GENERAL SPECIFICATIONS:

DIVISION 26 – ELECTRICAL
PART 1 GENERAL
CONDITIONS OF THE CONTRACT AND DIVISION 1 APPLY TO THIS SECTION.
SPECIFICATIONS FOR SECTION 26 – ELECTRICAL ARE HEREBY INCLUDED IN THIS DIVISION.

1.01 DESCRIPTION

A. GENERAL: FURNISH LABOR, MATERIALS, APPARATUS, TOOLS, EQUIPMENT, TRANSPORTATION, TEMPORARY CONSTRUCTION AND SERVICES AS REQUIRED TO MAKE A COMPLETE WORKING ELECTRICAL INSTALLATION, AS SHOWN ON THE DRAWINGS OR DESCRIBED IN THESE SPECIFICATIONS. THE WORK SHALL INCLUDE MATERIALS, APPLIANCES, AND APPARATUS NOT SPECIFICALLY MENTIONED HEREIN OR NOTED ON DRAWINGS, BUT REQUIRED FOR A COMPLETE INSTALLATION, IN ADDITION, IT SHALL INCLUDE CONNECTION, INTER–CONNECTION, AND POWER FOR ELECTRICAL EQUIPMENT FURNISHED UNDER OTHER SECTIONS.

B. CONTRACTOR SHALL REVIEW ALL CONTRACT DOCUMENTS INCLUDING, BUT NOT LIMITED TO, ARCHITECTURAL CEILING PLANS, ARCHITECTURAL DETAILS, DOOR HARDWARE SCHEDULES, AND MECHANICAL DOCUMENTS. ALL POWER SERVICE WIRING, BRANCH CIRCUIT WIRING, CONTROL WIRING, OR OTHER WIRING NECESSARY FOR COMPLETE OPERATION OF EQUIPMENT OR FIXTURES NOT SPECIFICALLY REQUIRED TO BE INSTALLED UNDER ANOTHER SECTION OF THIS SPECIFICATION, SHALL BE PROVIDED WHETHER OR NOT SUCH WIRING IS SPECIFICALLY SHOWN ON ELECTRICAL DRAWINGS OR DESCRIBED IN DIVISION 16 SPECIFICATIONS.

1.02 WORK INCLUDED

A. FURNISH COMPLETE INSTALLATION OF ELECTRIC BRANCH CIRCUIT WIRING, WIRING DEVICES, LIGHTING FIXTURES, LAMPS, AND OTHER WORK INDICATED ON THE DRAWINGS.

B. POWER SUPPLY WIRING TO ALL MOTORS INCLUDING FURNISHING AND INSTALLING DISCONNECT SWITCHES AND MANUAL STARTERS WHERE REQUIRED.

C. CONTROL WIRING FOR MECHANICAL EQUIPMENT AS INDICATED IN RESPECTIVE SECTIONS OF SPECIFICATIONS AND AS SHOWN ON DRAWINGS.

D. EMPTY RACEWAY SYSTEMS AS MAY BE REQUIRED BY OTHERS AND AS NOTED OR SHOWN ON OTHER DRAWINGS.

PART 2 WORK BY OTHERS

2.01 GENERAL CONTRACTOR

A. PAINTING OF ELECTRICAL WORK AND EQUIPMENT INSTALLED BY THE ELECTRICAL CONTRACTOR, SUCH AS EXPOSED CONDUIT, J–BOXES, ETC... IN PUBLIC AREAS ARE TO BE BY THE GENERAL CONTRACTOR.

B. OPENINGS, RECESSES, FURRING, ETC., AS REQUIRED FOR ELECTRICAL EQUIPMENT SHALL BY BY THE GENERAL CONTRACTOR.

2.02 OTHER

A. SPECIFIC ITEMS ON DRAWINGS IDENTIFIED AS N.I.C. (NOT IN CONTRACT) ARE FURNISHED BY OTHERS AND INSTALLED BY CONTRACTOR.

PART 3 BASIC MATERIALS AND METHODS

3.01 RACEWAYS AND FITTINGS

A. ALL WIRING SHALL BE IN ELECTRICAL METALLIC TUBING (EMT) UNLESS SHOWN OTHERWISE ON DRAWINGS.

1. CONDUIT, IN GENERAL, SHALL BE CONCEALED IN ALL FINISHED AREAS.
2. CONDUITS SHALL BE OF SIZE SHOWN ON DRAWINGS. IF SIZE IS OMITTED, DETERMINE FROM N.E.C.
3. CONDUIT CONNECTIONS TO BOXES OF SHEET STEEL TO BE MADE WITH PROPER FITTINGS SUCH AS LOCKNUTS OR BOX CONNECTORS MADE UP TIGHT SO AS TO ASSURE EFFECTIVE ELECTRICAL CONTINUITY.
4. OUTLET AND JUNCTION BOXES GENERALLY SHALL BE OF CODE GAUGE GALVANIZED STEEL, 1–1/2" MINIMUM DEPTH. BOXES SUPPORTING LIGHTING FIXTURES SHALL BE EQUIPPED WITH FIXTURE STUD. LEAVE NO UNUSED OPENINGS. BOXES TO BE EQUAL TO STEEL CITY OR HUBBELL.
5. LOW VOLTAGE CONDUIT MAY BE PLASTIC IF ALLOWED PER LOCAL CODE.

3.02 CONDUCTORS

A. UNLESS SPECIFICALLY INDICATED ON DRAWINGS OR HEREIN, CONDUCTORS, SHALL BE SINGLE CONDUCTOR, COPPER, INSULATED FOR 600 VOLTS, MANUFACTURER'S STANDARD PRODUCT, AND MARKED AS REQUIRED BY N.E.C.. TYPE OF INSULATION SHALL BE AS FOLLOWS:

1. SERVICE CONDUCTOR TO BE THW, XHHW, OR THWN.
2. BRANCH CIRCUITS AND FEEDERS NO. 8 AND SMALLER TO BE TYPE THHN, THWN, XHHW.
3. NO. 8 OR LARGER SHALL BE STRANDED. NO. 10 AND SMALLER SHALL BE SOLID.
4. MINIMUM BRANCH CIRCUIT CONDUCTOR SIZE TO BE NO. 12. LINE VOLTAGE CONTROL WIRING MAY BE NO. 14 WHERE PROPERLY PROTECTED BY OVER–CURRENT DEVICE.
5. LOW VOLTAGE CONTROL (THERMOSTAT, ETC.) CIRCUITS SHALL UTILIZE 18 GAUGE, 600 VOLT, MULTI–CONDUCTOR COPPER CABLE, UNLESS SHOWN OTHERWISE.
6. MAKE SPLICES AND TERMINATIONS ONLY IN ACCESSIBLE BOXES, WIREWAYS, CABINETS, OR FIXTURES.

3.03 ELECTRICAL SUPPORTING DEVICES

A. SINGLE CONDUIT RUNS SHALL BE SUPPORTED BY ONE HOLE ZINC–COATED CONDUIT STRAP SIMILAR TO APPLETON SL SERIES OR CONDUIT HANGERS SIMILAR TO APPLETON H––W/B OR H––SWB SERIES.

B. MULTIPLE HORIZONTAL CONDUIT RUNS SHALL BE SUPPORTED ON TRAPEZE TYPE HANGERS CONSISTING OF STRUCTURAL SUPPORT EQUAL TO UNISTRUT 1–5/8" X 1–5/8" BRITELINE WITH TWO 3/8" NON–RUSTING RODS. SECURE CONDUITS TO SUPPORT WITH UNISTRUT CLAMPS.

3.04 GROUNDING SYSTEM

A. ALL ITEMS REQUIRED TO BE GROUNDED BY ARTICLE 250 OF THE N.E.C. SHALL BE GROUNDED AS PROVIDED THEREIN OR AS SHOWN ON THE DRAWINGS. ALL RACEWAYS SHALL INCLUDE GREEN INSULATED GROUNDING CONDUCTOR.

B. BONDING SHALL BE PROVIDED WHEN REQUIRED TO ASSURE ELECTRICAL CONTINUITY.

3.05 ELECTRICAL DISTRIBUTION SYSTEM

A. BRANCH CIRCUITS: WHERE BRANCH CIRCUITS ARE RUN EXPOSED, THEY SHALL BE RUN PARALLEL WITH WALLS, CEILINGS, AND FLOORS.

B. CONCEALED CONDUIT SHALL BE RAN THE SHORTEST BOX TO BOX ROUTE, AVOIDING CONFLICTS WITH OTHER TRADES.

C. AT EXISTING PANELBOARDS AFFECTED BY REMODEL, AN UPDATED CIRCUIT DIRECTORY SHALL BE TYPED AND POSTED ON THE INSIDE OF THE DOOR. BRANCH CIRCUIT BREAKERS TO EXISTING PANELBOARDS SHALL BE FURNISHED AND INSTALLED AS REQUIRED, MATCH EXISTING MANUFACTURER.

3.06 WIRING DEVICES

A. WIRING DEVICES SHALL BE EQUAL IN QUALITY, FUNCTION AND GENERAL APPEARANCE TO THE FOLLOWING:

1. FLUSH WALL SWITCHES: 20A, 120/277V, SPECIFICATION GRADE, WHITE; EQUAL TO 1221–1 HUBBELL FOR SINGLE POLE. FURNISH 2–POLE, 3–WAY, ETC., AS REQUIRED, SAME SERIES.
2. WALL RECEPTACLES: 20A, 125V, 2P, 3W, GROUNDING, WHITE, NEMA 5–20R SPECIFICATION GRADE; EQUAL TO 5362–I HUBBELL. RECEPTACLES TO BE DUPLEX AS INDICATED ON DRAWINGS.
   2A. SINGLE CONVENIENCE RECEPTACLE: 53611 HUBBELL.
   2B. GFCI RECEPTACLE: GF53621 HUBBELL.
   2C. TELEPHONE JACK(FOUR CONDUCTOR): CX141 HUBBELL.
3. WALL PLATES SHALL BE SMOOTH FACE NYLON, WHITE, OR MATCHING WALL FINISH, EXCEPT FOR STOCK ROOM. WALL PLATES SHALL BE STAINLESS STEEL IN BACK OF HOUSE AND SERVICE AREA. WALL PLATES IN FRONT OF HOUSE SHALL BE WHITE, OR MATCHING WALL FINISH.

3.07 LIGHTING FIXTURES

A. CONTRACTOR SHALL FURNISH ALL LIGHTING FIXTURES COMPLETE WITH LAMPS, MOUNTING ACCESSORIES, ETC., AS SHOWN ON FIXTURE SCHEDULE. INSTALL EACH FIXTURE AND PLACE IN OPERATION UNLESS SHOWN OTHERWISE ON DRAWINGS OR STATED HEREIN. FRAMES, ETC., SHALL BE APPROPRIATE FOR CEILING FINISH.

3.08 SAFETY AND DISCONNECT SWITCHES

A. SAFETY AND DISCONNECT SWITCHES SHALL BE HEAVY DUTY TYPE, QUICK–MAKE. QUICK–BREAK FUSED WITH RATINGS AND SIZES AS NOTED ON PLANS AND REQUIRED BY CODES. LUG CONNECTIONS TO BE 75°C RATED.

B. SWITCHES SHALL BE WEATHER PROOF IN OUTDOOR LOCATIONS OR AS REQUIRED BY LOCAL CODES. DISCONNECT SWITCHES THAT ARE INSTALLED AT HVAC EQUIPMENT SHALL BE FUSED IF NOT PROTECTED WITH A HACR BREAKER IN ACCORDANCE WITH THE EQUIPMENT'S NAME PLATE AND MANUFACTURER'S REQUIREMENT PER THE LATEST EDITION OF THE NEC, STATE AND LOCAL CODES.

C. MANUAL MOTOR STARTERS LESS OVERLOAD PROTECTION HEATERS ARE TO BE USED AS A DISCONNECTING MEANS ONLY WHERE INDICATED ON DRAWINGS FOR MOTORS ABOVE 1–1/2 HP AT 120 VOLTS AND 2HP AT 240 VOLTS THAT DO NOT REQUIRE AUXILIARY CONTROL. MOTORS THAT ARE BELOW 1–1/2 HP AT 120 VOLTS AND 2HP AT 240 VOLTS ARE TO BE PROVIDED WITH HUBBELL "HBL1221" OR "HBL1222" AC SWITCH.

D. MANUFACTURE SHALL BE SQUARE "D" OR APPROVED EQUAL.

E. FUSES SHALL BE BUSSMAN CURRENT LIMITING TIME DELAY, TYPE LPS AND/OR TYPE KRPC AS REQUIRED.

3.09 PANELBOARDS

A. ALL PANELBOARDS SHALL BE FACTORY ASSEMBLED OF THE BOLTED CIRCUIT BREAKER TYPE WITH SOLID COPPER BUSSING, FULLY SIZED COPPER NEUTRAL, 100% GROUND BUSSING, AND OVERALL HINGED/LOCKABLE DOOR. ALL CIRCUIT BREAKERS SHALL BE OF THE QUICK–MAKE AND QUICK–BREAK DESIGN. THERMAL–MAGNETIC TYPE, TRIP FREE AND TRIP–INDICATING. ALL PANELS SHALL BE DEAD FRONT AND FLUSH OR SURFACE MOUNTED AS SHOWN. ALL LIGHTING BRANCH CIRCUIT BREAKERS SHALL BE SWITCHING DUTY RATED.

B. CONTRACTOR SHALL FURNISH AND INSTALL A TYPE WRITTEN DIRECTORY CARD OF THE CIRCUITS AND PLACE IN PANEL DOOR FOR NEW AND EXISTING PANELS.

C. ALL PANELBOARDS PHASE AMPERAGE SHALL BE BALANCED TO WITHIN 10 PERCENT MAX. TO MIN. REASSURANCE NON–LIGHTING BRANCH CIRCUITS AS REQUIRED AND NOTE CHANGES ON RECORD DRAWINGS.

D. ALL LUG CONNECTIONS TO BE 75°C RATED.

E. MANUFACTURE: SQUARE "D" OR APPROVED EQUAL.

3.10 TELEPHONE AND DATA WIRING

A. FURNISH AND INSTALL A SYSTEM OF CONDUIT RACEWAYS, OUTLET BOXES, PULL WIRES, AND TERMINAL BOARDS AS SHOWN. TELEPHONE SWITCHING APPARATUS, INSTRUMENTS, MISCELLANEOUS EQUIPMENT AND APPURTENANCES ARE NOT PART OF THIS CONTRACT AND WILL BE PROVIDED AND INSTALLED BY THE OWNER.

B. OUTLET BOXES TO BE 4" SQUARE MIN. WITH SINGLE DEVICE COVER AND TELEPHONE PLATE

3.11 DRY TYPE TRANSFORMERS

A. UNLESS OTHERWISE INDICATED OR SCHEDULED, THREE–PHASE TRANSFORMERS SHALL BE 480V DELTA PRIMARY AND 208–120V WYE SECONDARY. TRANSFORMERS 15KVA AND LARGER, PROVIDE A MINIMUM OF FOUR (4) 2–1/2% FULL CAPACITY PRIMARY TAPS.

B. INSULATION SYSTEMS
1. 3KVA–15KVA: 185C INSULATION BASED UPON 115C MAX TEMPERATURE RISE ABOVE 40C AMBIENT
2. 15KVA AND ABOVE: 220 DEGREE INSULATION SYSTEM BASED UPON 115C MAX TEMP RISE ABOVE 40C AMBIENT.
3. INSULATION MATERIALS: FLAME RETARDANT, NOT SUPPORTING COMBUTION, AS DEFINED BY ASTM D635 AND NEMA ST20.

C. CORE AND COIL ASSEMBLIES:
1. CORE CONSTRUCTED OF HI–GRADE, NON–AGING SILICON STEEL WITH HI–MAGNETIC PERMEABILITY, LOW HYSTERESIS, AND EDDY CURRENT LOSSES. MAX MAGNETIC FLUX DENSITIES SHALL BE MAINTAINED SUBSTANDIALLY BELOW THE SATURATION POINT. PROVIDE CORE VOLUME SUFFICIENT TO ALLOW EFFICIENT OPERATION AT 10% ABOVE HIGHEST TAP VOLTAGE. CLAMP AND COMPRESS CORE LAMINATIONS TOGETHER USING STRUCTURAL STEEL ANGLES.
2. TRANSFORMER COILS OF CONTINUOUS WOUND ALUMINUM CONDUCTOR
3. UNITS RATED 15KVA AND BELOW TO BE ENCAPSULATED ASSEMBLED CORE AND COIL IN A RESIN AND AGGREGATE MIXTURE, PROVIDING A MOISTUREPROOF AND SHOCK RESISTANT SEAL.
4. UNITS RATED LARGER THAN 15KVA TO BE IMPREGNATED ASSEMBLED CORE AND COIL USING NON–HYDROSCOPIC THERMOSETTING VARNISH AND HEAT CURE TO SEAL OUT MOISTURE. SECRUE THE COMPLETED CORE AND COIL TO BASE WITH VIBRATION ABSORBING MOUNTS, WITHOUT METAL–TO–METAL CONTACT BETWEEN THE CORE OR COIL AND THE ENCLOSURE

D. ENCLOSURES
1. UNITS RATED 15KVA AND BELOW TO BE NEMA 3R TOTALLY ENCLOSED NONVENTI–LATED, CONSTRUCTED OF HEAVY GAUGE, COLD ROLLED SHEET STEEL SUITABLE FOR WALL MOUNTING.
2. UNITS RATED ABOVE 15KVA TO BE VENTILATED AND DRIP–PROOF, CONSTRUCTED OF HEAVY GAUGE COLD ROLLED SHEET STEEL. TRANSFORMERS 75KVA AND BELOW SHALL BE DESIGNED FOR EITHER FLOOR OR WALL MOUNTING. UNITS ABOVE 75KVA SHALL BE FLOOR–MOUNTED

E. MAX TEMPERATURE OF THE TOP OF THE ENCLOSURE SHALL NOT EXCEED 35C RISE ABOVE A 40C AMBIENT.

F. MAX SOUND LEVELS:
1. 0–30KVA 45dB; 31–225KVA 50dB; 226–300KVA 55dB; 301–500KVA 60dB

END OF SECTION

SELSER SCHAEFER
ARCHITECTS, INC.
1350 S. BOULDER AVENUE
SUITE 1100
TULSA, OK 74119-3204
918.587.2282
FAX 918.587.2285
SELSERSCHAEFER.COM

MPW
ENGINEERING, LLC
110 West 7th Street • Suite 600
Tulsa, Oklahoma 74119
(918) 582-4088
(918) 582-4087 FAX
CA #2940
EXP 06-30-11

CHEROKEE NATION. Entertainment

CNE INTERCHANGE PARK TENANT IMPROVEMENT

10838 EAST
MARSHALL STREET,
TULSA, OKLAHOMA 74116

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BRS

SHEET TITLE

DIVISION 26
SPECIFICATIONS

REGISTERED PROFESSIONAL ENGINEER
BEN R. SCELA
22813
OKLAHOMA
11-4-10

E601

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