. SWITCHBOARDS.
12. AUTOMATIC TRANSFER SWITCHES.

B. TEST OWNER'S ELECTRICITY-METERING INSTALLATION FOR PROPER OPERATION, ACCURACY, AND USABILITY OF OUTPUT DATA.

1. CONNECT A LOAD OF KNOWN KW RATING, 1.5 KW MINIMUM, TO A CIRCUIT SUPPLIED BY THE METERED FEEDER.
2. TURN OFF CIRCUITS SUPPLIED BY THE METERED FEEDER AND SECURE THEM IN THE "OFF" CONDITION.
3. RUN THE TEST LOAD CONTINUOUSLY FOR EIGHT HOURS, MINIMUM, OR LONGER TO OBTAIN A MEASURABLE METER INDICATION. USE A TEST LOAD PLACEMENT AND SETTING THAT ENSURE CONTINUOUS, SAFE OPERATION.
4. CHECK AND RECORD METER READING AT END OF TEST PERIOD AND COMPARE WITH ACTUAL ELECTRICITY USED BASED ON TEST LOAD RATING, DURATION OF TEST, AND SAMPLE MEASUREMENTS OF SUPPLY VOLTAGE AT THE TEST LOAD CONNECTION. RECORD TEST RESULTS.
5. REPAIR OR REPLACE MALFUNCTIONING METERING EQUIPMENT OR CORRECT TEST SETUP; THEN RETEST. REPEAT FOR EACH METER IN INSTALLATION UNTIL PROPER OPERATION OF ENTIRE SYSTEM IS VERIFIED.
6. WITH LOADS APPLIED FOR MINIMUM 20 MINUTES PERFORM AN INFRARED TEST ON EACH WIRE/CABLE CONNECTION POINT AND RECORD RESULTS. PROVIDE AN INFRARED PHOTO ALONGSIDE A NORMAL COLOR PHOTO IN REPORT. SUBMIT TEST REPORT TO OWNER.

3.25 EXTRA MATERIALS:

A. IN ADDITION TO ALL MATERIALS AND INSTALLATION COMPONENTS INDICATED ON THE DRAWINGS, ELECTRICAL CONTRACTOR SHALL PROVIDE THE FOLLOWING (INCLUSIVE OF ALL MATERIAL AND LABOR ASSOCIATED WITH INSTALL):

1. TWENTY-FIVE (25) DUPLEX RECEPTACLES
2. FIVE (5) CEILING MOUNTED OCCUPANCY/VACANCY SENSORS
3. TWELVE (12) 20 AMPERE, 1-POLE BRANCH CIRCUITS CONSISTING OF 100' OF 3#12 IN 3/4" CONDUIT.

3.26 COMMISSIONING:

A. ELECTRICAL SYSTEMS TO BE COMMISSIONED:

1. LIGHTING CONTROL SYSTEM
2. OCCUPANCY/VACANCY SENSORS
3. LIGHTING CONTROL DEVICES

B. ELECTRICAL CONTRACTOR SHALL ASSIST OWNER SELECTED COMMISSIONING AGENT WITH THE COMMISSIONING OF THE LIGHTING CONTROL SYSTEM FOR COMPLIANCE ALL APPLICABLE CODE REQUIREMENTS (I.E. ENERGY CODE, ELECTRICAL CODE, ETC.).

C. ELECTRICAL CONTRACTOR SHALL INCLUDE IN THEIR BASE BID, THE SERVICES OF THE LIGHTING CONTROL SYSTEM AND SENSOR SYSTEM MANUFACTURER'S REPRESENTATIVES TO ATTEND AND ASSIST IN THE FINAL COMMISSIONING OF THE SYSTEMS.

D. COMMISSIONING SHALL ENSURE THAT ALL CONTROL HARDWARE AND SOFTWARE ARE CALIBRATED, ADJUSTED, PROGRAMMED AND IN PROPER WORKING CONDITION IN ACCORDANCE WITH CONSTRUCTION DOCUMENTS AND MANUFACTURER'S INSTALLATION INSTRUCTIONS.

E. COORDINATE ALL WORK ASSOCIATED WITH THE FUNDAMENTAL COMMISSIONING ACTIVITIES, INCLUDING:

1. ATTEND ALL COMMISSIONING MEETINGS WITH ASSOCIATED SUB-CONTRACTORS AND MANUFACTURER'S REPRESENTATIVES THAT ARE REQUIRED TO COMPLETE THE COMMISSIONING OF THE EQUIPMENT PROVIDED.
2. PERFORM AND DOCUMENT TESTING OUTLINED IN THE COMMISSIONING AUTHORITY PROCEDURES.
3. WORK CLOSELY WITH THE COMMISSIONING AUTHORITY IN IDENTIFYING ALL OPERATING, MAINTENANCE, FAILURE MODES THAT MUST BE DEMONSTRATED AS PART OF THE COMMISSIONING PROCESS.
4. COMPLETE PRE-STARTUP AND STARTUP ON ALL INSTALLED EQUIPMENT PRIOR TO ALL COMMISSIONING ACTIVITIES.
5. COORDINATE, SCHEDULE, AND COMPLETE COMMISSIONING TASKS WITH THE COMMISSIONING AUTHORITY. THE ELECTRICAL CONTRACTOR SHALL BE MADE READILY AVAILABLE FOR OPERATING AND TESTING ALL EQUIPMENT TO BE COMMISSIONED.
6. PROVIDE MANUFACTURER ACCEPTABLE TESTING DOCUMENTATION (STARTUP MANUALS) PRIOR TO START OF COMMISSIONING TESTING PROCEDURES.
7. RESPONSIBLE FOR ALL COSTS FOR TESTING, INCLUDING PRE-TESTING DUE TO DEFICIENCIES/NON-COMPLIANCE WITH TESTING/SPECIFICATIONS.
8. RESPONSIBLE TO SUPPLY AND CONNECT ALL TESTING EQUIPMENT REQUIRED FOR ANY PART OF THE COMMISSIONING PROCESS (I.E. LOAD BANKS, CABLES, INFRARED SCANNING, TEMPORARY COOLING MEANS, ETC.).

F. SYSTEM REVIEW SHALL INCLUDE THAT ALL SENSORS, SWITCHES, PROGRAMMED SCHEDULE CONTROLS, PHOTOSENSORS OR DAYLIGHT CONTROLS MEET THE FOLLOWING REQUIREMENTS:

1. COMMISSIONING AGENT SHALL CONFIRM PLACEMENT, SENSITIVITY AND TIME OUT ADJUSTMENTS FOR OCCUPANT SENSORS YIELD ACCEPTABLE PERFORMANCE.
2. COMMISSIONING AGENT SHALL CONFIRM THAT TIME SWITCHES AND PROGRAMMABLE SCHEDULE CONTROLS ARE PROGRAMMED TO TURN OFF LIGHTING
3. COMMISSIONING AGENT SHALL CONFIRM THAT THE PLACEMENT AND SENSITIVITY ADJUSTMENTS FOR PHOTOSENSOR CONTROLS REDUCE ELECTRIC LIGHT BASED ON THE AMOUNT OF USABLE DAYLIGHT IN THE SPACE AS SPECIFIED.

G. ELECTRICAL CONTRACTOR SHALL PRETEST ALL SYSTEMS AND DEVICES AND SHALL SUBMIT A COMPLETION CERTIFICATE FROM THE MANUFACTURER'S REPRESENTATIVE, ON MANUFACTURER'S LETTERHEAD, THAT ALL SYSTEMS ARE OPERATIONAL AND PERFORM TO CONTRACT DOCUMENT SPECIFICATIONS. MANUFACTURER'S CERTIFICATE SHALL BE DELIVERED TO GENERAL CONTRACTOR/ CONSTRUCTION MANAGER, TENANT, AND ENGINEER A MINIMUM OF FIVE (5) DAYS PRIOR TO TENANT MOVE IN.

H. COMMISSIONING OF LIGHTING CONTROL SYSTEM (PROGRAMMABLE SYSTEM CONTROLS, OCCUPANT SENSORS, PHOTOSENSORS, AND DAYLIGHT CONTROLS) SHALL BE READY FOR COMMISSIONING AGENT NO FEWER THAN TEN (10) WORKING DAYS PRIOR TO OWNER TURN-OVER.

MEDIUM VOLTAGE TRANSFORMERS

1. GENERAL

1.1. SCOPE

A. THIS SECTION DEFINES DRY-TYPE, ENCLOSED AND VENTILATED MEDIUM VOLTAGE (POWER) TRANSFORMERS AS INDICATED.

B. TRANSFORMERS SHALL BE DESIGNED, CONSTRUCTED AND RATED IN ACCORDANCE WITH UL, NEMA AND IEEE/ANSI STANDARDS.

C. TRANSFORMERS SHALL BE DESIGNED, CONSTRUCTED AND RATED (WHERE APPLICABLE) IN ACCORDANCE WITH U.S. DEPARTMENT OF ENERGY, ENERGY CONSERVATION PROGRAM FOR COMMERCIAL EQUIPMENT; DISTRIBUTION TRANSFORMERS ENERGY CONSERVATION STANDARDS.

C.1. DOE 2016 - DOE 10 CFR PART 431 EFFICIENCY STANDARDS; PUBLISHED IN THE FEDERAL REGISTER ON APRIL 18, 2013.

1.2. RELATED DOCUMENTS

A. DRAWING AND GENERAL PROVISIONS OF THE CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS AND DIVISION 1 SPECIFICATION SECTIONS, APPLY TO THIS SECTION

1.3 REFERENCES

A. IEEE C57.12.01 - GENERAL REQUIREMENTS FOR DISTRIBUTION, POWER AND REGULATING TRANSFORMERS

B. ANSI C57.12.28 - SWITCHGEAR AND TRANSFORMERS, PAD-MOUNTED EQUIPMENT - ENCLOSURE INTEGRITY

C. ANSI C57.12.50 - REQUIREMENTS FOR VENTILATED DRY-TYPE DISTRIBUTION TRANSFORMERS, 1-500 KVA SINGLE-PHASE AND 15-500 KVA THREE-PHASE, WITH HIGH VOLTAGE 601-34,500 VOLTS, LOW VOLTAGE 120-600 VOLTS

D. ANSI C57.12.51 - REQUIREMENTS FOR VENTILATED DRY-TYPE POWER TRANSFORMERS, 501 KVA AND

E. LARGER THREE-PHASE, WITH HIGH VOLTAGE 601-34,500 VOLTS, LOW VOLTAGE 208Y/120-4160 VOLTS

F. ANSI C57.12.55 - CONFORMANCE STANDARD FOR TRANSFORMERS - DRY-TYPE TRANSFORMERS USED IN UNIT

G. INSTALLATIONS, INCLUDING UNIT SUBSTATIONS

H. IEEE C57.12.56 - STANDARD TEST PROCEDURE FOR THERMAL EVALUATION OF INSULATION SYSTEMS FOR

I. VENTILATED DRY-TYPE POWER AND DISTRIBUTION TRANSFORMERS

J. IEEE C57.12.58 - GUIDE FOR CONDUCTING A TRANSIENT VOLTAGE ANALYSIS OF A DRY-TYPE TRANSFORMER

K. COIL

L. IEEE C57.12.59 - GUIDE FOR DRY-TYPE TRANSFORMER THROUGH-FAULT CURRENT DURATION

M. IEEE C57.12.70 - TERMINAL MARKINGS AND CONNECTIONS FOR DISTRIBUTION AND POWER TRANSFORMERS

N. IEEE C57.12.80 - STANDARD TERMINOLOGY FOR POWER AND DISTRIBUTION TRANSFORMERS

O. IEEE C57.12.91 STANDARD TEST CODE FOR DRY-TYPE DISTRIBUTION AND POWER TRANSFORMERS,

P. IEEE C57.94 - RECOMMENDED PRACTICE FOR INSTALLATION, APPLICATION, OPERATION, AND MAINTENANCE OF DRY-TYPE GENERAL PURPOSE DISTRIBUTION AND POWER TRANSFORMERS

Q. IEEE C57.96 - GUIDE FOR LOADING DRY-TYPE DISTRIBUTION AND POWER TRANSFORMERS (ANSI).

R. IEEE C57.105 - GUIDE FOR APPLICATION OF TRANSFORMER CONNECTIONS IN THREE-PHASE DISTRIBUTION SYSTEMS

S. C57.110 FOR NON-LINEAR LOADS AND C57.18.10 FOR RECTIFIER DUTY IF SPECIFIED

T. IEEE C57.124 - RECOMMENDED PRACTICE FOR THE DETECTION OF PARTIAL DISCHARGES AND THE MEASUREMENT OF APPARENT CHARGE IN DRY-TYPE TRANSFORMERS

U. CSA-C88 - POWER TRANSFORMERS AND REACTORS

V. UL 1562 TRANSFORMERS, DISTRIBUTION, DRY-TYPE - OVER 600 VOLTS

W. DOE 2016 - DOE 10 CFR PART 431 EFFICIENCY STANDARDS; PUBLISHED IN THE FEDERAL REGISTER ON APRIL 18, 2013

X. NEMA 210 - SECONDARY UNIT SUBSTATIONS

Y. NEMA TR-27 - COMMERCIAL, INSTITUTIONAL AND INDUSTRIAL DRY-TYPE TRANSFORMERS

1.4 TESTING & QUALITY CONTROL

A. PRODUCTION TESTS: EACH UNIT ACCORDING TO:

- CSA C9 & C22.2 NO. 47
- UL 1562
- DOE 10 CFR PART 431 SUB PART K

B. TEST EACH MODEL DESIGN AND SUBMIT REPORT ON REQUEST

C. STANDARD PRODUCTION TESTS TO INCLUDE:

- APPLIED POTENTIAL TEST
- INDUCED VOLTAGE TEST
- IMPEDANCE VOLTAGE AND LOAD LOSS TEST
- VOLTAGE RATIO TEST
- NO LOAD AND EXCITATION CURRENT TEST

D. ADDITIONAL TYPE TEST SHOULD BE MADE AVAILABLE ON REQUEST INCLUDE:

- SHORT CIRCUIT TEST
- BIL - BASIC IMPULSE INSULATION LEVEL TEST
- PARTIAL DISCHARGE TEST
- SOUND LEVEL TEST
- TEMPERATURE RISE TEST

1.5 SUBMITALS

A. SUBMIT SHOP DRAWING AND PRODUCT DATA FOR APPROVAL AND FINAL DOCUMENTATION IN THE QUANTITIES LISTED ACCORDING TO THE CONDITIONS OF THE CONTRACT.

A.1. CUSTOMER NAME. CUSTOMER LOCATION AND CUSTOMER ORDER NUMBER SHALL IDENTIFY ALL TRANSMITTALS.

B. PRODUCT DATA INCLUDING KVA RATING, TEMPERATURE RISE, DETAILED ENCLOSURE DIMENSIONS, PRIMARY & SECONDARY NOMINAL VOLTAGES, PRIMARY VOLTAGE TAPS, NO LOAD & FULL LOAD LOSSES, IMPEDANCES, UNIT WEIGHT, WARRANTY; EFFICIENCY (WHERE APPLICABLE) PER DOE 10 CFR PART 431 EFFICIENCY STANDARDS; PUBLISHED IN THE FEDERAL REGISTER ON APRIL 18, 2013.

B.1. SUBMIT MANUFACTURER'S INSTALLATION INSTRUCTIONS.

B.2. UNITS DESTINED FOR THE US BUILT AFTER JANUARY 1ST, 2016, MUST MEET THE NEW DOE 10 CFR PART 431 EFFICIENCY STANDARDS; PUBLISHED IN THE FEDERAL REGISTER ON APRIL 18, 2013 EFFECTIVE AS OF JANUARY 1ST, 2016.

1.6 STORAGE AND HANDLING

A. STORE AND HANDLE IN STRICT COMPLIANCE WITH MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS. PROTECT FROM POTENTIAL DAMAGE FROM WEATHER AND CONSTRUCTION OPERATIONS. STORE SO CONDENSATION WILL NOT FORM ON OR IN THE TRANSFORMER HOUSING AND IF NECESSARY, APPLY TEMPORARY HEAT WHERE REQUIRED TO OBTAIN SUITABLE SERVICE CONDITIONS.

B. HANDLE TRANSFORMER USING PROPER EQUIPMENT FOR LIFTING AND HANDLING, USE WHEN NECESSARY LIFTING EYE AND/OR BRACKETS PROVIDED FOR THAT PURPOSE.

1.7 WARRANTY

A. THE TRANSFORMER SHALL CARRY A 1 YEAR LIMITED WARRANTY.

2. PRODUCTS

2.1. GENERAL CONSTRUCTION:

A. TRANSFORMER CORE SHALL BE MANUFACTURED FROM QUALITY NON-AGING, COLD ROLLED, FULLY PROCESSED SILICON STEEL LAMINATIONS. CORES ARE TO BE PRECISELY CUT TO CLOSE TOLERANCES TO ELIMINATE BURRS AND IMPROVE PERFORMANCE. CORES ARE TO BE CAREFULLY ASSEMBLED AND RIGIDLY HELD SECURE WITH STRUCTURAL STEEL CLAMPS TO MINIMIZE GAPS. GLASS RESIN I BEAMS SHALL BE USED AS BLOCKING COIL SUPPORTS FOR SUPERIOR RESISTANCE TO AXIAL SHORT CIRCUIT FORCES. PRIMARY AND SECONDARY TERMINATIONS TO BE MOUNTED ON SEPARATE INSULATED SUPPORTS.

B. COILS SHALL BE DESIGNED FOR PROPER VENTILATION USING COPPER CONDUCTORS WITH INSULATED COIL SUPPORTS. COILS SHALL BE DISC WOUND ABOVE 5 KV.

C. 220^{O}C INSULATION SYSTEMS BASED ON NOMEX® PAPER (OR EQUIVALENT) SHALL PROVIDE LONG OPERATING LIFE AND QUIET OPERATION. THE COMPLETE CORE AND COIL ASSEMBLY SHALL BE VACUUM PRESSURE IMPREGNATED WITH A POLYESTER VARNISH AND OVEN CURED TO MAKE THE ASSEMBLY HIGHLY RESISTANT TO MOISTURE, DUST, AND OTHER INDUSTRIAL CONTAMINANTS. INSULATION SYSTEM SHALL BE FIRE RESISTANT AND SELF EXTINGUISHING.

2.2 VOLTAGE AND KVA REQUIREMENTS:

A. PRIMARY VOLTAGE: 13800 VOLTS

B. PRIMARY VOLTAGE BASIC IMPULSE LEVEL (BIL) RATING: 95KV

C. SECONDARY VOLTAGE: 480Y/277 VOLTS

D. SECONDARY VOLTAGE BASIC IMPULSE LEVEL (BIL) RATING: 10KV

E. KVA RATING: AS NOTED ON CONSTRUCTION DRAWINGS.

F. SYSTEM FREQUENCY: 60 HERTZ

2.3 KEY REQUIREMENTS:

A. STANDARD IMPEDANCE AT 60HZ:

A.1. 225 TO 300 KVA 3% - 6%

A.2. 500 KVA 4% - 7%

A.3. 750 - 5000 KVA 4.5% - 8%

B. EFFICIENCIES: (WHERE APPLICABLE)

B.1. EFFICIENCIES WILL MEET LEVELS DEFINED (WHERE APPLICABLE) IN DOE 10 CFR PART 431 IN EFFECT ON JANUARY 1ST, 2016.

B.2. EFFICIENCIES AT 50% OF RATED LOAD ON UNITS HAVING A PRIMARY VOLTAGE BIL RATING GREATER THAN 20KV.

B.3. EFFICIENCIES ARE CALCULATED UNDER A LINEAR LOAD PROFILE.

B.4. EFFICIENCIES, NO-LOAD LOSSES, LOAD LOSSES AND IMPEDANCE VALUES WILL BE CALCULATED AT TEMPERATURE REFERENCE OF 75°C AT UNITY POWER FACTOR (UPF).

B.5. REFER TO THE DOE 10 CFR PART 431 ENERGY EFFICIENCY STANDARDS FOR PRODUCT EXEMPTION CRITERIA.

2.4 BASIC REQUIREMENTS:

A. INSULATION CLASS: 220°C SYSTEM

B. TEMPERATURE RISE: AVERAGE WINDING RISE BY RESISTANCE SHALL NOT EXCEED 150 °C IN AN AVERAGE 30°C AND A MAXIMUM 40°C AMBIENT.

C. TAPS: 2 X 2.5% FCAN AND 2 X 2.5% FCBN

D. THREE-PHASE, COMMON CORE CONSTRUCTION. CONVECTION AIR COOLED.

E. IMPREGNATION: VACUUM PRESSURE IMPREGNATED (VPI) POLYESTER RESIN.

F. EXCITATION CURRENT: 3% OF FULL LOAD CURRENT RATING (MAX.)

G. SOUND LEVEL TO MEET IEEE C57.12.01

H. ENCLOSURE: VENTILATED NEMA 3R.

I. ENCLOSURE FINISH: ANSI 61 GREY SUITABLE FOR UL50 OUTDOOR APPLICATIONS.

J. ANTI-VIBRATION PADS/ISOLATORS SHALL BE USED BETWEEN THE TRANSFORMER CORE AND COIL AND THE ENCLOSURE.

K. UL LISTED.

OPTIONS:

- AN ELECTROSTATIC SHIELD SHALL BE PROVIDED.
- RODENT AND INSECT SCREENS ON VENTILATION OPENINGS.
- ROLLING AND SKIDDING BASE: 4 DIRECTIONS.
- PROVISION FOR LIFTING AND JACKING.

2.5 ACCEPTABLE PRODUCT AND MANUFACTURER:

A. MGM TRANSFORMER COMPANY

B. HAMMOND POWER SOLUTIONS INC.

C. SCHNEIDER ELECTRIC.

D. EATON.

E. SUBSTITUTIONS ARE PERMITTED, SUBJECT TO MEETING ALL REQUIREMENTS OF THIS SPECIFICATION AND ALSO HAVING WRITTEN APPROVAL BY ENGINEERING 10 DAYS PRIOR TO BID CLOSING.

EXECUTION

2.6 INSTALLATION

A. THE INSTALLING CONTRACTOR SHALL INSTALL THE DRY-TYPE MEDIUM VOLTAGE (POWER) TRANSFORMER PER THE MANUFACTURER'S RECOMMENDED INSTALLATION PRACTICES AS FOUND IN THE INSTALLATION, OPERATION, AND MAINTENANCE MANUAL AND COMPLY WITH ALL APPLICABLE CODES.

B. MAKE SURE THAT THE TRANSFORMER IS LEVEL.

C. THE TRANSFORMER SHALL BE MOUNTED ON A CONCRETE PAD UNLESS OTHERWISE INDICATED.

D. CHECK FOR DAMAGE AND LOOSE CONNECTIONS.

E. MOUNT TRANSFORMER ON SUITABLE ISOLATION PAD TO MINIMIZE VIBRATIONS.

F. COORDINATE ALL WORK IN THIS SECTION WITH ALL WORK OF OTHER SECTIONS.

G. TAKE INFRARED PICTURE TO VERIFY CONNECTIONS ACCURACY OR DEFICIENCIES.

H. PRIOR TO ENERGIZING TRANSFORMER, VERIFY SECONDARY VOLTAGES AND IF NECESSARY ADJUST SECONDARY TAPS.

I. REPORT ON THE COMMISSIONING OF THE TRANSFORMER SHALL INCLUDE:

I.1. PRIMARY & SECONDARY VOLTAGES

I.2. PRIMARY & SECONDARY THDI & THDV

TO THE BEST KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE.

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KEY PLAN

REV	DESCRIPTION	DATE

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CHECKED BY :	B.NEMCHEK
APPROVED BY :	J.MIZRAHI
DATE :	12/02/21
SCALE :	N.T.S.

DRAWING TITLE :
ELECTRICAL SPECIFICATIONS
SHEET 4 OF 4

DWG NUMBER :
E-904