

EXISTING ELECTRICAL AND DEMOLITION NOTES

- PRIOR TO SUBMITTING BID, VISIT THE JOB SITE AND BECOME FULLY ACQUAINTED WITH THE EXISTING CONDITIONS OF THE FACILITY AND RELATED SITE. REVIEW THE GENERAL NOTES AND ALL OTHER TRADE DRAWINGS FOR ADDITIONAL REQUIREMENTS THAT MAY NOT BE CALLED OUT IN THIS PORTION OF THE CONSTRUCTION DOCUMENTS. NOTIFY ARCHITECT, ENGINEER OR OWNER, AS SPECIFIED, OF ANY CONFLICTS OR DISCREPANCIES PRIOR TO SUBMITTING BID.
- ANY EXISTING CONDITIONS REFLECTED WERE TAKEN FROM ORIGINAL DRAWINGS AND SITE VISITS AND MAY NOT REFLECT EXACT "AS-BUILT" CONDITIONS. FIELD VERIFY ALL EXISTING CONDITIONS AND CAREFULLY COORDINATE NEW WORK AND DEMOLITION WITH ALL OTHER DISCIPLINES AND EXISTING CONDITIONS.
- PROVIDE ALL DEMOLITION OF EXISTING ELECTRICAL SYSTEMS AND NEW ELECTRICAL SYSTEM MODIFICATIONS REQUIRED BECAUSE OF BUILDING REMODELING, AS NOTED ON THE DRAWINGS, OR NECESSARY FOR PROPER OPERATION AND NEW CONSTRUCTION. REMOVE ALL ABANDONED CABLES AND WIRING ABOVE ACCESSIBLE CEILING AND VENTILATION SHAFTS.
- COORDINATE INTERUPTION OF ALL BUILDING SERVICES INCLUDING BUT NOT LIMITED TO BRANCH CIRCUITS, DATA, TELEPHONE, ETC WITH BUILDING OWNER PRIOR TO INTERUPTION. PROVIDE LABOR AND MATERIALS AS REQUIRED TO REDUCE INTERUPTIONS IN ORDER TO MAINTAIN EXISTING OPERATION.
- PAY SPECIAL ATTENTION NOT TO DAMAGE THE FINISH OF EXISTING WALLS AND CEILINGS THAT ARE TO REMAIN WHEN REMOVING OR REPLACING LIGHT FIXTURES AND OTHER ELECTRICAL DEVICES. REPAIR ANY DAMAGE CAUSED DURING WORK AT NO EXTRA COST TO THE OWNER. REFER TO ARCHITECTURAL DRAWINGS FOR ADDITIONAL INFORMATION.
- RELOCATE ALL EXISTING ELECTRICAL, FIRE ALARM, AND OTHER LOW-VOLTAGE SYSTEMS REQUIRED TO BE IN OPERATION AT SUBSTANTIAL COMPLETION OF THE CONTRACT, IF REQUIRED, AS A RESULT OF WORK INCLUDED UNDER THIS CONTRACT, EVEN IF NOT SPECIFICALLY INDICATED IN THE DRAWINGS OR SPECIFICATIONS.
- SEAL ALL PENETRATIONS THROUGH FLOORS, WALLS, CEILING, AND ROOF WHERE ELECTRICAL COMPONENTS ARE REMOVED AND WHERE THE EXISTING PENETRATION IS NOT USED FOR THE NEW INSTALLATION. REPAIR DAMAGED SURFACES TO MATCH ADJACENT AREAS OR AS DIRECTED BY THE OWNER.
- UNLESS NOTED OTHERWISE, ABANDONED CONDUIT ASSEMBLIES SERVING DEMOLISHED DEVICES SHALL BE REMOVED BACK TO NEAREST JUNCTION BOX OUTSIDE OF AREA OF DEMOLITION AND LABELED AS REQUIRED FOR FUTURE USE. ASSOCIATED WIRING SHALL BE REMOVED BACK TO SERVING PANELBOARD. UPDATE PANELBOARD CIRCUIT DIRECTORY AS REQUIRED TO INDICATE RELATED CIRCUIT(S) AS "SPARE".
- ANY PANELBOARD CIRCUIT DISCRPTIONS SHOWN AS "existing" OR IN OTHER LOWER CASE LETTERING IS INTENDED TO REFLECT AN EXISTING CIRCUIT TO REMAIN IN RESPECTIVE PANELBOARD FOR FUTURE USE UNLESS NOTED OTHERWISE.
- ALL CIRCUIT BREAKERS SERVING BRANCH CIRCUITS TO BE REMOVED SHALL REMAIN IN RESPECTIVE PANELBOARD FOR FUTURE USE UNLESS NOTED OTHERWISE.

GENERAL POWER NOTES

- ALL RECEPTACLES SHALL BE GROUNDING TYPE.
- ALL RECEPTACLES INSTALLED IN BATHROOMS, OUTDOORS AND KITCHENS SHALL HAVE GROUND-FAULT CIRCUIT INTERRUPTER PROTECTION AS REQUIRED BY THE NATIONAL ELECTRIC CODE.
- COORDINATE MECHANICAL EQUIPMENT CONNECTION REQUIREMENTS WITH MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN. LOCATE FEEDERS, DISCONNECTS AND MAINTENANCE RECEPTACLES SO THAT THEY WILL NOT INTERFERE WITH OPERATION OR MAINTENANCE OF MECHANICAL EQUIPMENT.
- PROVIDE POWER TO MECHANICAL, PLUMBING, AND ALL OTHER EQUIPMENT AS REQUIRED FOR PROPER OPERATION. COORDINATE AND VERIFY EACH PIECE OF EQUIPMENT'S POWER/CONTROL REQUIREMENTS PRIOR TO ORDERING RELATED ELECTRICAL EQUIPMENT. REFER TO RELATED MECHANICAL, PLUMBING, AND OTHER RELATED DOCUMENTS FOR LOCATIONS OF EQUIPMENT AND REQUIRED CLEARANCES AROUND EQUIPMENT.
- COORDINATE EXACT MOUNTING HEIGHT OF EACH ABOVE COUNTER RECEPTACLE WITH ARCHITECT AND OWNER PRIOR TO ROUGH-IN.
- ALL OUTLETS IN AREAS REQUIRING GROUND-FAULT CIRCUIT INTERRUPTER PROTECTION OR ARC-FAULT CIRCUIT INTERRUPTER PROTECTION PER NEC-210 SHALL CONSIST OF A GFCI / AFCI PROTECTED DEVICE, EVEN IF NOT SPECIFICALLY INDICATED IN THE DRAWINGS. THE GROUND-FAULT AND ARC-FAULT CIRCUIT INTERRUPTER(S) SHALL BE INSTALLED IN A READILY ACCESSIBLE LOCATION AS DEFINED IN THE NEC. ALL RECEPTACLES SUPPLIED THROUGH A GROUND-FAULT / ARC-FAULT CIRCUIT INTERRUPTER SHALL BE MARKED GFCI / AFCI PROTECTED.
- DO NOT USE MULTI-CONDUCTOR CIRCUITS, WITH A SHARED NEUTRAL, FOR ANY GFCI CIRCUIT BREAKER OR RECEPTACLE CIRCUIT.
- CONTRACTOR SHALL INTERCONNECT MINI SPLIT FAN UNITS AS REQUIRED WITH ASSOCIATED CONDENSING UNITS). CONTRACTOR SHALL PROVIDE AND INSTALL DISCONNECT SWITCH, CONDUIT, CONDUCTORS, AND OTHER NECESSARY APPURTENANCES REQUIRED TO PROVIDE A COMPLETE AND OPERATIONAL SYSTEM PER MANUFACTURER'S RECOMMENDATIONS.
- CONTRACTOR SHALL NOT SHARE NEUTRALS.
- ELECTRIC WATER COOLERS (EWC) SHALL BE PROVIDED WITH GFCI PROTECTION. IF THE RECEPTACLE PROVIDED FOR THE EWC IS LOCATED BEHIND THE EWC, A GFCI CIRCUIT BREAKER SHALL BE PROVIDED. IF THE RECEPTACLE IS ACCESSIBLE THEN A GFCI RECEPTACLE IS ACCEPTABLE.

GENERAL LIGHTING NOTES

- WHERE RECESSED LIGHTING FIXTURES ARE INDICATED IN A FIRE RATED CEILING, PROVIDE A ONE HOUR RATED "TENT" FOR FIXTURE.
- PROVIDE ALL MOUNTING AND SUPPORT HARDWARE FOR LIGHT FIXTURES TO MEET SPECIFIED MOUNTING HEIGHTS. REFER TO ARCHITECTURAL ELEVATIONS FOR EXACT MOUNTING HEIGHTS OF FIXTURES.
- CONNECT "UN-SWITCHED" HOT CONDUCTOR FROM CIRCUIT SERVING SPACE LIGHTING TO EACH EXIT SIGN, EMERGENCY LIGHT, AND ANY FIXTURE DESIGNATED AS NIGHT LIGHT SERVING THE SPACE.
- COORDINATE ALL DEVICES AND WALL-MOUNTED LIGHT FIXTURE LOCATIONS WITH THE ARCHITECTURAL WALL FINISHES AND ELEVATIONS. SPECIAL ATTENTION AND COORDINATION OF WALL TYPES AND FINISHES IS REQUIRED PRIOR TO ROUGH-IN. EXACT LOCATION OF DEVICES SHALL BE COORDINATED WITH THE ARCHITECT PRIOR TO ROUGH-IN TO AVOID INSTALLATION ON SPECIAL ARCHITECTURAL WALL FINISHES. DEVICES NOT PROPERLY COORDINATED WITH THE ARCHITECT PRIOR TO ROUGH-IN SHALL BE RELOCATED AT NO ADDITIONAL COST TO THE OWNER.
- ELECTRICAL CONTRACTOR SHALL VERIFY CHEVRON DIRECTIONS OF ALL EXIT SIGNS PRIOR TO ORDERING.
- FOR BATTERY FED EMERGENCY LIGHTS: PROVIDE EMERGENCY BALLAST PROVIDE "HOT" WIRE TO EMERGENCY BALLAST. SWITCH FIXTURE AS INDICATED ON PLANS.
- COORDINATE AND PROVIDE DIMMER SWITCHES RATED FOR AND COMPATIBLE WITH INTENDED LIGHT FIXTURE(S) TO BE CONTROLLED. CIRCUITS CONTROLLED WITH LINE-VOLTAGE DIMMER SWITCHES SHALL NOT SHARE NEUTRAL CONDUCTORS.

GENERAL LUMINAIRE SCHEDULE NOTES

- CONFIRM ALL FINISH OPTIONS WITH ARCHITECT PRIOR TO ORDERING.
- COORDINATE FINAL MOUNTING HEIGHTS AND MOUNTING OPTIONS WITH ARCHITECT.
- VERIFY THE MOUNTING TYPE OF EACH FIXTURE IS COMPATIBLE WITH ITS FINAL INSTALLATION SURFACE PRIOR TO ORDERING FIXTURES.
- PROVIDE ALL ACCESSORIES REQUIRED FOR A COMPLETE ASSEMBLY, INCLUDING MOUNTING HARDWARE.
- COORDINATE COLOR TEMPERATURE OF ALL FIXTURES WITH ARCHITECT PRIOR TO ORDERING.
- PROVIDE A SUBMITTAL PACKAGE INCLUDING CUTSHEETS FOR EACH FIXTURES.
- SUBSTITUTION REQUESTS MUST BE MADE AT LEAST (6) FULL BUSINESS DAYS PRIOR TO THE CLOSE OF BID.

GENERAL ELECTRICAL NOTES

- DRAWINGS ARE DIAGRAMMATIC ONLY AND REPRESENT THE GENERAL SCOPE OF THE WORK. REVIEW ALL GENERAL NOTES, SPECIFICATIONS AND PLANS FOR ADDITIONAL REQUIREMENTS THAT MAY NOT BE SPECIFICALLY CALLED OUT IN THIS PORTION OF THE CONSTRUCTION DOCUMENTS.
- SPECIAL ATTENTION SHALL BE GIVEN TO ALL RACEWAYS WITHIN FINISHED AREAS WITHOUT CEILING AND EXPOSED TO STRUCTURE. IN GENERAL, ALL RACEWAYS SHALL BE CONCEALED WITHIN WALLS, ABOVE STRUCTURE FINISH, OR BELOW FLOOR SLABS WHEN SPECIFIED. WHERE EXPOSED CONDITIONS ARE NECESSARY OR UNAVOIDABLE DUE TO OTHER CONDITIONS, THE BID SHALL INCLUDE ANY REASONABLE MEANS TO MINIMIZE THE AMOUNT OF SURFACE MOUNTED EQUIPMENT. PRIOR TO ROUGH-IN, COORDINATE ALL EXPOSED RACEWAY AND BOX CONDITIONS WITH ARCHITECT PRIOR TO CONSTRUCTION OF WALLS, ROOF DECK, OR FLOOR SLABS. ATTACHMENT TO ROOF DECK OR JOIST WEBBINGS IS NOT ALLOWED. MAINTAIN A MINIMUM SPACING OF 1-1/2" FROM CONDUIT TO ROOF DECK. IN AREAS WHERE EXPOSED RACEWAYS ARE REQUIRED, INSTALL SYSTEMS SQUARE AND TIGHT STRUCTURE AND PAINT TO MATCH THE STRUCTURE PER ARCHITECT AND/OR OWNER SPECIFICATIONS. FAILURE TO PROPERLY COORDINATE THE ROUTING OF EXPOSED RACEWAYS MAY RESULT IN RELOCATION OF SUCH RACEWAYS AT NO ADDITIONAL COST TO THE OWNER.
- OPENINGS AROUND ELECTRICAL PENETRATIONS THROUGH FIRE-RESISTANT-RATED WALLS, PARTITIONS, FLOORS OR CEILING SHALL BE FIRESTOPPED USING APPROVED METHODS TO MAINTAIN THE FIRE RESISTANCE RATING. PROVIDE PENETRATION FIRE STOPPING WITH RATINGS DETERMINED PER ASTM E 814 OR UL 1479. FIRE STOPPING SHALL NOT BE LESS THAN FIRE RESISTANCE RATING OF CONSTRUCTED PENETRATIONS.
- FIELD MOUNTED DEVICES SUCH AS SWITCHES, MOTOR STARTERS, RECEPTACLES, ETC. ARE SHOWN IN THEIR APPROXIMATE LOCATION. SWITCH MOUNTING HEIGHT SHALL BE 48" ABOVE FINISHED FLOOR AND RECEPTACLE MOUNTING HEIGHT SHALL BE 18" ABOVE FINISHED FLOOR. REFER TO THE TYPICAL MOUNTING HEIGHT DETAIL.
- INSTALL EQUIPMENT IN A MANNER TO REMAIN ACCESSIBLE WITH REASONABLE MEANS BY THE OWNER FOLLOWING COMPLETION OF WORK. SPECIAL ATTENTION AND ADDITIONAL COORDINATION IS EXPECTED IN AREAS OF THE BUILDING WHERE THE CEILING AND STRUCTURE HEIGHTS HAVE SIGNIFICANT DIFFERENT ELEVATIONS. EQUIPMENT REQUIRING POSSIBLE FUTURE ACCESS SHALL BE INSTALLED SUCH THAT IT MAY BE SAFELY ACCESSED FROM A STANDARD STEP LADDER OR PERSONNEL LIFT SUITABLE FOR THE LOCATION AND CEILING HEIGHT, WITHOUT REMOVING OR DAMAGING THE CEILING GRID STRUCTURE.
- ALL WIRING DEVICE COVERPLATES SHALL INDICATE PANELBOARD AND CIRCUIT SERVING THE DEVICE. UTILIZE CLEAR VINYL (BLACK LETTERING) IDENTIFICATION LABELS MANUFACTURED BY 3M COMPANY (OR APPROVED EQUIVALENT).
- JUNCTION BOXES LOCATED ABOVE GRID CEILING SHALL BE LOCATED NO GREATER THAN 4 FEET ABOVE THE CEILING IN A LOCATION ACCESSIBLE VIA A LADDER FROM THE ROOM BELOW.
- ROOM NAMES/NUMBERS SHOWN IN PANELBOARD SCHEDULES ARE PER ARCHITECTURAL FLOOR PLANS. CONTRACTOR SHALL PROVIDE FINALIZED PANELBOARD SCHEDULES AT COMPLETION OF PROJECT WITH OWNER PROVIDED ROOM NAMES/NUMBERS.
- ALL WORK IS TO BE PERFORMED IN STRICT COMPLIANCE WITH THE NATIONAL ELECTRICAL CODE, STATE LAWS, AND ALL OTHER REGULATIONS GOVERNING WORK OF THIS NATURE.
- THE CONTRACTOR IS RESPONSIBLE FOR ALL WORK, MATERIAL AND LABOR TO SATISFY A COMPLETE AND WORKING SYSTEM WHETHER SPECIFIED OR IMPLIED.
- CONTRACTOR TO CONFIRM EXACT LOCATION OF EXISTING AND NEW EQUIPMENT.
- THE CONTRACTOR SHALL FURNISH AND INSTALL ALL GROUNDING SYSTEMS (AS REQUIRED) IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE.
- ALL ELECTRIC MATERIALS AND EQUIPMENT FOR THE PROJECT SHALL BE NEW AND U.L. OR EQUALLY LISTED.
- SUBMIT TO THE OWNER CERTIFICATES OF INSPECTIONS IN DUPLICATE FROM AN APPROVED INSPECTION AGENCY UPON COMPLETION.
- THE CONTRACTOR SHALL SECURE ALL PERMITS OR APPLICATIONS AND PAY ANY AND ALL FEES AS REQUIRED.
- THE CONTRACTOR SHALL FURNISH ALL INSTRUMENTS AND QUALIFIED PERSONNEL OR FIRM TO PERFORM ALL REQUIRED TESTS.
- NO EQUIPMENT SHALL BE ENERGIZED UNTIL ALL TEST AND ADJUSTMENTS HAVE BEEN MADE. THREE COPIES OF ALL TEST RESULTS SHALL BE DELIVERED TO THE OWNER.
- ALL ELECTRICAL WORK SHALL BE COORDINATED WITH THE MECHANICAL WORK AS CALLED FOR IN MECHANICAL SPECIFICATIONS AND PLANS.
- COORDINATE ALL CEILING MOUNTED ELECTRICAL ITEMS WITH OTHER DISCIPLINES WITH CEILING, AND STRUCTURE. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN.
- FIELD VERIFY LOCATIONS OF EXISTING ELECTRICAL EQUIPMENT, INCLUDING POWER POLES, TELEPHONE PEDESTALS, OVERHEAD AND UNDERGROUND FEEDERS, METERS, PANELS, DEVICES, ETC. PROVIDE FOR COORDINATION WITH EXISTING EQUIPMENT.
- CONDUCTORS FOR BRANCH CIRCUITS AS DEFINED IN ARTICLE 100, SHALL BE SIZED TO PREVENT A VOLTAGE DROP EXCEEDING 3% AT THE FARTHEST LOAD, AND WHERE THE MAXIMUM TOTAL VOLTAGE DROP ON BOTH FEEDERS AND BRANCH CIRCUITS TO THE FARTHEST LOAD DOES NOT EXCEED 5%.
- THE TYPE OF CONDUIT SHALL BE AS FOLLOWS FOR ALL FEEDERS AND DISTRIBUTION CIRCUITS, UNLESS OTHERWISE SPECIFIED:
APPLICATION - TYPE OF CONDUIT
BURIED IN CONCRETE OR OUTDOORS - PVC WITH RIGID GALVANIZED STEEL ELBOWS SERVICE ENTRANCE - GALVANIZED RIGID STEEL OR SERVICE UTILITY SPECIFICATIONS.
SEISMIC PROTECTION FOR SEISMIC CONCERNS OF ALL BUILDING SYSTEMS INCLUDING BUT NOT LIMITED TO MECHANICAL, PLUMBING, AND ELECTRICAL, MUST MEET MINIMUM REQUIREMENTS OF ALL APPLICABLE CODES FOR BUILDINGS CLASSIFIED SEISMIC USE GROUP AND SEISMIC DESIGN CATEGORY. ANY REQUIREMENTS FOR SEISMIC PROTECTION MEASURES TO BE APPLIED SHALL BE INSTALLED IN STRICT ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE, AND/OR FEDERAL CODES AND WITH MANUFACTURER'S REQUIREMENTS. THE MOST STRINGENT SHALL APPLY.
THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE TYPE AND LOCATION OF SEISMIC RESTRAINTS REQUIRED FOR THE VARIOUS SYSTEMS ELEMENTS CONTAINED IN THE CONSTRUCTION DOCUMENTS BASED ON THE RELATED SEISMIC CODE CRITERIA. THE SIZE AND WEIGHT OF THE SUPPORTED ELEMENT AND THE DISTANCE FROM STRUCTURE THAT THE ELEMENT WILL BE INSTALLED, IF REQUIRED BY LOCAL, STATE, FEDERAL CODES AND/OR OTHER AUTHORITY HAVING JURISDICTION (AHJ). THE CONTRACTOR SHALL SUBMIT DESCRIPTIVE CATALOG DATA OF SEISMIC RESTRAINTS, SHOP DRAWINGS SHOWING THE TYPES, LOCATIONS AND INSTALLATION DETAILS OF SEISMIC RESTRAINTS AND CALCULATIONS SHOWING THAT THE SEISMIC RESTRAINTS MEET THE SEISMIC REQUIREMENTS TO THE LOCAL AHJ FOR REVIEW AND APPROVAL. CALCULATIONS SHALL BE SIGNED AND SEALED BY A REGISTERED PROFESSIONAL ENGINEER, LICENSED IN THE STATE OF THE PROJECT LOCATION AND EMPLOYED BY THE MANUFACTURER OF THE SEISMIC RESTRAINT PRODUCTS. CALCULATIONS SHALL INCLUDE DEAD LOADS, STATIC SEISMIC LOADS AND CAPACITY OF MATERIALS UTILIZED FOR CONNECTIONS TO EQUIPMENT AND STRUCTURE.
- ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING COVER PLATES AT ANY UNUSED OPENINGS OR JUNCTION BOXES FOR ELECTRICAL AND LOW VOLTAGE BACK BOXES.

ABBREVIATIONS

AC	ABOVE COUNTER	MCC	MOTOR CONTROL CENTER
AFCI	ARC FAULT CIRCUIT INTERRUPTER	NEC	NATIONAL ELECTRICAL CODE
AFT	ABOVE FINISHED FLOOR	NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOC.
CB	CIRCUIT BREAKER	NIC	NOT IN CONTRACT
E	EXISTING	NL	NIGHT LIGHT
EP	ELECTRICAL CONTRACTOR	TR	TAMPER RESISTANT
EP	EXPLOSION PROOF	UG	UNDERGROUND
GFI	GROUND FAULT CIRCUIT INTERRUPTER	UON	UNLESS OTHERWISE NOTED
GR	GROUND	WP	WEATHERPROOF
HP	HORSE POWER	WR	WEATHER RESISTANT
IG	ISOLATED GROUND		

WIRING

- WIRING CONCEALED IN CEILING OR WALLS UON. ALL WIRE IS NUMBER #12 AWG MINIMUM.
- EXPOSED RACEWAY.
- UNDERGROUND RACEWAY: TYPE, SIZE, CONDUCTORS, AND ARRANGEMENT BY NOTATION OR SCHEDULE.

SWITCHES

- SWITCH MOUNTED AT 48", SINGLE POLE UON. LOWER CASE LETTER, WHEN PRESENT, INDICATES FIXTURES CONTROLLED.
- ABBREVIATIONS FOR SWITCH:
 - Z DOUBLE POLE SWITCH
 - 3 3-WAY SWITCH
 - 4 4-WAY SWITCH
 - D DIMMER SWITCH (SHALL BE COMPATIBLE WITH FIXTURE BEING DIMMED)
 - F FAN SWITCH: DUAL OPERATION WITH DIMMER
 - K KEYSWITCH
 - M MOTOR RATED SWITCH
 - O DUAL TECHNOLOGY OCCUPANCY SENSOR
 - V VOLUME CONTROL SWITCH
- OS CEILING MOUNTED DUAL TECHNOLOGY OCCUPANCY SENSOR WITH SPARE DRY CONTACTS. HUBBELL 0MINIDARP SERIES

RECEPTACLES

- DUPLX RECEPTACLE (NEMA 5-20R)
- DUPLX RECEPTACLE (NEMA 5-20R); MOUNTED 8" ABOVE COUNTERTOP.
- (ALL RECEPTACLE TYPES) WITH USB CHARGING PORTS
- GFI DUPLX RECEPTACLE (NEMA 5-20R)
- GFI DUPLX RECEPTACLE (NEMA 5-20R); MOUNTED 8" ABOVE COUNTERTOP.
- QUADRUPLX RECEPTACLE (TWO NEMA 5-20R)
- SPECIAL RECEPTACLE: VERIFY NEMA TYPE WITH MANUFACTURER
- FLOOR BOX WITH DATA: LEGRAND WIREMOLD SERIES RFB4E-0G OR RFB6E-0G WITH EVOLUTION COVER, ROUTE (2) 1" FOR DATA FROM FLOOR BOX TO NEAREST ACCESSIBLE CEILING SPACE. ON FLOOR LEVELS WITH ACCESSIBLE SPACE BELOW, USE POKE-THRU STYLE FLOOR BOXES. LEGRAND GAT SERIES. SEE ARCHITECTURAL PLANS FOR LOCATION UON.
- SINGLE RECEPTACLE (NEMA 5-20R)
- SPLIT WIRED DUPLX RECEPTACLE (NEMA 5-20R)
- DIRECT EQUIPMENT CONNECTION: VERIFY CONNECTION DETAILS WITH MANUFACTURER
- FLOOR BOX: HUBBELL 3FBSS WITH 3SFCB COVER. EC SHALL ROUTE A 1" FOR FLOOR BOX TO NEAREST ACCESSIBLE CEILING SPACE. ON FLOOR LEVELS WITH ACCESSIBLE SPACE BELOW, USE POKE-THRU STYLE FLOOR BOXES. HUBBELL PT2XX SERIES. SEE ARCHITECTURAL PLANS FOR LOCATION UON.
- CEILING MOUNTED RECEPTACLE (NEMA 5-20R)

PANELS AND MISC.

- LIGHT OR POWER PANEL
- 4x4 JUNCTION BOX
- CONTROL STATION TO BE LOCATED AT THIS LOCATION. CONTROL STATION SHALL CONSIST OF 2 USB OUTLETS, A DUPLX RECEPTACLE, AND A DIMMER SWITCH FOR THE WALL SCONES IN THE SAME BOX AND FACEPLATE. CONTRACTOR SHALL COORDINATE FINAL TYPE WITH ARCHITECT PRIOR TO ROUGH-IN AND PURCHASE.

LUMINAIRE SCHEDULE

TYPE	DESCRIPTION	MOUNTING, LOCATION	MANUFACTURER	SERIES VERSION	LAMP	VOLTS	LOAD	NOTES
A1	6", RECESSED, DOWNLIGHT, WHITE, 2000LM - DIMMABLE	RECESSED - CORRIDOR	SPECTRUM LIGHTING	SP6ES SERIES	LED, 3500K	0MVOLT	20 VA	
B1	6", RECESSED, WALL WASHER, WHITE, 2000LM - DIMMABLE	RECESSED - ELEVATOR LOBBY	SPECTRUM LIGHTING	SP6ES SERIES	LED, 3500K	0MVOLT	20 VA	PROVIDE FIXTURE WITH BEAM ANGLE CAPABLE TO WASH THE ENTIRE HEIGHT OF THE WALL
C1	4", RECESSED, DOWNLIGHT, WHITE, 2000LM - DIMMABLE	RECESSED - ELEVATOR LOBBY	SPECTRUM LIGHTING	SP4ES SERIES	LED, 3500K	0MVOLT	20 VA	
F1	1" RECESSED CONTINUOUS RUN LIGHT - DIMMABLE	RECESSED IN WALL - LOBBY F17	ALW LIGHTING	LIGHTPLATE 1 SERIES	LED, 3500K	0MVOLT	26 VA	26 VA PER 4FT. TYPICAL
G1	1" SURFACE MOUNT CONTINUOUS RUN STRIPLIGHT - DIMMABLE	SURFACE-MOUNT - LOBBY F17	ALW LIGHTING	LIGHTPLATE 1 SERIES	LED, 3500K	0MVOLT	26 VA	INSET LED "SLIM" LIGHTS AS GUITAR STRINGS
H1	1" SUSPENDED CONTINUOUS RUN LIGHT - DIMMABLE	SUSPENDED - LOBBY F17	ALW LIGHTING	LIGHTPLATE 1 SERIES	LED, 3500K	0MVOLT	26 VA	SAME HUNG LED "SLIM" LIGHTS EXTEND GUITAR STRINGS BELOW COFFERS AND ACRYLIC PANELS
J1	LED COLOR CHANGING TAPELIGHT BEHIND CEILING DECORATIVE PANELS - DIMMABLE	CHANNEL/COVE MOUNT - LOBBY F17	KLUS INSPIRING SOLUTIONS	K-1920-24 SERIES	LED, RGBW	0MVOLT	19 VA	REFER TO SHEET E6.2 KEYNOTE 1 FOR DMX CONTROLLER SPECIFICATION.
K1	LED WHITE TAPELIGHT BEHIND CEILING DECORATIVE PANELS - DIMMABLE, 354LM PER FOOT	CHANNEL/COVE MOUNT - LOBBY F17	LUMINI LIGHTING	LL9 SERIES	LED, 3500K	0MVOLT	26 VA	BACKLIT, SEMI-TRANSPARENT OR OPAQUE LAMINATE COLOR PRINTED PANELS, MOUNTED ON STAND-OFF TYPE EXISTING COFFERS
P1	3' LARGE ROUND SUSPENDED RING FIXTURE - DIMMABLE	SUSPENDED - LOBBY F17	ALW LIGHTING	MR1.5 SERIES	LED, 3500K	0MVOLT	120 VA	LIGHT FIXTURE ECHOES CIRCLE OF GUITAR SOUND HOLE. VERIFY FINAL DIAMETER AND COLOR WITH ARCHITECT PRIOR TO PURCHASE.
R1	READING LIGHT, BLACK	WALL MOUNT - SUITES	TRINITY LIGHTING	MIX SERIES	LED, 3500K	0MVOLT	10 VA	READING LIGHT TO BE MOUNTED ON WALL. CONTRACTOR SHALL PROVIDE AND INSTALL POWER AS REQUIRED.
S1	EXISTING CORRIDOR WALL SCONCE	WALL MOUNT - CORRIDORS	EXISTING	EXISTING	EXISTING	0MVOLT	50 VA	EXISTING FIXTURES SHALL REMAIN. REFER TO DRAWINGS FOR ADDITIONAL REQUIREMENTS.
T1	TAPE LIGHT FOR HEADBOARD, 125LM PER FOOT	COORDINATE WITH ARCHITECTURAL DETAILS - SUITES	LUMINI LIGHTING	LL9 SERIES	LED, 3500K	0MVOLT	30 VA	PROVIDE LENGTHS AND MOUNTING AS REQUIRED. VERIFY FINAL MOUNTING LOCATION WITH ARCHITECT PRIOR TO ROUGH-IN AND PURCHASE.
U1	LED UNDERCABINET, 780LM PER FOOT	SURFACE MOUNT - SUITES	L11 LIGHTING	LXC2 SERIES	LED, 3500K	0MVOLT	14 VA	PROVIDE REMOTE DRIVER MOUNTING AS REQUIRED PER ARCHITECT'S DIRECTION. PROVIDE SWITCH AT BAR COUNTER TOP TO CONTROL LIGHTS.
W1	BEDROOM DECORATIVE WALL SCONCE, 763LM, DIMMABLE, GOLD FINISH	WALL MOUNT	OXYGEN LIGHTING	EPOCH SERIES	LED, 3500K	0MVOLT	15 VA	VERIFY FINAL FINISH WITH ARCHITECT PRIOR TO PURCHASE.



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PROJECT

CHEROKEE NATION ENTERTAINMENT

KEY PLAN



SHEET TITLE

ELECTRICAL NOTES AND LEGEND

CONSTRUCTION DOCUMENTS

No.	Description	Date
1	Addendum #1	09-13-19

PROJECT NO: 19066T
DRAWN BY: RG/SD
CHECK BY: JB
ISSUE DATE: 09/06/19

E0.0
Scale As indicated

HARD ROCK TOWER RENOVATION

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26B BASIC ELECTRICAL MATERIALS AND METHODS
rev - 20150520

26B 1 METHODS

26B 1-1 RACEWAYS

Metallic Conduit And Tubing:

Electrical Metallic Tubing and fittings (EMT): ANSI C80.3, UL 797.
Reduced wall EMT is not allowed.

Flexible Metal Conduit (FMC): zinc-coated steel or aluminum, UL 11.
Reduced-wall FMC is not allowed.

Intermediate Metal Conduit (IMC): hot-dip galvanized rigid steel conduit: ANSI C80.6, UL 1242.

Liquidtight Flexible Metal Conduit (LFMC): flexible steel conduit with PVC jacket: UL 360

Rigid Metal Conduit (RMC): hot-dip Galvanized Rigid Steel conduit (GRS): ANSI C80.1, UL 6.
Plastic-coated IMC, RMC, and fittings: NEMA RN 1, UL listed.

IMC and RMC fittings: NEMA FB 1; compatible with conduit type and material, UL listed

Non-Metallic Conduit And Tubing:

Rigid Nonmetallic Conduit (RNC): schedule 40 PVC, 90 deg C rated, NEMA TC-2, UL 651; fittings: NEMA TC 3, TC 6; UL 514, compatible with conduit/tubing type and material, UL listed.

Electrical Nonmetallic Tubing (ENT): NEMA TC 13, UL listed.

Liquidtight Flexible Nonmetallic Conduit (LFNC): UL 1660.

ENT and LFNC fittings: Compatible with conduit/tubing type and material, UL listed.

26B 1-2 RACEWAY INSTALLATION

Above Ground Use:
Install all circular raceways concealed above suspended ceilings or concealed in walls or floors wherever possible except where otherwise indicated.

Provide GRS for all conduits run exposed to weather, or exposed to other hazardous conditions.

All other raceways may be EMT where approved by local code. Use compression type fittings for EMT, with all fittings UL listed for the environment in which they are used.

Underground use:

Provide GRS installed below grade with a corrosion resistant bonded-plastic or approved mastic coating. This shall include the 90-degree elbow below grade and the entire vertical transition to above grade.

RNC conduit may be used underground where permitted by local code and where not specifically restricted by these documents. When used, provide coated GRS, as specified above, for all bends greater than 30 degrees, including the 90-degree elbows below grade and the entire vertical risers for transitions from below to above grade or above-slab.

Equipment Connectors:
Use FMC for final connection to each motor and transformer, and to any device that would otherwise transmit motion, vibration, or noise. Use LFMC where exposed to liquids, vapors or sunlight, and to connect to kitchen and food service equipment.

Provide all FMC and LFMC with an insulated bonding conductor.

Use only metal raceways for all power wiring from the output of variable frequency drives to their respective motors. All feeders to variable frequency drives (VFDs) shall be in EMT or other metallic conduit. PVC on fiberglass is not allowed for feeders to VFDs.

General Raceway Installation Requirements:

Install raceways parallel and perpendicular to building lines.

Install raceways to requirements of structure and to requirements of all other work on the project to clear all openings, depressions, pipes, ducts, reinforcing steel, and other immovable obstacles.

Install raceways set in forms for concrete structure in such a manner that installation will not affect the strength of the structure.

Except where approved in writing by the engineer, install no raceway in a slab-on-grade. Locate raceway in granular fill below slabs-on-grade.

Install raceways continuous between connections to outlets, boxes and cabinets with a minimum possible number of bends and not more than the equivalent of four 90-degree bends between connections. Use manufactured elbows for all 45- and 90-degree bends, unless approved by the engineer in advance. Make other bends smooth and even and without flattening raceway or flaking galvanizing or enamel. Radii of bends shall be as long as possible and never shorter than the corresponding trade elbow.

Use long radius elbows for all underground installations, where necessary or indicated.

Securely fasten raceways in place with approved straps, hangers and steel supports as required. Attach raceway supports to the building structure. Hang single raceways for feeders with malleable split ring hangers with rod and turnbuckle suspension from inserts spaced not over 10 feet apart in construction above. Clamp groups of horizontal feeder raceways to steel channels that are suspended from inserts spaced not over 10 feet apart in construction above. Securely clamp vertical feeder raceways to structural steel members attached to structure. Install cable clamps for support of vertical feeders where required. Add raceway supports within 12 inches of all bends, on both sides of the bends. Do not support raceways from suspended ceiling components.

Seam raceways end, thoroughly clean raceways before installation, and keep clean after installation. Plug or cover openings and boxes as required to keep raceways clear during construction and fish all raceways clear of obstructions before pulling conductors. Provide raceways of ample size for pulling of wire and not smaller than code requirements and not less than 1/2-inch in size, unless indicated otherwise on drawings.

Protect all raceway installations against damage during construction. Repair all raceways damaged or moved out of line after roughing-in to meet engineer's approval without additional cost to the owner.

Align and install true and plumb all raceway terminations at panelboards, switchboards, motor control equipment and junction boxes.

Install approved expansion/deflection fittings where raceways pass through (if embedded) or across (if exposed) expansion joints. Also when using RNC or RAC in exposed environments in accordance with the NEC and expansion/contraction properties of RNC or RAC.

Install a pull wire in each empty raceway that is left for installation of conductors or cables under other divisions or contracts. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 24 inches of slack at each end of pull wire.

Make all joints and connections in a manner that will ensure mechanical strength and electrical continuity.

26B 1-3 BUSHINGS AND LOCKNUTS

Rigidly terminate conductors entering sheet metal enclosures to the enclosure with a bushing and locknut on the inside and a locknut or an approved hub on the outside. Conduit shall enter the enclosure squarely.

Provide bushings and locknuts made of galvanized malleable iron with sharp, clean-cut threads.

Where EMT enters a box, provide approved EMT compression connectors.

Use insulated, grounding, or combination, bushings wherever connections is subject to vibration or moisture, when required by NFPA 70, or both.

26B 1-4 CONDUCTORS AND CABLES

Conductor Material:
Annealed (soft) copper complying with ICEA S-95-658/NEMA WC70.

Conductor insulation types: 90-degree C-rated, type THHN/THWN-2 or XHHW-2 complying with ICEA S-95-658/NEMA WC70.

Sizes of conductors and cables indicated or specified are in American Wire Gage (AWG - brown and sharpe).

All feeder and branch circuit conductors no. 8 AWG and larger are stranded.

All conductors, no. 10 AWG and smaller: solid copper

All branch circuit wiring: shall not be smaller than no. 12 AWG. If no conductor size is indicated on the drawings for a branch circuit, provide conductors and conduit sized per NFPA 70 and based on the indicated branch circuit overcurrent protective device (OCPD) rating and number of poles. Where no circuit size (i.e., conductors and OCPD) is indicated on the drawings for a branch circuit, provide three no. 12 AWG conductors, in 1/2-inch raceway, and a 20a circuit breaker.

Control wiring: stranded copper conductors, 600V insulation, of the proper type, size and number as required to accomplish specified function. Minimum size: no. 14 AWG, unless noted otherwise.

Stranded for all flexible cords and cables, or as otherwise indicated.

Unless indicated otherwise, special purpose conductors and cables, such as low voltage control and shielded instrument wiring, shall be as recommended by the system equipment manufacturer.

Type MC cable: 600V, unjacketed: ANSI E119 and E814, UL standards 44 or 83 (as applicable), and 1569, NFPA 70 article 330; aluminum or galvanized steel intrenched armor: THHN- or XHHW-insulated conductors; color code: ICEA method 1, with green insulated grounding conductor

26B 1-5 INSTALLATION OF CONDUCTORS AND CABLES

Install all wiring in approved raceway and enclosures

except where specified or indicated, for low-voltage wiring or direct-buried cables; or, where type MC cable is indicated, specified as acceptable, or both.

Support all conductors and cables in vertical installations, as required by NFPA 70, by installing cable supports or plug-type conduit riser supports, or wire-mesh safety grips.

Install all conductors and cable in raceways continuous without splices or splices. Splice or tap only in approved boxes and enclosures with approved solderless connectors, or crimp connectors and terminal blocks for control wiring, and keep to the minimum required. Insulate all splices, taps, and joints as required by codes.

All materials used to terminate, splice, or tap conductors: designed for, properly sized for, and UL listed for the specific application and conductors involved, and installed in strict accordance with the manufacturer's recommendations, using the manufacturer's recommended tools.

Where wiring is indicated as installed, but the connection is indicated "future" or "by other division, trades, or contracts", leave a minimum 3-foot "pigtail" at the box, tape the ends of the conductors, and cover the box.

The number of conductors in a specific raceway "home run" is typically indicated with cross lines (tick marks) on each "circuit run" on the drawings. In general, the direction of branch circuit "home run" routing is indicated on the drawings, complete with circuit numbers and panelboard designation. Continue all such "home run" wiring to the designated panelboard, as though "circuit runs" were indicated in their entirety.

Multi-wire branch circuits (i.e., shared neutral) shall be provided with a means that will simultaneously disconnect all ungrounded conductors at the point the branch circuit originates. Multi-pole breakers or 3 single pole breakers with a handle tie are two examples.

When multiple home runs are combined into a single raceway such that the number of conductors exceeds four (conductor count is made up of any combination of phase and neutral conductors), the following restrictions apply, which are in addition to those in NFPA 70:

NORMAL or NON-ESSENTIAL CIRCUITS:

Maximum of 16 conductors in a single raceway. For up to eight conductors in a raceway, minimum raceway size: 3/4-inch. For greater than eight conductors, minimum raceway size: 1-inch. Do not install any other type of circuit in this raceway.

The minimum wire size for all conductors in this raceway: no. 10 AWG.

Only 15a and 20a branch circuit homeruns may be combined into one raceway.

ISOLATED GROUND (IG) CIRCUITS:

The Isolated Ground conductor of each IG circuit shall be continuous (no splices) the entire length of the circuit.

IG circuits shall be provided with dedicated neutrals, equipment grounds, and isolated grounds and routed in separate conduits from other circuits.

GFCI CIRCUITS:

Do not use multi-conductor circuits, with a shared neutral, for any GFCI circuit breaker or receptacle circuit.

For branch circuits fed from GFCI circuit breakers, limit the one-way conductor length to 100 feet between the panelboard and the most remote receptacle or load on the GFCI circuit.

Properly identify all terminal blocks and wire terminals for control wiring with vinyl stick-on markers or equivalent. Provide engineer with a list of proposed identifying numbers for review prior to installing markers.

Provide an equipment-grounding conductor, or bonding jumper, as applicable, in all feeders and branch circuits, sized in accordance with NFPA 70 tables 250.66 or 250.122, as applicable, unless indicated as larger on the drawings.

Voltage drop in branch circuits shall not exceed 3 percent.

Wiring shall have insulation of the proper color to match color code system in the table below unless there is a color system currently in use by the facility, in which case the colors are to match the existing system. In larger sizes, where properly colored insulation is not available, use vinyl plastic electrical tape of the appropriate color around each conductor at all termination points, junction and pull boxes

System Voltage

240v and under - 208y/120, 120/240, 120/208, 240/0/120

Phase A - black, phase B - red, phase C - blue, neutral - white, equipment ground green, isolated ground - green w/yellow stripe.

480v and 480y/277v

Phase A - brown, phase B - orange, phase C - yellow, neutral - gray, equipment ground - green.

Use of MC Cable, May Only Be Used:

In lieu of flexible conduit and wiring from light fixtures in accessible ceilings to junction boxes (attached to building structure) above the ceiling. Provide cable whips of sufficient lengths to allow for relocating each light fixture within a 5-foot radius of its installed location, but not exceeding 6 feet in unsupported lengths.

For vertical drops in stud walls.

In lieu of EMT, only for 15a and 20a branch circuits (with up to four (4) conductors, not including ground conductor), and only in dry concealed locations above grade, except where specifically not permitted by NFPA 70.

Do Not Use MC Cable For The Following:

Homeruns to panelboards.

Where exposed to view.

Where exposed to damage.

Hazardous locations.

Wet locations.

When restricted otherwise above, and when specifically disallowed by the local AHJ, landlord, or both.

Circuits that can be supplied by an emergency or standby power source.

26B 1-6 JUNCTION BOXES, PULL BOXES, CABINETS AND WIREWAYS

Provide junction boxes, pull boxes, cabinets and wireways wherever necessary for proper installation of various electrical systems according to NFPA 70 and where indicated on the drawings. Size as required for the specific function or as required by NFPA 70, whichever is larger. Construction shall be of a NEMA design suitable for the environment installed.

Junction boxes installed behind wall covers, and in or on other display fixtures, except where otherwise specified, shall be 4-inch square or larger, with galvanized covers.

26B 1-7 OUTLET BOXES

All outlets including light fixture, switch, receptacle, and similar outlets: National Electrical, Appleton, Steel City, Raco, or approved equal, galvanized steel knockout boxes, suitable in design to the purpose they serve and the space they occupy. Size as required for the specific function or as required by NFPA 70, whichever is larger. Set all outlet boxes in walls, columns, floors, or ceilings so they are flush with the finished surface, accurately set, and rigidly secured in position. Provide plaster rings, extension rings and/or masonry rings as required for flush mounting. Provide approved cast outlet boxes, with hubs and weatherproof covers, in all areas subject to damp, wet, or harsh conditions.

26B 1-8 OUTLET LOCATIONS

Coordinate locations of outlet boxes. Outlets are only approximately located on the small scale drawings. Use great care in the actual location by consulting the various large scale detailed drawings used by other division trades, and by securing definite locations from the architect/engineer.

26B 1-9 MOUNTING HEIGHTS

Unless noted otherwise, install wiring devices as indicated below (note: all dimensions are to the bottom of the outlet box unless noted otherwise).

Receptacles:

Vertically aligned with the ground slot mounted at the bottom: 16 inches above finished floor.

Horizontally aligned, with neutral slot mounted at the top: 16 inches above finished floor.

For above counters: 6 inches above top of counter or as specified by others.

Mechanical and electrical equipment rooms and janitor's closets: 44 inches above finished floor, vertically aligned.

Garages: 24 inches above finished floor, vertically aligned.

Weatherproof exterior receptacles: 24 inches above finished grade or as indicated on drawings, vertically aligned.

GFCI receptacles: same as general receptacles

Isolated ground receptacles: same as general receptacles

SPD receptacles: same as general receptacles

Clock receptacles: 54 inches above finished floor or as specified by others.

Concrete block walls: dimensions above may be adjusted slightly, as required to compensate for variable joint dimensions, such that bottom of top of boxes, as applicable, are at block joints.

Switches:

General: 46 inches above finished floor.

Above counters: same as for receptacles.

Concrete block walls: 40 inches above finished floor (dimension may be adjusted slightly, as required to compensate for variable joint dimensions, such that bottom of boxes are at block joints).

Walls with waingscot: 6 inches minimum above waingscotting, but not exceeding 48 inches above finished floor.

Telephone/Data Outlet Boxes:

General: match mounting height of adjacent wiring device listed above.

Wall-mounted telephone: 40 inches above finished floor.

For other than wiring devices, refer to paragraphs, articles, sections, divisions, or drawings to obtain mounting heights for specific equipment or systems.

26B 1-10 WIRING DEVICES

Unless noted otherwise on the drawings wiring devices are 20a rated devices. Where 15a rated devices are indicated on the drawings or required for circuit rating limitations, provide wiring devices equivalent to those specified for 20a, but rated for 15a.

Provide the following wiring devices where shown on drawings or required. Minor changes relative to the location of electrical equipment may be made to comply with structural and building requirements as determined in the course of construction. Provide all wiring devices of the same manufacturer and not mixed on the project, to the maximum extent possible. Provide color of toggles and receptacles as requested by the engineer:

Duplex convenience receptacles: Specification grade, NEMA 5-20R, 125V, 20A, grounding type, UL listed and labeled, nylon face, side and back wired, self-grounding, manufactured by Leviton or approved equivalent.

Hospital Grade straight blade receptacles: NEMA 5-20R, 125V, 20A, grounding type, UL listed and labeled, nylon face, side and back wired, self-grounding, manufactured by Leviton or approved equivalent.

Hospital Grade straight blade safety type, tamper-resistant receptacles: NEMA 5-20R, 125V, 20A, grounding type, UL listed and labeled, nylon face, side and back wired, self-grounding, manufactured by Leviton or approved equivalent.

Twist-Locking type receptacles: NEMA 15-20R, 125V, 20A, grounding type, UL listed and labeled, nylon face, side and back wired, self-grounding, Leviton 2310 or approved equivalent.

Ground fault circuit interrupter type receptacles: Specification Grade UL listed and labeled complying with UL 943, Class A and NEMA WDW-1-1-10, 125V, 20A, trip at 4-6mA within 0.25 second, and feed-thru type with integral heavy duty NEMA 5-20R receptacle arranged to protect receptacles downstream on the same circuit, manufactured by Leviton or approved equivalent.

Isolated ground receptacles: Specification Grade NEMA 5-20R NEMA 15-20R, 125V, 20A, grounding type, UL listed and labeled, nylon face, side and back wired, furnished with a green pigtail connected to the grounding contact, and grounding contacts electrically isolated from the mounting strap, manufactured by Leviton or approved equivalent.

TVSS receptacles Specification Grade for 125V (150V maximum continuous operating voltage) service: NEMA 5-20R, 125V, 20A, self-grounding type, RFI/EMI noise filtering, UL listed 1449 Second Edition (1998) & 489, equipped with LED indicator(s) and audible alarm, manufactured by Leviton or approved equivalent.

Suppression module shall protect normal and common modes, with the following mode characteristics, and be suitable for ANSI/IEEE C62.41-1991 A, B installations:

Peak Energy 240 joules minimum

Peak Current 13,000A minimum

UL 3000A Test1400V minimum

Response Time 5 nano-seconds

Special Warranty: Manufacturer agrees to repair or replace TVSS receptacles, or replaceable surge modules (if removable), that fail in materials or workmanship within 5 years from date of Substantial Completion.

Special purpose receptacles: Grounding type, UL listed with NEMA configurations as implied on the Drawings, manufactured by Leviton or approved equivalent.

Switches: Specification grade, rated for 120/277V, 20a, back and side wired, and UL listed and labeled, manufactured by Leviton or approved equivalent.

Pilot Light switches: 20A, 1-pole, 2-pole, 3-way switch with red neon lighted handle. Toggle shall be illuminated when the switch is in the "ON" position, manufactured by Leviton or approved equivalent.

Lighted Handle switches: 20A, 1-pole, 3-way switch with clear neon lighted handle. Toggle shall be illuminated when the switch is in the "OFF" position. Manufactured by Leviton or approved equivalent.

Key operated light switches: Same as standard light switches except toggle handle shall be operated by a factory provided key, manufactured by Leviton or approved equivalent.

Switches for use with mechanically-held, electrically-operated lighting contacts: Single pole, double throw, momentary, center off switch, rated for 120/277V, and UL listed and labeled, manufactured by Leviton or approved equivalent.

Wall box dimmers: Specification grade slider type wall box dimmers, UL listed and labeled, with Radio Frequency Interference (RFI) filters to avoid interference with electronic equipment, and a minimum wattage as indicated on the Drawings or as required for the load, manufactured by Leviton or approved equivalent.

Dual Voltage Switch Relay: A normally-open, electrically-held relay that allows a single-pole switch to control loads operating at two different voltages (e.g., 120V and 277V), listed to UL Standard 916; installed in a 2-gang outlet box, with a voltage-separating barrier and plaster ring manufactured by Lighting Controls and Designs (GR 2001 DV) or approved equivalent.

Wall switch occupancy sensors: Passive Infrared type, wall box switch, 120/277V, up to 20-minute time delay, light level sensor, 180-degree field of view, square-foot coverage as required for minimum coverage of the space per the manufacturer, UL listed and labeled, and conforms to California Title 24 Energy Code, manufactured by Leviton or approved equivalent.

Wall switch occupancy sensors: Adaptive technology type, wall box switch, 120/277V, up to 20-minute time delay, light level sensor, 180-degree field of view, square-foot coverage as required for minimum coverage of the space per the manufacturer, UL listed and labeled, and conforms to California Title 24 Energy Code, manufactured by Leviton or approved equivalent.

Ceiling mounted occupancy sensors: Dual technology type, 120/277V, up to 20-minute time delay, light level sensor, 360-degree field of view, square-foot coverage as required for minimum coverage of the space per the manufacturer, UL listed and labeled, and conforms to California Title 24 Energy Code, manufactured by Leviton or approved equivalent.

26B 1-11 SWITCH AND OUTLET COVER PLATES

Switch and outlet plates: Satin stainless steel; by the same manufacturer as the wiring devices, wherever possible. Verify desired materials and colors with architect and/or engineer before installation. Switch plates in unfinished rooms and spaces: stamped steel, cadmium plated. Install groups of switches under one ganged-plate, usually horizontally, or, where required by details, vertically. Set all cover plates plumb, parallel, and finished flush with the wall.

26B 2-3 GROUNDING

Permanently and effectively ground and bond the electrical installation in a thorough and efficient manner, and in conformance, at a minimum, with NFPA 70, or these documents, where they exceed code requirements. Use bare or insulated conductors, as specified herein, and other materials indicated on the drawings.

26B 3-12 SURGE-PROTECTIVE DEVICES (SPD)

Provide SPD labeled in accordance with the latest editions of UL 1283 and 1449, including the highest fault current of section 37.3 (UL recognized for integral).

SPD shall meet or exceed the following criteria:

UL 1449 ratings: the system performance ratings shall be based on the UL 1449 listing ratings for IEEE C62.41 category C3 impulse waveforms of 6kv 1.2 x 50 microsecond, 3ka, 8 x 20 microsecond waveshapes. The maximum UL 1449 listed surge rating for each and/or all of the specified protection modes shall not be exceeded.

Maximum surge current capability (single pulse rated) per phase shall be:

Service entrance switchboards, switchgear: 240ka.

Distribution panelboards, panelboards used for service entrance & MCC: 120ka.

Branch panelboards: 80ka (non-modular is acceptable).

UL 1449 listed and recognized component suppression voltage ratings shall not exceed the following:

VOLTAGE L-N L-G N-G

208y/120 330v 330v 330v

480y/277 700v 700v 700v

SPD shall have a minimum EM/RFI filtering of -50db at 100kHz.

Indicators: the SPD shall use LED indicators that provide indication of suppression component failure in all protection modes including N-G, as well as optically isolated N/C dry contacts for remote monitoring.

Transient counter: a transient voltage surge counter shall be included to totalize transient voltage surges which deviate from the sine wave envelope by more than 125v. The readout shall be at least a six digit LCD located on the unit's hinged front cover. The counter shall be equipped with a battery back-up to retain memory when power is not present. A push-button switch on the display's face-plate shall be provided for manual counter reset.

Manufacturers: Cutler hammer, General Electric, Siemens, Square D, APT, Surge Suppression Incorporated.

Switchboard, switchgear, panelboard and MCC internally mounted SPD: factory installed, UL-labeled by, and at the facility of the electrical distribution equipment manufacturer.

Externally mounted SPD (only allowed where noted on the construction documents): install with conductors as short and straight as possible. Twist the SPD input conductors together to reduce input conductor inductance. Follow the SPD manufacturer's recommended installation practices and comply with all applicable codes.

Warranty: the manufacturer shall provide a minimum full five year parts, labor, travel warranty from date of substantial completion against any part failure, excluding breakers, when installed in compliance with manufacturer's written instructions, UL listing requirements, and all applicable national or local electrical codes. Manufacturer shall make available local, national field engineering service support. Where direct factory employed service engineers are not locally available, travel time from the factory or nearest dispatch center shall be stated.

Thoroughly factory test the specified system before shipment. Testing of each system shall include, but shall not be limited to, quality control checks, dielectric voltage withstand tests at twice rated voltage plus 1000v per UL requirements, and operational and calibration tests.

26B 4 LIGHT FIXTURES, LAMPS AND BALLASTS

26B 4-1 LIGHT FIXTURE LOCATIONS

Light fixtures shown on the electrical drawings represent general arrangements only. Refer to architectural drawings for more exact locations. Coordinate location with all other trades before installation to avoid conflicts. Coordinate light fixture locations in mechanical rooms with final installed piping and ductwork layouts.

26B 4-2 LIGHT FIXTURES

Provide light fixtures as scheduled on drawings, including all lamps, all necessary accessories, material and labor to security hang, clean, and make light fixtures completely ready for use. Provide: all hangers, supports, and miscellaneous hardware required to install light fixtures; proper trim to fit each ceiling condition actually encountered; additional tie wires connected to structure to conform to seismic requirements where required by the applicable building code.

Packaging of light fixtures will not be allowed. Only those luminaires listed in the light fixture schedule, or approved in accordance with substitutions of these specifications, will be accepted. Where the light fixture schedule indicates an allowance for a specific light fixture, the price is a contractor price. Include all additional costs for freight, lamps, and installation of light fixture and lamps.

Install all fluorescent light fixtures located in areas without ceilings immediately below the roof-framing members, or suspended from chain