

SPECIFICATIONS - ELECTRICAL

260100 - BASIC ELECTRICAL SCOPE OF WORK REQUIREMENTS:

- A. ALL WORK SHALL BE IN COMPLIANCE WITH THE LATEST APPLICABLE CODES, LAWS AND ORDINANCES AND THE NATIONAL ELECTRICAL CODE. PROVIDE AND INSTALL ALL LABOR, MATERIALS, PERMITS AND INCIDENTALS REQUIRED TO COMPLETE ALL WORK AS SHOWN ON CONTRACT DOCUMENTS.
- B. DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL SCOPE AND ARRANGEMENT OF THE ELECTRICAL INSTALLATION AND ARE NOT INTENDED TO SHOW EVERY CONNECTION. CONDUIT OR EXACT LOCATION AND EXTENT OF WORK. CONTRACTOR SHALL INSTALL THE WORK COMPLETE, INCLUDING DETAILS AND EQUIPMENT NECESSARY TO PERFORM THE FUNCTION INDICATED ON THE DRAWINGS. SUBMIT SHOP DRAWINGS FOR ALL ELECTRICAL EQUIPMENT ASSOCIATED WITH THE PROJECT UNDER ONE SUBMITTAL. SEPARATE SUBMITTALS MAY BE REJECTED. SUBMIT DIMENSIONED ELECTRICAL ROOM LAYOUTS TO 1/4" SCALE WITH MANUFACTURERS EQUIPMENT LOCATIONS SHOWN THEREIN.
- C. ALL MATERIALS SHALL BE NEW AND FREE OF DEFECTS AND SHALL BE U.L. LISTED OR BE LISTED WITH AN APPROVED, NATIONALLY RECOGNIZED ELECTRICAL TESTING AGENCY.
- D. INSPECT ALL NEW MATERIAL AND EQUIPMENT PRIOR TO INSTALLATIONS FOR DAMAGES AND SHALL VERIFY EQUIPMENT OPERATES SATISFACTORILY.
- E. WARRANT ALL MATERIAL AND EQUIPMENT FURNISHED TO COMPLETE ALL WORK FOR ONE YEAR AFTER FINAL ACCEPTANCE OF COMPLETION. MATERIALS AND EQUIPMENT DEFECTS OF FAILURES DUE TO ABUSE OR WORKMANSHIP NEGLIGENCE SHALL BE MADE GOOD BY THE CONTRACTOR WITHOUT COST TO THE OWNER.
- F. PROVIDE ONLY NEW, STANDARD UNDERWRITERS' LABORATORY INC. LISTED FIRST-GRADE MATERIALS THROUGHOUT AND SHALL BE MARKED WITH UNDERWRITERS LABORATORY INC. LISTED AND WITH MANUFACTURER'S BRAND OR TRADEMARK. ALL MATERIALS SHALL BE OF ONE MANUFACTURER.
- G. CONTRACTOR SHALL BE EXPERIENCED IN THEIR TRADE. CONTRACTOR'S WORK SHALL PRESENT A NEAT APPEARANCE UPON COMPLETION. MATERIALS AND EQUIPMENT INSTALLED SHALL BE PLUMB, STRAIGHT AND LEVEL.
- H. COORDINATE WITH THE ARCHITECT AND OWNER ON EXACT LOCATION OF WIRING DEVICES AND RACEWAYS FOR OWNER-FURNISHED EQUIPMENT PRIOR TO ROUGH-IN. COORDINATE ELECTRICAL EQUIPMENT AND MATERIALS INSTALLATION WITH OTHER BUILDING COMPONENTS AND TRADES. REVIEW AND COORDINATE BETWEEN ALL CONSTRUCTION DOCUMENTS AND PROJECT SPECIFICATIONS.
- I. COORDINATE THE INSTALLATION OF REQUIRED SUPPORTING DEVICES AND SLEEVES TO BE SET IN POURED IN PLACE CONCRETE AND OTHER STRUCTURAL COMPONENTS AS THEY ARE CONSTRUCTED. COORDINATE THE CUTTING AND PATCHING OF BUILDING COMPONENTS TO ACCOMMODATE THE INSTALLATION OF ELECTRICAL EQUIPMENT AND MATERIALS IN RENOVATION PROJECTS.
- J. COORDINATE CONNECTION OF ELECTRICAL SYSTEMS AND EQUIPMENT REQUIREMENTS WITH LOCAL UTILITY SERVICES TO PROVIDE AND COMPLY WITH THE REQUIREMENTS FOR EACH SERVICE.
- K. UPON COMPLETION OF WORK, TEST ALL WIRING AND EQUIPMENT INSTALLATION AND SHALL BE IN PERFECT WORKING CONDITION IN ACCORDANCE WITH THE INTENT OF THE CONTRACT DOCUMENTS. MARK DRAWINGS TO INDICATE ACTUAL FIELD CONDITIONS.
- L. THE WORD 'PROVIDE' MEANS FOR THE CONTRACTOR TO FURNISH AND INSTALL.

260519 - CONDUCTORS AND CABLES:

- A. WIRING GENERAL: CONDUCTORS SHALL BE COPPER AND HAVE CURRENT CARRYING CAPACITIES AS PER N.E.C. WITH 600 VOLT INSULATION AND COMPLY WITH NEMA WC 70. ALUMINUM CONDUCTORS ARE NOT APPROVED. CONDUCTORS SHALL BE #12 MINIMUM, EXCEPT FOR CONTROLS AND FIXTURE WIRE. SOLID FOR #10 AND SMALLER CONDUCTORS, STRANDED FOR #8 AND LARGER.
- B. FEEDERS, BRANCH CIRCUITS, CLASS 1 AND CLASS 2 CIRCUITS SHALL BE INSULATION TYPE XHHW OR THWN.
- C. MAINTAIN STANDARD COLOR CODING OF BLACK, RED AND BLUE FOR 120/208 VOLT, 3 PHASE WIRING AND BROWN, ORANGE AND YELLOW FOR 277/480 VOLT, 3 PHASE WIRING. COLOR CODING SHALL MATCH EXISTING FACILITIES WHERE THE COLOR CODING IS NOT STANDARD. WHITE NEUTRAL AND GREEN GROUND.
- D. CONCEAL CABLES IN FINISHED WALLS, CEILINGS AND FLOORS UNLESS OTHERWISE INDICATED. INSTALL EXPOSED CABLES PARALLEL AND PERPENDICULAR TO SURFACES OF EXPOSED STRUCTURAL MEMBERS AND FOLLOW SURFACE CONTOURS WHERE POSSIBLE.
- E. MAKE SPLICES AND TAPS THAT ARE COMPATIBLE WITH CONDUCTOR MATERIAL AND THAT POSSESS EQUIVALENT OR BETTER MECHANICAL STRENGTH AND INSULATION RATINGS THAN UNSPLICED CONDUCTORS. SERVICE ENTRANCE AND PANEL FEEDERS SHALL NOT BE SPLICED. TIGHTEN ELECTRICAL CONNECTORS AND TERMINALS ACCORDING TO MANUFACTURER'S PUBLISHED TORQUE/TIGHTENING VALUES. IF MANUFACTURER'S TORQUE VALUES ARE NOT INDICATED, USE THOSE SPECIFIED IN UL 468A AND UL 468B.
- F. WIRING AT OUTLETS: INSTALL CONDUCTOR AT EACH OUTLET WITH AT LEAST 12 INCHES OF SLACK. WIRING IN LIGHT POLE HANDHOLES: PROVIDE AT LEAST 18" OF SLACK AT HANDHOLE.

260526 - GROUNDING AND BONDING:

- A. GROUNDING SHALL BE INSTALLED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE AND LOCAL CODES AND REQUIREMENTS.
- B. FEEDERS AND BRANCH CIRCUITS SHALL HAVE INSTALLED IN THE SAME RACEWAY AS THE CIRCUIT CONDUCTORS, AN INSULATED COPPER GROUNDING CONDUCTOR SIZED IN ACCORDANCE WITH NEC.
- C. DESCRIPTION OF SYSTEM: IN GENERAL, ALL ELECTRICAL EQUIPMENT (METALLIC CONDUIT, MOTOR FRAMES, PANEL BOARDS, ETC.) SHALL BE BONDED TOGETHER WITH A GREEN INSULATED OR BARE COPPER SYSTEM GROUNDING CONDUCTOR IN ACCORDANCE WITH SPECIFIC RULES OF ARTICLE 250 OF THE N.E.C. EQUIPMENT GROUNDING CONDUCTORS THROUGH THE RACEWAY. SYSTEM SHALL BE CONTINUOUS FROM MAIN SWITCH GROUND BUS TO PANEL GROUND BAR OF EACH PANEL BOARD AND FROM PANEL GROUNDING BAR OF EACH PANEL BOARD TO BRANCH CIRCUIT EQUIPMENT AND DEVICES. CONNECTORS LISTED AND LABELED BY A NATIONALLY RECOGNIZED TESTING LABORATORY ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION FOR APPLICATIONS IN WHICH USE AND FOR SPECIFIC TYPES, SIZES AND COMBINATIONS OF CONDUCTORS AND OTHER ITEMS CONNECTED. ALL FEEDER METALLIC CONDUITS AND FLEXIBLE METAL CONDUITS CONNECTIONS TO PANEL, CABINETS, EQUIPMENT CABINETS, TRANSFORMER ENCLOSURES, ETC. SHALL BE PROVIDED WITH GROUNDING BUSHINGS.
- D. ELECTRICAL ROOM GROUND BUSS BARS: NEWTON INSTRUMENT COMPANY INSULATED GROUND BAR, MINIMUM SIZE 1/4" x 4" x 10", COPPER, MANUFACTURER PRE-DRILLED HOLES. ALL GROUND BUSS BARS SHALL BE BONDED TO MAIN ELECTRICAL GROUND BUSS BAR WITH MINIMUM 30 COPPER GROUND OR SIZED PER CODE FOR A CONTINUOUS COPPER GROUNDING SYSTEM. UTILIZING BUILDING STEEL OR FOOTING IS NOT ACCEPTABLE. TELECOMMUNICATIONS, IDF, DATA, COMPUTER AND SIMILAR ROOMS: NEWTON INSTRUMENT COMPANY INSULATED GROUND BAR, 1/4" x 4" x 20", COPPER, MANUFACTURER PRE-DRILLED HOLES. BOND GROUND BUSS BAR TO MAIN ELECTRICAL GROUND BUSS BAR WITH MINIMUM 30 AWG COPPER.
- E. GROUNDING RODS: COPPER-CLAD STEEL, SECTIONAL TYPE, 3/4" INCH IN DIAMETER x 10 FEET. PROVIDE ADDITIONAL LENGTHS IN 10 SECTIONS TO ACHIEVE SPECIFIED MINIMUM RESISTANCE TO GROUND, MEASURED IN OHMS, AT BUILDING SERVICES GROUNDING SYSTEMS. EXOTHERMIC CADWELD SHALL BE USED FOR BUILDING GROUNDING SYSTEM CONNECTION TO DRIVEN GROUND RODS.
- F. GROUNDING AND BONDING FOR PIPING: METAL WATER SERVICE PIPE: INSTALL INSULATED COPPER GROUNDING CONDUCTORS, IN CONDUIT, FROM BUILDING'S MAIN SERVICE EQUIPMENT OR GROUNDING BUSS, TO MAIN METAL WATER SERVICE ENTRANCES TO BUILDING. BOND EACH ABOVE GROUND PORTION OF GAS PIPING SYSTEM DOWNSTREAM FROM EQUIPMENT SHUT-OFF VALVE. CONCRETE ENCASED ELECTRODE IN BUILDING FOOTER SHALL BE A BARE CONDUCTOR, SAME SIZE AS THE BUILDING SYSTEMS GROUNDING CONDUCTOR, ROUTED MINIMUM 20' AND TIE WIRED TO THE REINFORCING BARS.
- G. PERFORM GROUNDING TEST: PERFORM TESTS BY FALL-OF-POTENTIAL METHOD ACCORDING TO IEEE 81, USING MEGOHMMETER. REPORT MEASURED GROUND RESISTANCES THAT EXCEED 5 OHMS. EXCESSIVE GROUND RESISTANCE: IF RESISTANCE TO GROUND EXCEEDS 5 OHMS, PROVIDE ADDITIONAL DRIVEN GROUNDING RODS UNTIL THE MEASURED GROUND RESISTANCE DOES NOT EXCEED 5 OHMS.

260529 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS:

- A. HANGERS AND SUPPORTS FOR ELECTRICAL EQUIPMENT AND RACEWAYS SHALL COMPLY WITH THE NEC AND NECA 1 AND NECA 101. SPACE SUPPORTS FOR EMT, IMC AND RMC AS REQUIRED BY THE NEC. MINIMUM ROD SIZE SHALL BE 1/4 INCH IN DIAMETER.
- B. CONDUIT AND CABLE SUPPORT DEVICES: STEEL HANGERS, CLAMPS AND ASSOCIATED FITTINGS, DESIGNED FOR TYPES AND SIZES OF RACEWAY OR CABLE TO BE SUPPORTED. EXTERIOR AND WET LOCATIONS SHALL BE STAINLESS STEEL OR ALUMINUM WITH STAINLESS STEEL HARDWARE.
- C. SUPPORT FOR CONDUCTORS IN VERTICAL CONDUIT: FACTORY - FABRICATED ASSEMBLY CONSISTING OF THREADED BODY AND INSULATING WEDGING PLUG OR PLUGS FOR NON-ARMORED ELECTRICAL CONDUCTORS OR CABLES IN RISER CONDUITS. PLUGS SHALL HAVE NUMBER, SIZE AND SHAPE OF CONDUCTOR GRIPPING PIECES AS REQUIRED TO SUIT CABLES SUPPORTED.
- D. MOUNTING, ANCHORING AND ATTACHMENT COMPONENTS: ITEMS FOR FASTENING ELECTRICAL ITEMS OR THEIR SUPPORTS TO BUILDING SURFACES INCLUDE: MECHANICAL EXPANSION ANCHORS, INSERT - WEDGE TYPE, ZINC-COATED STEEL OR STAINLESS STEEL FOR USE IN HARDENED PORTLAND CEMENT CONCRETE WITH TENSION, SHEAR AND PULLOUT CAPACITIES APPROPRIATE FOR SUPPORTED LOADS AND BUILDING MATERIALS IN WHICH USED. CONCRETE INSERTS, STEEL OR MALLEABLE-IRON, SLOTTED SUPPORT SYSTEM UNITS SIMILAR TO MSS TYPE 18, COMPLYING WITH MFMA-4 OR MSS SP-58. CLAMPS FOR ATTACHMENT TO STEEL STRUCTURAL ELEMENTS, MSS SP-58, TYPE SUITABLE FOR ATTACHED STRUCTURAL ELEMENT, THROUGH BOLTS, STRUCTURAL TYPE, HEX HEAD AND HIGH STRENGTH, COMPLY WITH ASTM A-325, TOGGLE BOLTS, ALL STEEL SPRINGHEAD TYPE. HANGER RODS, THREADED STEEL. MOUNTING APPARATUS FOR EXTERIOR APPLICATIONS SHALL BE STAINLESS STEEL. EXTERIOR LOCATED SUPPORT APPARATUS SHALL CONSIST OF DIRECT BURIAL CONCRETE POSTS, STAINLESS STEEL OR ALUMINUM CHANNEL AND STAINLESS STEEL SPRINGS, BOLTS, WASHERS, ETC.
- E. MULTIPLE RACEWAYS OR CABLES SHALL HAVE L-TRAPEZIE TYPE SUPPORTS FABRICATED WITH STEEL SLOTTED OR OTHER SUPPORT SYSTEM, SIZED SO CAPACITY CAN BE INCREASED BY AT LEAST 25 PERCENT IN FUTURE WITHOUT EXCEEDING SPECIFIED DESIGN LOAD LIMITS. SECURE RACEWAYS AND CABLES TO THESE SUPPORTS WITH TWO-BOLT CONDUIT CLAMPS USING SPRING FRICTION ACTION FOR RETENTION IN SUPPORT CHANNEL. SPRING-STEEL CLAMPS DESIGNED FOR SUPPORTING SINGLE CONDUITS WITHOUT BOLTS MAY BE USED FOR 1-1/2 INCH AND SMALLER RACEWAYS SERVING BRANCH CIRCUITS AND COMMUNICATION SYSTEMS ABOVE SUSPENDED CEILINGS.
- F. SUPPORTING RACEWAYS VIA OTHER RACEWAYS CABLE TRAYS AND WIREWAYS ARE NOT APPROVED.

260533 - RACEWAYS AND BOXES:

- A. LISTING AND LABELING: METAL CONDUITS AND NON-METALLIC CONDUITS, TUBING AND FITTINGS SHALL BE LISTED AND LABELED AS DEFINED IN NFPA 70 AND MARKED FOR INTENDED LOCATION AND APPLICATION. CONDUIT GENERAL: RIGID SHALL BE MINIMUM 1", GALVANIZED OUTSIDE AND INSIDE BY HOT DIPPING, E.M.T. SHALL BE MINIMUM 3/4" AND SHALL BE ELECTRO-GALVANIZED, PROVIDE MINIMUM 1" CONDUIT WITH 4" SQUARE BACK BOX FOR DATA.
- B. CONDUITS SHALL BE AS MANUFACTURED BY ALLED, PITTSBURGH STANDARD, REPUBLIC, THOMAS & BETTS, TRIANGLE, WHEATLAND OR YOUNGSTOWN.
- C. PROVIDE END BUSHINGS ON ALL CONDUITS. PROVIDE PULL STRINGS IN ALL EMPTY RACEWAYS. PULL STRINGS SHALL BE NYLON AND SHALL BE IMPERVIOUS TO MOST ACIDS. PULL STRINGS SHALL BE TENSILE STRENGTH OF LESS THAN 200 LBS. METALLIC RACEWAY MAY BE BONDED TO CABINETS, BOXES AND PANELBOARDS BY DOUBLE LOCKNUT AND BUSHING TO ENSURE THE METALLIC PARTS ARE ALL EFFECTIVELY GROUNDED.
- D. CONDUIT ABOVE GRADE OR CONCEALED IN WALLS SHALL BE EMT (INTERIOR ONLY), IMC OR GALVANIZED. CONDUIT BELOW GRADE SHALL BE RIGID GALVANIZED (HEAVY WALL), IMC OR PVC (SCHEDULE 40). CONNECTION TO VIBRATING EQUIPMENT, (INCLUDING TRANSFORMERS AND HYDRAULIC, PNEUMATIC, ELECTRIC SOLENOID OR MOTOR-DRIVEN EQUIPMENT), FMC, EXCEPT USE EMT IN DAMP OR WET LOCATIONS, MAXIMUM LENGTH 72 INCHES. CONCEAL CONDUIT WITHIN FINISH WALLS, CEILINGS AND FLOORS UNLESS OTHERWISE INDICATED.
- E. CONDUIT OUTSIDE AND EXPOSED TO PHYSICAL DAMAGE OR IN DAMP OR WET LOCATIONS SHALL BE RIGID GALVANIZED (HEAVY WALL).
- F. SEALANT: PROVIDE A CLOSED CELL SILICONE FOAM SEALANT RATED TO PROVIDE A RATING EQUAL TO THE WALL, CEILING OR FLOOR OF THE ASSEMBLY. PROVIDE SEALS FOR THE EXTERIOR OF CONDUIT PENETRATIONS CONSISTING OF A CAST-IN-PLACE SLEEVE WITH A COMPRESSIBLE RUBBER GASKET BETWEEN THE CONDUIT AND THE SLEEVE. PROVIDE SEALS FOR THE INTERIOR OF THE CONDUIT PENETRATIONS CONSISTING OF GLAND TYPE SEALING BUSHING OR CLOSED CELL SILICONE FOAM. PROVIDE DUCT SEAL INSIDE AN APPROPRIATE SEAL-OFF FITTING TO SEAL THE INTERIOR OF THE CONDUIT SYSTEM FROM WATER SEEPAGE OR HAZARDOUS GASES.
- G. COUPLINGS, ALL COUPLINGS AND CONNECTORS FOR EMT SHALL BE OF COMPRESSION TYPE.
- H. OUTLET SHALL BE STANDARD TYPE WITH NOCKOUTS, MADE OF HOT DIPPED GALVANIZED STEEL AS MANUFACTURED BY STEEL CITY, RACO OR APLETON. BOX EXTENSIONS USED TO ACCOMMODATE NEW BUILDING FINISHES SHALL BE OF SAME MATERIAL AS RECESSED BOX.
- I. CEILING OUTLET BOXES SHALL BE 4 INCH OCTAGON, 1-1/2 INCH DEEP OR LARGER WHEN REQUIRED DUE FOR NUMBER OF CONDUCTORS OR CONDUIT ENTRY. LUMINAIRE OUTLET BOXES: NON-ADJUSTABLE, DESIGNED FOR ATTACHMENT OF LUMINAIRE WEIGHING 50 LB. OUTLET BOXES DESIGNED FOR ATTACHMENT OF LUMINAIRES WEIGHING MORE THAN 50 LB. SHALL BE LISTED AND MARKED FOR THE MAXIMUM ALLOWABLE WEIGHT.
- J. OUTLET BOXES SHALL BE PROVIDED WITH APPROVED 3/8 INCH FIXTURE STUDS WHERE REQUIRED. PROVIDE JUNCTION OR PULL BOXES WHERE SHOWN ON THE DRAWINGS AS REQUIRED TO FACILITATE INSTALLING CONDUCTORS. BOXES SHALL BE SIZED IN ACCORDANCE WITH THE NEC. ALL JUNCTION BOXES SHALL BE ACCESSIBLE, HORIZONTALLY SEPARATE BOXES MOUNTED ON OPPOSITE SIDES OF WALLS SO THEY ARE NOT IN THE SAME VERTICAL CHANNEL AND TO MAINTAIN WALL FIRE RATING.
- K. METAL FLOOR BOXES: CAST METAL FOR SLAB ON GRADE OR SHEET METAL, FULLY ADJUSTABLE, RECTANGULAR. METAL FLOOR BOXES SHALL BE LISTED AND LABELED AS DEFINED IN NFPA 70, BY A QUALIFIED TESTING AGENCY AND MARKED FOR INTENDED LOCATION AND APPLICATION.

260544 - SLEEVES AND SEALS FOR ELECTRICAL RACEWAYS AND CABLING:

- A. COORDINATE SLEEVE SELECTION AND APPLICATION FOR RACEWAYS AND CABLES THROUGH FIRE RATED PENETRATIONS WITH THROUGH-PENETRATION FIRESTOP SYSTEMS' SPECIFIED IN ARCHITECTURAL DRAWINGS AND SPECIFICATIONS. FOR FIRE-RATED ASSEMBLY PENETRATIONS, MAINTAIN INDICATED FIRE RATINGS OF WALLS, PARTITIONS, CEILINGS AND FLOORS AT CABLE PENETRATIONS. INSTALL SLEEVES AND SEAL WITH FIRESTOP MATERIALS ACCORDING TO LISTING.
- B. SLEEVE INSTALLATION FOR NON-FIRE-RATED ELECTRICAL PENETRATIONS: WALL SLEEVES, GALVANIZED-STEEL SHEET, 0.0239 INCH MINIMUM THICKNESS; ROUND TUBE CLOSED WITH TABS FOR SCREW-FASTENING THE SLEEVE TO THE BOARD. SLEEVES FOR RECTANGULAR OPENINGS: FOR SLEEVE CROSS-SECTION RECTANGLE PERIMETER LESS THAN 50 INCHES AND WITH NO SIDE LARGER THAN 16 INCHES, THICKNESS SHALL BE 0.052 INCH FOR SLEEVE CROSS-SECTION RECTANGLE PERIMETER 50 INCHES OR MORE AND ONE OR MORE SIDES LARGERS THAN 16 INCHES, THICKNESS SHALL BE 0.138 INCH. CUT SLEEVES TO LENGTH FOR MOUNTING FLUSH WITH BOTH WALL SURFACES. EXTEND SLEEVES INSTALLED IN FLOORS 2 INCHES ABOVE FINISHED FLOOR LEVEL. SIZE PIPE SLEEVES TO PROVIDE 1/4 INCH ANNULAR CLEAR SPACE BETWEEN SLEEVE AND CABLE UNLESS SLEEVE SEAL IS TO BE INSTALLED. SEAL SPACE OUTSIDE OF SLEEVES WITH GROUT FOR PENETRATIONS OF CONCRETE AND MASONRY AND WITH APPROVED JOINT COMPOUND FOR GYPSUM BOARD ASSEMBLIES. ROOF PENETRATION SLEEVES - SEAL PENETRATION OF INDIVIDUAL CABLES WITH FLEXIBLE BOOT-TYPE FLASHING UNITS APPLIED IN COORDINATION WITH ROOFING WORK. ABOVE GROUND EXTERIOR WALL PENETRATIONS - SEAL PENETRATIONS USING SLEEVES AND MECHANICAL SLEEVE SEALS AND SLEEVES TO ALLOW FOR 1 INCH ANNULAR CLEAR SPACE BETWEEN PIPE AND SLEEVE FOR INSTALLING MECHANICAL SLEEVE SEALS. UNDERGROUND EXTERIOR-WALL PENETRATIONS - INSTALL CAST-IRON WALL PIPES FOR SLEEVES, SIZE SLEEVES TO ALLOW FOR 1 INCH ANNULAR CLEAR SPACE BETWEEN CABLE AND SLEEVE FOR INSTALLING MECHANICAL SLEEVE SEALS.

2605600 - EXTERIOR LIGHTING:

- A. LUMINAIRES SHALL BE FURNISHED AS SHOWN IN THE LUMINAIRE SCHEDULE AND COMPLY WITH UL 1598 AND BE LISTED AND LABELED FOR INSTALLATION IN WET LOCATIONS AS DEFINED IN NFPA 70 AND MARKED FOR INTENDED LOCATION AND APPLICATION. LATERAL LIGHT DISTRIBUTION SHALL COMPLY WITH IESNA RP-8. THE CONTRACTOR SHALL FURNISH STAINLESS STEEL MOUNTING HARDWARE AND REQUIRED ACCESSORIES OF THE SPECIFIED AND / OR APPROVED FIXTURES.
- B. LED LUMINAIRES SHALL BE UL 8750 LISTED AND TESTED IN ACCORDANCE WITH LM-79 AND LM-80 STANDARDS. THE LED LUMINAIRE SHALL HAVE A LUMINOUS EFFICACY OF AT LEAST 90 LUMENS/W, A COLOR TEMPERATURE OF 3500K OR 4000K, A CRI OF AT LEAST 80, AN ESTIMATED LIFE OF AT LEAST 50,000 HOURS AT L70 LUMEN MAINTENANCE AND SHALL INCLUDE A MINIMUM 5-YEAR WARRANTY ON THE ENTIRE LUMINAIRE INCLUDING THE DRIVER.
- A. LUMINAIRES SHALL BE LISTED AND LABELED AS DEFINED IN NFPA 70, BY A QUALIFIED TESTING AGENCY AND MARKED FOR INTENDED LOCATION AND APPLICATION. PANELBOARDS SHALL BE AS MANUFACTURED BY COOPER BUSSMANN, FERRAS SHAWMUT, LITTLEFUSE OR EDISON. FUSES SHALL BE NON-RENEWABLE CARTRIDGE TYPE RATED 600 V AC AND LESS FOR USE IN ENCLOSED SWITCHES, FUSIBLE PANELBOARDS, SWITCHBOARDS, ENCLOSURE CONTROLLERS, MOTOR CONTROL CENTERS AND CONTROL CIRCUITS.
- B. FUSE APPLICATIONS: SERVICE ENTRANCE, CLASS L, TIME DELAY. FEEDERS, CLASS RK5, FAST ACTING. MOTOR BRANCH CIRCUITS AND OTHER BRANCH CIRCUITS: CLASS RK5, TIME DELAY. CONTROL CIRCUITS: CLASS CC, TIME DELAY.
- C. INSTALLATION: INSTALL FUSES IN FUSIBLE DEVICES. ARRANGE FUSES SO RATING INFORMATION IS READABLE WITHOUT REMOVING FUSE. FUSES SHALL BE SIZED IN ACCORDANCE WITH THE MANUFACTURER'S MAXIMUM OVER-CURRENT NAMEPLATE RATING.

260553 - ELECTRICAL IDENTIFICATION:

- A. NAMEPLATES: ENGRAVED PLASTIC LAMINATE NAMEPLATES: PROVIDE ENGRAVING PHENOLIC PLASTIC LAMINATE IN SIZES AND THICKNESS INDICATED, ENGRAVED WITH 1/16 INCH THICK LINES WITH SQUARE STANDARD PICA LETTERING AND WORDING AS SPECIFIED HEREIN, BLACK FACE AND WHITE LETTER FOR NORMAL SYSTEMS AND RED AND WHITE FOR EMERGENCY AND FIRE ALARM SYSTEMS. PUNCH FOR MECHANICAL FASTENING, EXCEPT WHERE ADHESIVE MOUNTING IS NECESSARY BECAUSE OF SUBSTRATE. MATERIAL THICKNESS SHALL BE 1/16 INCH. PROVIDE BEVELED EDGE IN ORDER TO MAINTAIN SHARP CORNERS. PROVIDE SHARP CORNERS. PROVIDE SHARP CORNERS. PROVIDE CONTACT TYPE PERMANENT ADHESIVE WHERE SCREWS CANNOT OR SHALL NOT PENETRATE THE SUBSTRATE. ADHESIVE NAMEPLATE SHALL BE PERMANENTLY INSTALLED. TITLES SHALL BE 1/2" INCH HIGH AND ALL OTHER LETTERING SHALL BE 1/4 INCH HIGH.
- B. JUNCTION BOX IDENTIFICATION: PROVIDE NEAT INDELEIBLE FELT TIP, STENCILED MARKING ON JUNCTION BOXES. LETTER SIZES SHALL BE 1 INCH HIGH MINIMUM. PROVIDE NON-STENCILED MARKINGS INSIDE THE JUNCTION BOX. LABEL TO INDICATE THE CIRCUITS CONTAINED THEREIN.
- C. PULLBOX IDENTIFICATION: PROVIDE NEAT INDELEIBLE FELT TIP, STENCILED MARKING ON PULLBOX COVERS. LETTER SIZES SHALL BE 1 INCH HIGH MINIMUM. PROVIDE NON-STENCILED MARKINGS INSIDE THE PULLBOX AND ON THE EXTERIOR EDGE TO MATCH THE COVER MARKINGS. LABEL TO INDICATE THE CIRCUITS CONTAINED THEREIN, SOURCE PANEL AND DESTINATION.

262416 - PANELBOARDS:

- A. ELECTRICAL COMPONENTS, DEVICES AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA 70 BY A QUALIFIED TESTING AGENCY AND MARKED FOR INTENDED LOCATION AND APPLICATION. PANELBOARDS SHALL BE AS MANUFACTURED BY EATON, GENERAL ELECTRIC, SIEMENS OR SQUARE D.
- B. PROVIDE PANELBOARDS WITH MAIN BREAKER OR MAIN LBS WHERE SHOWN ON THE DRAWINGS, OF A DEAD FRONT, DISTRIBUTED PHASE SEQUENCE DESIGN. PROVIDE WITH COPPER BUSES. PANELBOARDS SHALL BE EQUIPPED WITH HINGED TRIM FRONT COVER AND KEYS ALIKE. PANELBOARDS CAN BE EITHER FULLY RATED OR SERIES RATED.
- C. DISTRIBUTION TYPE PANELBOARDS SHALL BE USED FOR 800 AMP AND LARGER PANELBOARDS. CIRCUIT BREAKERS AND MAIN CIRCUIT BREAKERS SHALL BE ELECTRONIC TRIP CIRCUIT BREAKERS WITH RMS SENSING. FIELD REPLACEABLE RATING PLUS OR ELECTRONIC TRIP WITH FIELD ADJUSTABLE SETTINGS FOR INSTANTANEOUS TRIP, LONG AND SHORT-TIME PICKUP AND ADJUSTABLE LEVELS. FRAME AND TRIP SIZES INDICATED IN THE SCHEDULES. MAIN CIRCUIT BREAKERS SHALL BE 100 PERCENT RATED MAINS.
- D. LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS SHALL BE USED FOR 400 AMP AND SMALLER PANELBOARDS UNLESS OTHERWISE NOTED. CIRCUIT BREAKERS SHALL BE BOLT-ON QUICK-MAKE, QUICK-BREAK THERMAL-MAGNETIC TYPE WITH FRAME AND TRIP SIZES INDICATED IN THE SCHEDULES. ADJUSTABLE MAGNETIC TRIP SETTING FOR CIRCUIT-BREAKER FRAME SIZES 250 AMP AND LARGER. BREAKERS SHALL TRIP FREE OF THE HANDLE AND TRIPPING SHALL BE INDICATED BY THE HANDLE ASSUMING A POSITION BETWEEN OFF AND ON. MULTI-POLE BREAKERS SHALL BE INTERNAL, COMMON TRIP WITH SINGLE OPERATING HANDLE. EXTERNAL HANDLE TIES ARE NOT ACCEPTABLE.
- E. FOR FLUSH MOUNTED PANELBOARDS STUB FOUR (4) 1 INCH EMPTY CONDUITS FROM PANELBOARD INTO ACCESSIBLE CEILING SPACE OR SPACE DESIGNATED TO BE CEILING SPACE IN THE FUTURE. ARRANGE CONDUCTORS IN GUTTERS INTO GROUPS AND BUNDLE AND WRAP WITH WIRE TIES.
- F. FIELD QUALITY CONTROL: PERFORM TESTS AND INSPECTIONS. TEST INSULATION RESISTANCE FOR EACH PANELBOARD BUSS, COMPONENT, CONNECTING SUPPLY, FEEDER AND CONTROL CIRCUIT. TEST CONTINUITY OF EACH CIRCUIT. PERFORM EACH VISUAL AND MECHANICAL INSPECTION AND ELECTRICAL TEST STATED IN NETA ACCEPTANCE TESTING SPECIFICATION. CERTIFY COMPLIANCE WITH TEST PARAMETERS AND CORRECT MALFUNCTIONING UNITS ON-SITE, WHERE POSSIBLE AND RE-TEST TO DEMONSTRATE COMPLIANCE; OTHERWISE, REPLACE WITH NEW UNITS AND RE-TEST.
- G. DIRECTORIES: A TYPE PANELBOARD DIRECTORY SHALL BE PROVIDED FOR EACH PANELBOARD AND SHALL INDICATE THE ACTUAL CIRCUIT NUMBER USED, ROOM NAME AND TYPE OF LOAD. ROOM NAMES SHALL BE THE ACTUAL NAME OR ROOM NUMBER USED NOT NECESSARILY AS SHOWN ON THE DRAWINGS. WHERE PANEL SCHEDULES ARE INDICATED ON THE DRAWINGS AS 'RECEPTACLES' OR 'LIGHTING', ETC. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO INCLUDE THE SPECIFIC AREA SERVED.

262726 - WIRING DEVICES:

- A. WIRING DEVICES, COMPONENTS AND ACCESSORIES SHALL BE LISTED AND LABELED AS DEFINED IN NFPA 70 BY A QUALIFIED TESTING AGENCY AND MARKED FOR INTENDED LOCATION AND APPLICATION. WIRING DEVICES SHALL BE AS MANUFACTURED BY COOPER, HUBBELL, LEVITON OR PASS & SEYMOUR.
- B. PROVIDE WHITE COLORED DEVICES FOR NORMAL POWER, UNLESS OTHERWISE NOTED. PROVIDE RED COLORED DEVICES FOR EMERGENCY POWER. PROVIDE BRUSHED STAINLESS STEEL COVER PLATES. COORDINATE WITH ARCHITECT FOR FINAL COLOR SELECTION OF DEVICES AND COVER PLATES.
- C. RECEPTACLES: SPECIFICATION GRADE 20 AMP, 120 VOLT, 3 WIRE GROUND, MOUNTED AT 18" A.F.F. TO THE CENTERLINE UNLESS NOTED OTHERWISE. COLOR SHALL MATCH TOGGLE SWITCHES.
- D. TOGGLE SWITCHES: HEAVY DUTY SPECIFICATION GRADE 20 AMP, 120/277 VAC, HEAVY DUTY, QUIET TYPE. SINGLE POLE, TWO POLE, THREE WAY OR FOUR WAY AS REQUIRED FOR APPLICATION.
- E. FLUORESCENT DIMMERS: PRESET SLIDE CONTROL, LUTRON OR EQUIVALENT, COMPATIBLE WITH DIMMABLE BALLAST.
- F. OCCUPANCY SENSOR SWITCHES, 120/277 VAC, WALL MOUNTED SINGLE POLE - LEVITON OR EQUIVALENT.
- G. LED DIMMERS: PRESET SLIDE CONTROL, LUTRON OR EQUIVALENT, COMPATIBLE WITH DIMMABLE DRIVER.
- H. INSTALL DEVICE PLATES IN FULL CONTACT WITH WALL SURFACE OR SURFACE MOUNTED BOX. PLATES SHALL NOT PROJECT OUT FROM THE WALL OR FROM THE EDGE OF THE BOX.
- I. ALL DEVICE PLATES FOR RECEPTACLES AND SWITCHES SHALL BE LABELED. SHOW PANEL DESIGNATION AND BRANCH CIRCUIT SERVING EACH RECEPTACLE.

262813 - FUSES:

- A. FUSES SHALL BE LISTED AND LABELED AS DEFINED IN NFPA 70, BY A QUALIFIED TESTING AGENCY AND MARKED FOR INTENDED LOCATION AND APPLICATION. PANELBOARDS SHALL BE AS MANUFACTURED BY COOPER BUSSMANN, FERRAS SHAWMUT, LITTLEFUSE OR EDISON. FUSES SHALL BE NON-RENEWABLE CARTRIDGE TYPE RATED 600 V AC AND LESS FOR USE IN ENCLOSED SWITCHES, FUSIBLE PANELBOARDS, SWITCHBOARDS, ENCLOSURE CONTROLLERS, MOTOR CONTROL CENTERS AND CONTROL CIRCUITS.
- B. FUSE APPLICATIONS: SERVICE ENTRANCE, CLASS L, TIME DELAY. FEEDERS, CLASS RK5, FAST ACTING. MOTOR BRANCH CIRCUITS AND OTHER BRANCH CIRCUITS: CLASS RK5, TIME DELAY. CONTROL CIRCUITS: CLASS CC, TIME DELAY.
- C. INSTALLATION: INSTALL FUSES IN FUSIBLE DEVICES. ARRANGE FUSES SO RATING INFORMATION IS READABLE WITHOUT REMOVING FUSE. FUSES SHALL BE SIZED IN ACCORDANCE WITH THE MANUFACTURER'S MAXIMUM OVER-CURRENT NAMEPLATE RATING.

262816 - ENCLOSED SWITCHES:

- A. GENERAL: ALL DISCONNECT SWITCHES SHALL BE HEAVY-DUTY TYPE, UNLESS SPECIFICALLY NOTED OTHERWISE. SWITCHES SHALL BE FUSIBLE OR NON-FUSIBLE AND SIZED AS NOTED ON THE DRAWINGS.
- B. SWITCHES SHALL BE 240 VOLT RATED ON SYSTEMS UP TO AND INCLUDING 120/240V. ALL SWITCHES SERVING MOTOR LOADS SHALL BE HORSEPOWER RATED. ALL SWITCHES SERVING VFD'S SHALL HAVE AN AUXILIARY CONTACT TO DIS-ENGAGE THE VFD WHEN SWITCHED OFF.
- C. PROVIDE SWITCHES WITH AN EXTERNALLY OPERATED HANDLE. QUICK MAKE QUICK BREAK MECHANISM; THE HANDLE SHALL BE INTERLOCKED WITH THE SWITCH COVER BY MEANS OF A DEFEATABLE INTERLOCK DEVICE. THE SWITCH SHALL BE LOCKABLE IN THE 'OFF' POSITION WITH A PADLOCK.

265100 - INTERIOR LIGHTING:

- A. LUMINAIRES SHALL BE FURNISHED AS SHOWN IN THE LUMINAIRE SCHEDULE AND BE LISTED AND LABELED AS DEFINED IN NFPA 70, BY A QUALIFIED TESTING AGENCY AND MARKED FOR INTENDED LOCATION AND APPLICATION. IT SHALL SPECIFICALLY BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY EXACT TYPE OF CEILING AND RECESSING DEPTH OF ALL RECESSED FIXTURES AND TO FURNISH THE MOUNTING TRIMS AND ACCESSORIES OF THE SPECIFIED AND / OR APPROVED FIXTURES FOR THE CEILING TO BE INSTALLED. FIXTURES SHALL BE SUPPORTED INDEPENDENTLY OF CEILING SYSTEMS.
- B. LED LUMINAIRES SHALL BE UL 8750 LISTED AND TESTED IN ACCORDANCE WITH LM-79 AND LM-80 STANDARDS. THE LED LUMINAIRE SHALL HAVE A LUMINOUS EFFICACY OF AT LEAST 90 LUMENS/W, A COLOR TEMPERATURE OF 3500K OR 4000K, A CRI OF AT LEAST 80, AN ESTIMATED LIFE OF AT LEAST 50,000 HOURS AT L70 LUMEN MAINTENANCE AND SHALL INCLUDE A MINIMUM 5-YEAR WARRANTY ON THE ENTIRE LUMINAIRE INCLUDING THE DRIVER.

GENERAL SYSTEM NOTES

- A. LEGEND SHEET AND NOT ALL SYMBOLS MAY BE USED ON DRAWINGS.
- B. REFERENCE PLAN SHEETS TO DETERMINE REQUIRED SCOPE OF WORK.
- C. THE DRAWINGS ARE DIAGRAMMATIC, AND NOT ALL REQUIRED OFFSETS IN CONDUIT, CABLE TRAY, BOXES, AND PATHWAY TRANSITIONS ARE SHOWN. COORDINATE EXACT DIMENSIONAL LOCATIONS WITH EXISTING CONDITIONS AND OTHER TRADES PRIOR TO INSTALLATION.
- D. PROVIDE A MINIMUM OF ONE PULL BOX FOR EVERY 100 FEET OF STRAIGHT CONDUIT RUNS AND A PULL BOX FOR MORE THAN TWO (2) 90 DEGREE BENDS IN A CONDUIT RUN. DEBURR, CLEAN, CAP, AND TAG ALL CONDUITS AND FURNISH WITH A MINIMUM OF TWO (2) PULL STRINGS.
- E. INSTALL DEVICES IN AN ORDERLY MANNER AT THE SAME ELEVATION AS ADJACENT DEVICES, COORDINATED BETWEEN TRADES. WHERE INSTALLED DEVICES FEED OR ARE ASSOCIATED WITH FURNITURE, COORDINATE EXACT LOCATIONS WITH FINAL FURNITURE PLAN AND CASEWORK INSTALLER, PRIOR TO INSTALLATION.
- F. COORDINATE OSP / UNDERGROUND COMMUNICATION PATHWAYS WITH CIVIL ENGINEER PRIOR TO INSTALLATION. COORDINATE OSP / UNDERGROUND COMMUNICATION PATHWAYS INTO BUILDING WITH ELECTRICAL ENGINEER PRIOR TO INSTALLATION. WHERE POSSIBLE COLLATE COMMUNICATIONS OSP / UNDERGROUND PATHWAYS WITH ELECTRICAL OSP / UNDERGROUND PATHWAYS, I.O.N.
- G. COORDINATE ALL REQUIRED CABLING AND COMPONENTS WITH SYSTEM VENDOR AND/OR INSTALLER.
- H. ALL 120V POWER WIRING SHALL BE INSTALLED IN A SEPARATE CONDUIT.
- I. ALL CONDUIT ABOVE GRADE SHALL BE METALLIC, ALL CONDUIT BELOW GRADE SHALL BE PVC UNLESS OTHERWISE NOTED ON DRAWINGS.
- J. ALL CONDUIT, WIRING AND ASSOCIATED BACK BOXES SHALL BE FULLY CONCEALED WITHIN WALLS, FLOORS AND CEILINGS.
- K. THE MAXIMUM PULLING TENSION SHALL NOT EXCEED 25 POUNDS TO AVOID STRETCHING THE CONDUCTORS.
- L. COORDINATE LOCATION OF ALL FIRE RATED PENETRATIONS PRIOR TO PROCEEDING WITH INSTALLATION. ALL PENETRATIONS THROUGH FIRE RATED BARRIERS SHALL BE COMPLETELY SEALED WITH A LISTED FIRE STOP SYSTEM IN ACCORDANCE WITH NFPA AND THE AUTHORITY HAVING JURISDICTION.
- M. COORDINATE EXTERIOR AND WALL MOUNTED CAMERA LOCATIONS AND MOUNTING HEIGHTS PRIOR TO ROUGH-IN. COORDINATION MEETINGS SHALL BE SCHEDULED THROUGH THE ARCHITECTS AND/OR OWNER.

CLIENT DATA

Client:
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501 NE 1st Ave.
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PROJECT DATA

Project No: 24020
Project Name: OCALA SUNTRAN
RESTROOMS & KIOSK

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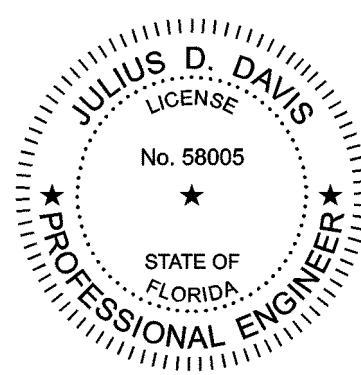
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ISSUE & REVISION DATA

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ENGINEER SEAL



05/28/2024

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E-001
SPECIFICATIONS - ELECTRICAL

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CLIENT DATA

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501 NE 1st Ave.
Ocala, FL 34470

PROJECT DATA

Project No: 24020
Project Na: OCALA SUNTRAN
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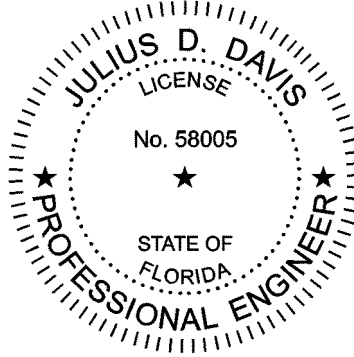
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ISSUE + REVISION DATA

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05.28.2024

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CHECKED BY: R.F.W.

E-002
SCHEDULES - ELECTRICAL

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GENERAL NOTES

- A. COORDINATE ALL ELECTRICAL REQUIREMENTS WITH THE DIVISION 22 CONTRACTOR, DIVISION 23 CONTRACTOR AND APPROVED EQUIPMENT SUBMITTALS PRIOR TO ROUGH-IN AND INSTALLATION. REFER TO MECHANICAL AND PLUMBING DRAWINGS FOR FURTHER INFORMATION.
- B. FOR ALL VFD-DRIVEN EQUIPMENT, PROVIDE A VFD-RATED CABLE ASSEMBLY BETWEEN THE VFD OUTPUT AND ASSOCIATED EQUIPMENT AS FOLLOWS; XLPE INSULATION RATED AT 2,000V, SHIELDED, 100% EQUIPMENT GROUND. CONDUIT AND CONDUCTORS BETWEEN SOURCE AND VFD INPUT SHALL BE AS SCHEDULED.

ELECTRICAL MECHANICAL EQUIPMENT SCHEDULE

TAG	HP	LOAD	FLA (AMPS)	VOLTAGE	PHASE	CONDUIT/WIRE (AWG)	PANEL	CIRCUIT NUMBER	STARTER			DISCONNECT			COMMENTS	
									NEMA SIZE	ENCLOS. TYPE	FURN. BY (DIV.)	SWITCH SIZE	NO. OF POLES	ENCLOS. TYPE		FURN. BY (DIV.)
AC-1	----	42 VA	0.2	208 V	1	3/4" CONDUIT WITH 3#12 AND 1#12 GROUND	MB	11.13	---	---	---	---	2	---	26	PROVIDE MOTORIZED DISCONNECT SWITCH
AC-2	----	42 VA	0.2	208 V	1	3/4" CONDUIT WITH 3#12 AND 1#12 GROUND	MB	11.13	---	---	---	---	2	---	26	PROVIDE MOTORIZED DISCONNECT SWITCH
AC-3	----	42 VA	0.2	208 V	1	3/4" CONDUIT WITH 3#12 AND 1#12 GROUND	MB	11.13	---	---	---	---	2	---	26	PROVIDE MOTORIZED DISCONNECT SWITCH
CU-1	----	3910 VA	18.8	208 V	1	1" CONDUIT WITH 3#8 AND 1#10 GROUND	MB	11.13	---	---	---	60A	2	NEMA 3R	26	PROVIDE NON-FUSED DISCONNECT SWITCH
EF-1	----	24 VA	.2	120 V	1	3/4" CONDUIT WITH 2#12 AND 1#12 GROUND	MB	7	---	---	---	---	---	---	23	PROVIDE MOTORIZED DISCONNECT SWITCH
EF-2	----	24 VA	.2	120 V	1	3/4" CONDUIT WITH 2#12 AND 1#12 GROUND	MB	21	---	---	---	---	---	---	23	PROVIDE MOTORIZED DISCONNECT SWITCH
ERV-1	----	30 VA	0.5	208 V	2	3/4" CONDUIT WITH 2#12 AND 1#12 GROUND	MB	35.37	---	---	---	30A	2	NEMA 1	26	PROVIDE NON-FUSED DISCONNECT SWITCH
EBW-1	----	3000 VA	14.4	208 V	2	3/4" CONDUIT WITH 3#12 AND 1#12 GROUND	MB	30.32	---	---	---	30A	2	NEMA 1	26	PROVIDE NON-FUSED DISCONNECT SWITCH

LUMINAIRE SCHEDULE

IMAGE	TYPE	DESCRIPTION	MANUFACTURER	MOUNTING	LUMENS	LAMP/WATTAGE	VOLTAGE
	A	2X2 LUMINAIRE (CCT SWITCH TO 3500K)	DAYBRITE: 2SBP3040L8CS 2 UNV DIM	RECESSED	4207	LED39W	MVOLT
	A1	2X2 LUMINAIRE WITH DRYWALL CEILING ADAPTOR (CCT SWITCH TO 3500K)	DAYBRITE: 2SBP3040L8CS 2 UNV DIM FMA22				
	B	4' STRIP FIXTURE (CCT SWITCH TO 4000K)	DAYBRITE: SDS 4 2448 8CST UNV DIM	SURFACE	4850	LED142W	MVOLT
	C	4' VANDAL WRAP	H.E. WILLIAMS: AVX 4 L181BLU CPC (MAX45W) DIM UNV	SURFACE		BLUE LED45W	MVOLT
	C1	4' VANDAL WRAP	H.E. WILLIAMS: AVX 4 L62 835 WPC DIM UNV	WALL @ 8' AFF	6200	LED57W	MVOLT
	X	EXIT SIGN	BEGHELLI: PX R SA	SURFACE		LED	MVOLT
	EM	EMERGENCY UNIT	BEGHELLI: BBX SE WH	WALL	600L/HEAD	LED	MVOLT
	WP	WALL PACK (LUMEN SWITCH TO 40% AND CCT SWITCH TO 4000K)	TRULY GREEN SOLUTIONS: WPFS S L C U D EM	WALL	3404	LED23W	MVOLT

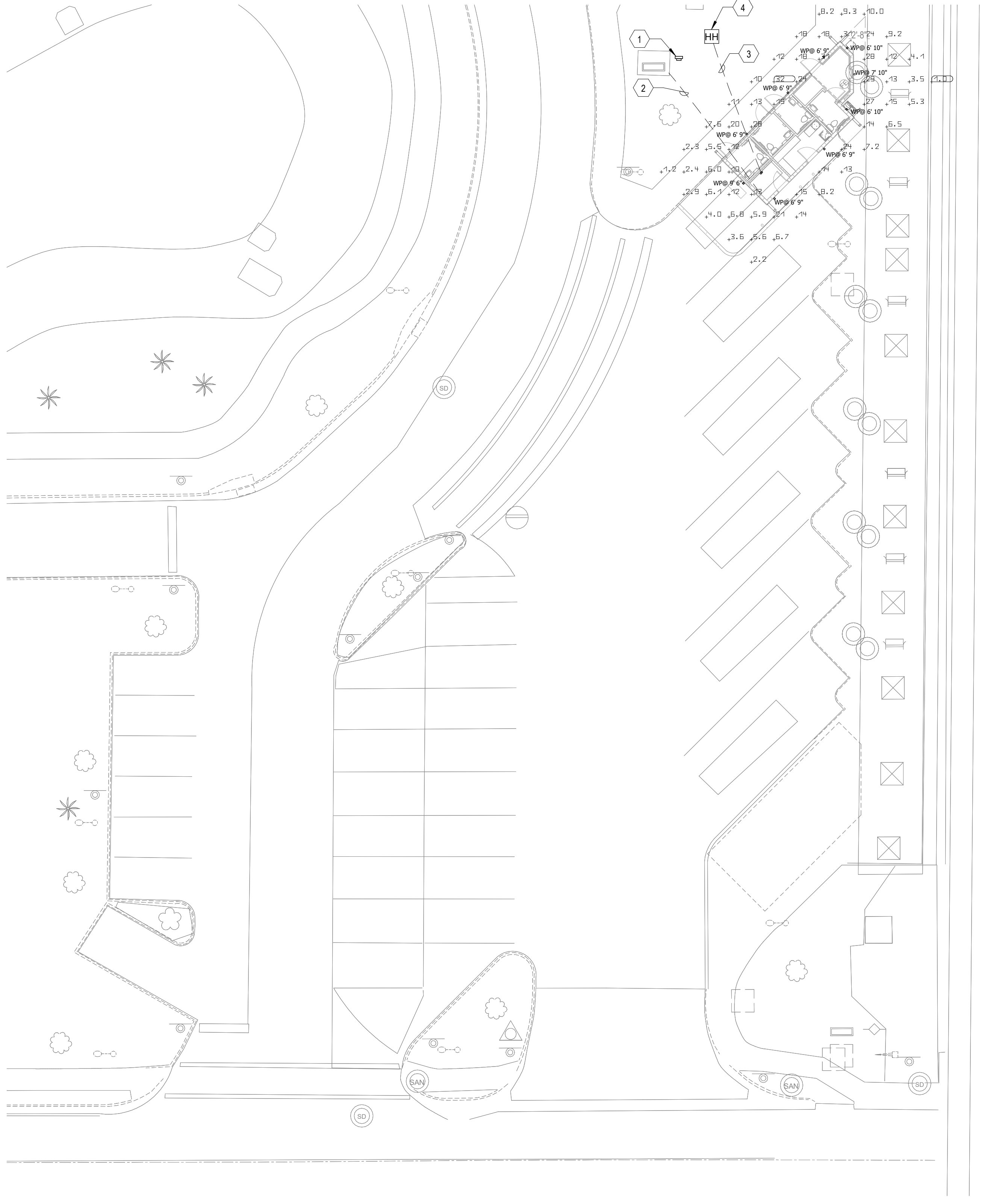
- NOTES:
1. ALL INTERIOR LUMINAIRE SHALL HAVE 4000 KELVIN COLOR TEMPERATURE AND EXTERIOR 3500 KELVIN COLOR TEMPERATURE, UNLESS OTHERWISE NOTED.
2. EXIT LIGHTS SHALL BE CONNECTED TO THE NEAREST UNSWITCHED CIRCUIT.
3. FINAL FIXTURE COLORS AND FINISHES SHALL BE SELECTED AND APPROVED BY OWNER/ARCHITECT.
4. COOPER, LITHONIA, AND COLUMBIA LIGHTING MAY SUBMIT APPROVED EQUIVALENTS.

GENERAL NOTES

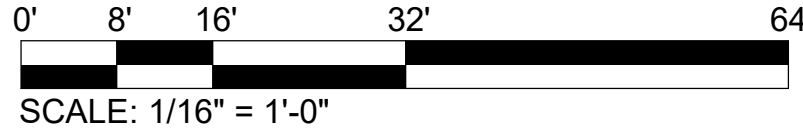
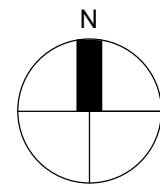
- A. COORDINATE COLORS AND FINISHED WITH ARCHITECT AND / OR OWNER PRIOR TO ORDERING.
- B. WHERE A LUMINAIRE IS AVAILABLE IN TRIM-BASED AND TRIMLESS CONFIGURATIONS, COORDINATE THE APPROPRIATE CONFIGURATION WITH THE ARCHITECT PRIOR TO ORDERING.
- C. COORDINATE CEILING TYPES WITH THE ARCHITECT PRIOR TO ORDERING. ONE (1) LUMINAIRE TYPE MAY BE LOCATED WITHIN MULTIPLE CEILING TYPES. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR FURTHER INFORMATION.
- D. PROVIDE INDEPENDENT SUPPORTS TO THE BUILDING STRUCTURE IN ACCORDANCE WITH THE APPLICABLE DIVISION 26 SPECIFICATION SECTIONS.
- E. WHERE A LUMINAIRE IS EQUIPPED WITH A DIMMABLE DRIVER, BUT IS NOT DEPICTED AS CONTROLLED VIA A DIMMER SWITCH ON THE LIGHTING PLANS, TERMINATE THE 0-10V CONTROL WIRING IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS TO ALLOW FOR ON / OFF SWITCHING.
- F. VERIFY COMPATIBILITY BETWEEN DIMMER SWITCHES AND DIMMABLE DRIVERS PRIOR TO ORDERING.
- G. COORDINATE LUMINAIRE LOCATIONS, MOUNTING HEIGHTS (WHERE APPLICABLE), SUSPENSION HEIGHTS (WHERE APPLICABLE) AND SUSPENSION METHODS (WHERE APPLICABLE) WITH ARCHITECT PRIOR TO ORDERING, ROUGH-IN AND INSTALLATION.
- H. START-UP: ELECTRICAL CONTRACTOR SHALL CONTACT LIGHTING CONTROL MANUFACTURER AT LEAST THIRTY (30) DAYS BEFORE TURNOVER OF PROJECT. LIGHTING CONTROL MANUFACTURER WILL BE ON SITE TO PROGRAM THE LIGHTING CONTROL SYSTEM WITH FEEDBACK FROM OWNER.

Luminaire list						
Index	Manufacturer	Article name	Luminous flux	Maintenance factor	Connected load	Quantity
WP	tgs	WPF-S 65W 4000K	10242 lm	0.40	62.4 W	9

Name	Parameter	Min	Max	Average	Mean/Min	Max/Min
Building Exterior	Perpendicular Illuminance	1.01 fc	32.2 fc	12.6 fc	12.39	31.83



1 SITE PLAN - ELECTRICAL
1/16" = 1'-0"



GENERAL NOTES

A. PROVIDE IN-GRADE HANDHOLES AS REQUIRED TO INSTALL POWER AND SIGNAL CABLES.

KEY NOTES

NUMBER	NOTES
1	PROPOSED UTILITY TRANSFORMER AND METER LOCATION.
2	PROPOSED ROUTING OF UTILITY TRANSFORMER SECONDARY FEEDER. REFER TO SHEET E-501 FOR FEEDER INFORMATION.
3	PROVIDE (2) 2" CONDUIT WITH INNER DUCT AND DUCT SEAL ON CONDUIT ENDS FOR TELECOMMUNICATION SERVICE. COORDINATE TELECOMMUNICATION SERVICE REQUIREMENT AND INSTALLATION WITH TELECOMMUNICATION PROVIDED.
4	PROPOSE LOCATION FOR TELECOMMUNICATION SERVICE CONNECT. PROVIDE 12" X 12" X 12" TRAFFIC RATED PULL BOX WITH LED LABEL "COMMUNICATIONS".



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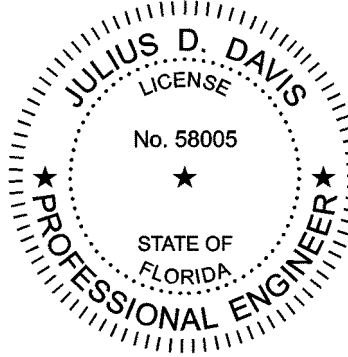
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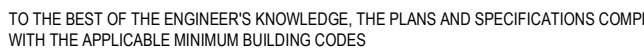
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E-100
SITE PLAN - ELECTRICAL

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NUMBER	NOTES
1	PROVIDE READYSPEC FIRE RATED BACKBOARD UTILIZING 48" X 48" PANELS STACKED TWO HIGH (TOTAL OF 8' IN HEIGHT) BEGINNING 6" AFF.
2	PROVIDE DATA OUTLET WITH OUTDOOR RATED COVER.

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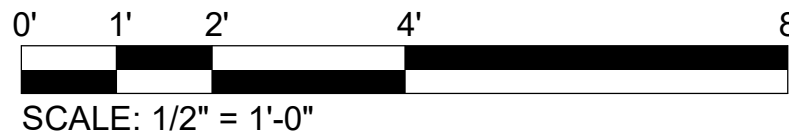


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RESTROOMS & KIOSK

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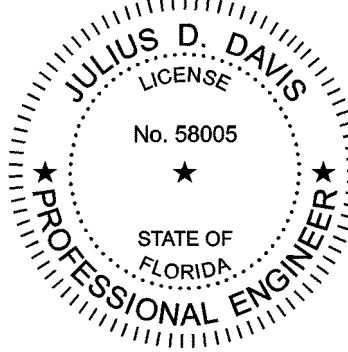
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E-301
FIRST FLOOR PLAN - LIGHTING

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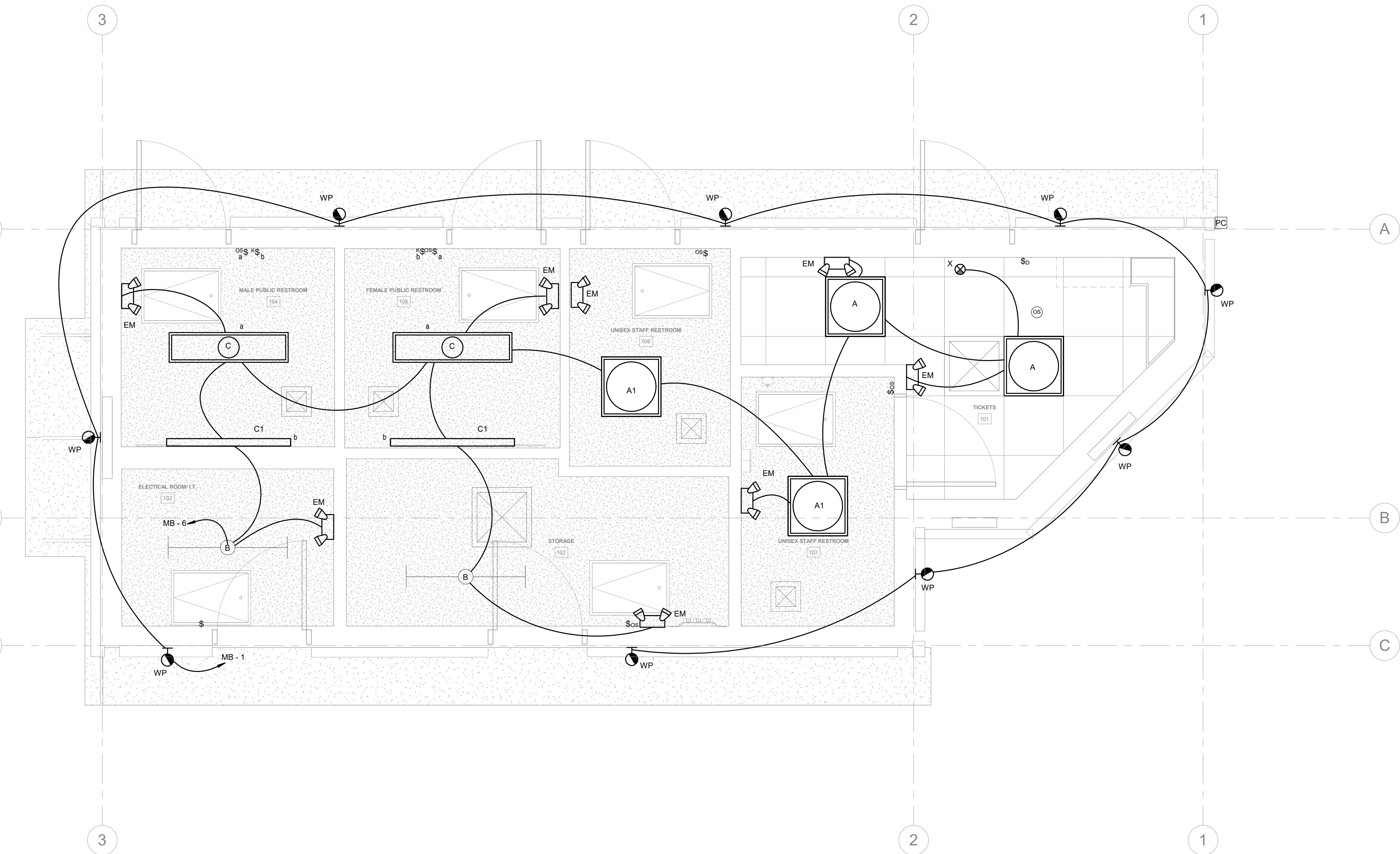
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GENERAL NOTES

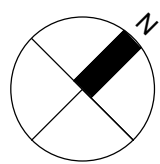
- A. REFER TO ARCHITECTURAL CEILING PLANS FOR LOCATIONS OF ALL CEILING - MOUNTED LUMINAIRES. COORDINATE LOCATIONS WITH ARCHITECT AND OTHER TRADES PRIOR TO ROUGH-IN. ADJUST AS REQUIRED.
- B. REFER TO ARCHITECTURAL CEILING PLANS FOR FINISHED CEILING TYPES. PROVIDE SUITABLE ACCESSORIES AND / OR MOUNTING HARDWARE (AS REQUIRED). WHERE FIRE RATED CEILING SYSTEMS ARE INDICATED, PROVIDE LISTED, PREFABRICATED, FIRE RATED ENCLOSURES (AS REQUIRED).
- C. REFER TO ARCHITECTURAL ELEVATIONS FOR LOCATIONS AND MOUNTING HEIGHTS OF ALL WALL MOUNTED LUMINAIRES. COORDINATE LOCATIONS AND MOUNTING HEIGHTS WITH ARCHITECT, STRUCTURAL ENGINEER AND OTHER TRADES PRIOR TO ROUGH-IN, ADJUST (AS REQUIRED).
- D. SEQUENCE OF OPERATIONS:
-LUMINAIRE WITHIN RESTROOMS CONTROLLED BY OCCUPANCY SENSOR SHALL SWITCH OFF AFTER NOT DETECTING INDIVIDUAL(S) FOR 20 MINUTES. FULL OUTPUT WHEN INDIVIDUAL(S) ARE DETECTED.
-LUMINAIRES WITHIN TICKETS SHALL SWITCH OFF AFTER NOT DETECTING INDIVIDUAL(S) FOR 20 MINUTES. MANUAL ON.

KEY NOTES

NUMBER NOTES



1 FIRST FLOOR PLAN - LIGHTING
1/2" = 1'-0"

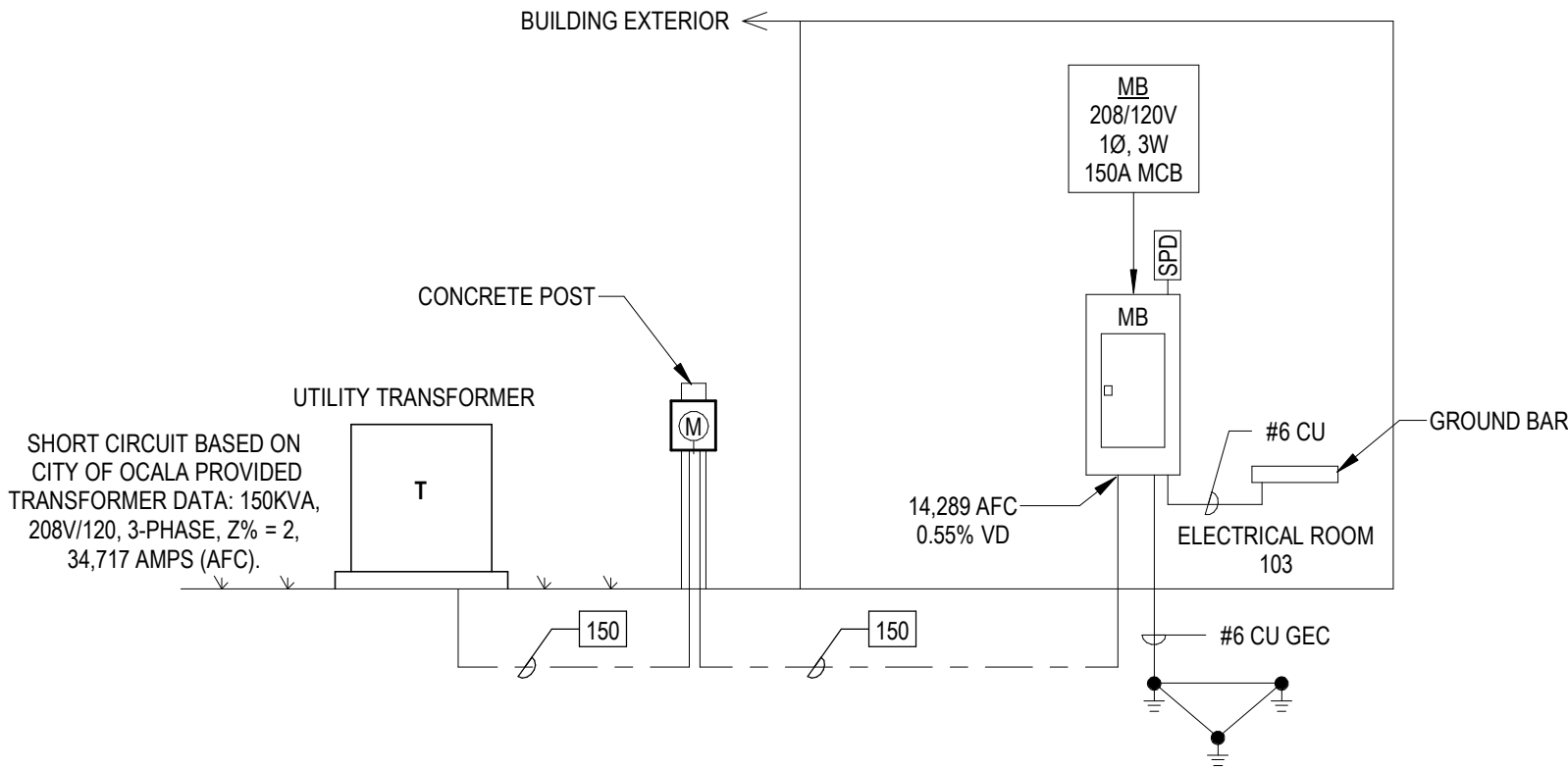


0' 1' 2' 4' 8'
SCALE: 1/2" = 1'-0"

Branch Panel: MB													
Location: ELECTRICAL ROOM/ I.T....					Volts: 120/208 Single				A.I.C. Rating: 25KA				
Supply From:					Phases: 1				Mains Type: MCB				
Mounting: SURFACE					Wires: 3				Mains Rating: 150 A				
Enclosure:										MCB Rating: 150 A			
Notes:													
Notes	CKT	Circuit Description	Trip	Poles	A		B		Poles	Trip	Circuit Description	CKT	Notes
	1	BLDG EXTERIOR LIGHTING	20 A	1	585 VA	360 VA			1	20 A	RECEPT. RM 101	2	
	3	RECEPT. RM103	20 A	1			360 VA	360 VA	1	20 A	RECEPT. RM103	4	
	5	CP-1	15 A	1	180 VA	506 VA			1	20 A	ROOMS 101 TO 107 LIGHTS	6	
	7	EF-1	15 A	1			24 VA	180 VA	1	20 A	EXTERIOR SIGNAGE	8	
	9	RECEPT. BLDG EXTERIOR	20 A	1	540 VA	540 VA			1	20 A	RECEPT. RM 101	10	
	11	CU-1	40 A	2	2018 VA	540 VA	2018 VA	0 VA	1	20 A	SPARE	12	
	13						720 VA	180 VA	1	20 A	RECEPT. RM 101	14	
	15	RECEPT. RM 104 TO 107	20 A	1					2	15 A	HRU PANEL	16	
	17	SPRINKLER BELL	15 A	1	180 VA	0 VA						18	
	19	HAND DYER RM 107	20 A	1			1000 VA	1000 VA	1	20 A	HAND DYER RM 104	20	
	21	EF-2	15 A	1	24 VA	180 VA			1	15 A	HVAC CONTROLS	22	
	23	RECEPT. RM 102,103	20 A	1			540 VA	1000 VA	1	20 A	TICKET DISPENSER	24	
	25	SPARE	20 A	1	0 VA	0 VA			1	20 A	SPARE	26	
	27	RECEPT. RM 101	20 A	1			540 VA	1000 VA	1	20 A	RECEPT. EWC	28	
	29	HAND DYER RM 106	20 A	1	1000 VA	1500 VA			2	20 A	EWI-1	30	
	31	SPARE	20 A	1			0 VA	1500 VA				32	
	33	HAND DYER RM 105	20 A	1	1000 VA	0 VA			1	20 A	SPARE	34	
	35	ERV-1	15 A	2	15 VA	0 VA	15 VA	0 VA	1	20 A	SPARE	36	
	37								1	20 A	SPARE	38	
	39	SPACE	--	1	--	--	--	0 VA	1	20 A	SPARE	40	
	41	SPACE	--	1	--	--			1	--	SPACE	42	
	43	SPACE	--	1	--	--	--	--	1	--	SPACE	44	
	45	SPACE	--	1	--	--			1	--	SPACE	46	
	47	SPACE	--	1	--	--	--	--	1	--	SPACE	48	
	49	SPACE	--	1	--	--			1	--	SPACE	50	
	51	SPD	30 A	2	0 VA	--	0 VA	--	1	--	SPACE	52	
	53								1	--	SPACE	54	
					Total Load:	9161 VA	10437 VA						
					Total Amps:	88 A	99 A						
Legend:													
Load Classification			Connected Load	Demand Factor	Estimated Demand		Panel Totals						
Lighting			1087 VA	125.00%	1358 VA								
HVAC/MOTOR			4036 VA	100.00%	4036 VA		Total Conn. Load: 19598 VA						
RECEPT.			5500 VA	100.00%	5500 VA		Total Est. Demand: 19869 VA						
MISC.			8978 VA	100.00%	8978 VA		Total Conn.: 94 A						
							Total Est. Demand: 96 A						
Notes:													

BUILDING DEMAND LOAD SUMMARY					
		System Information			
		Voltage	Phase		
		120	208	1	
LIGHTING "L":	1.09 KVA @ 1.25 DF=	1.363			
RECEPT "R":	5.50 KVA, 1ST 10KVA + 50% OF REMAINDER=				5.500 KVA
A/C "A":	4.04 KVA @ 1.00 DF=	4.040			
KITCHEN "K":	0.00 KVA @ .65 DF=	0.000			
MOTOR "M":	0.00 KVA, TOTAL @100%=				0.000 KVA
	0.00 KVA LARGEST MOTOR AT 125% =				0.000 KVA
HEATING "H":	0.00 KVA @ 1.00 DF=	0.000			
MISC "S":	8.98 KVA @ 1.00 DF=	8.980			
Total Connected Load		19.61	KVA		
Total Connected Load @ 480V, 3PH		94.28	AMPS		
		Total Demand Load		19.883	KVA
		Total Demand Load @ 208V, 1PH		95.59	AMPS
ELECTRICAL SERVICE ==> 150 AMPS					

COPPER CONDUCTOR FEEDER SCHEDULE (90/75 RATED)						
SYMBOL	NUMBER OF SETS	PHASE CONDUCTORS (QUANTITY) SIZE - AWG	NEUTRAL CONDUCTORS (QUANTITY) SIZE - AWG	GROUNDING CONDUCTORS (QUANTITY) SIZE - AWG	CONDUIT SIZE (QUANTITY) SIZE	REMARKS
150	1	(3) #10	(1) #10	--	(1) 2"	



GENERAL NOTES

- CONDUIT RUNS ON THIS RISER ARE SHOWN DIAGRAMMATICALLY AND DO NOT REFLECT ACTUAL FIELD CONDITIONS. PRIOR TO COMMENCEMENT OF WORK, THE CONTRACTOR SHALL FIELD VERIFY ALL ROUTING WITH EXISTING CONDITIONS AND ALL OTHER TRADES.
- COORDINATE SERVICE ENTRANCE CONNECTIONS WITH THE UTILITY CUSTOMER SERVICE PROJECT MANAGER PRIOR TO COMMENCEMENT OF WORK AND PROVIDE ACCORDINGLY FOR A COMPLETE ELECTRICAL INSTALLATION.
- THE CONTRACTOR SHALL MAINTAIN THE FIRE RATING OF ALL WALL AND FLOOR PENETRATIONS THROUGH WHICH CONDUITS PASS.
- ALL ELECTRICAL EQUIPMENT SHALL BE PROPERLY LABELED TO INDICATE POTENTIAL ELECTRICAL ARC FLASH HAZARDS IN ACCORDANCE WITH N.E.C. ARTICLE 110.16.
- INCREASE FEEDER CONDUCTOR AND CONDUIT SIZES (AS REQUIRED) IN ORDER TO MAINTAIN A MAXIMUM CUMULATIVE VOLTAGE DROP OF FIVE (5) PERCENT AT THE FURTHEST DOWNSTREAM EQUIPMENT. VOLTAGE DROP SHALL BE DISTRIBUTED AMONGST FEEDERS AND BRANCH CIRCUITS IN ACCORDANCE WITH GENERAL NOTES AND FLORIDA ENERGY CODE REQUIREMENTS. WHERE EQUIPMENT IS UNABLE TO ACCOMMODATE UPSIZED CONDUCTORS, PROVIDE LUG KITS (AS REQUIRED), WHERE LUG KITS ARE UNABLE TO ACCOMMODATE UPSIZED CONDUCTORS, SPLICE AND TRANSITION TO A SMALLER CONDUCTOR SIZE AT THE POINT OF TERMINATION VIA AN AUXILIARY GUTTER, PULL BOX, WIREWAY, OR OTHER SUITABLE DEVICE.
- CONTRACTOR TO COORDINATE WITH CITY OF OCALA ELECTRIC UTILITY FOR NEW ELECTRICAL SERVICE. PROVIDE REQUIRED SERVICE APPLICATION, LOAD DATA SHEET (LDS), GREEN STICKER ON METER CAN, ETC.. ADD NOTE TO LDS "A SECOND SET OF (4) HOLE SPADE LUGS (QUANTITY 4) BACK-TO-BACK WILL BE REQUIRED AND TRANSFORMER WILL NEED TO BE DE-ENERGIZED."

KEY NOTES

NUMBER	NOTES
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CLIENT DATA

Client:
CITY OF OCALA
501 NE 1st Ave.
Ocala, FL 34470

PROJECT DATA

Project No: 24020
Project Na: OCALA SUNTRAN
RESTROOMS & KIOSK

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COA: #27158
Proj: #01.22029

EOR: JULIUS D. DAVIS, P.E. #58005

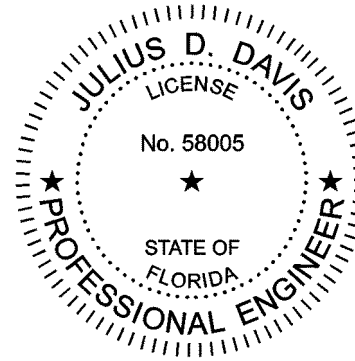
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E-501
RISER DIAGRAM - ELECTRICAL

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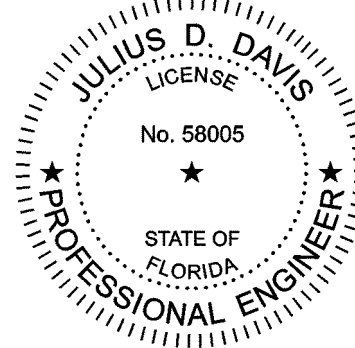
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E-901
DETAILS - ELECTRICAL

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<div>GENERAL NOTES</div> <div>1. DUPLEX RECEPTACLE SHOWN, SIMILAR FOR ALL WIRING DEVICES.</div>	NTS	5	<div>GENERAL NOTES</div> <div>1. VERIFY ALL MECHANICAL EQUIPMENT NAME PLATE RATINGS PRIOR TO ROUGH-IN AND ORDERING ELECTRICAL EQUIPMENT INTENDED TO SERVE THE HVAC SYSTEM. 2. ALL MECHANICAL EQUIPMENT POWER CONNECTIONS SHOWN ON THESE DRAWINGS ARE BASED ON INFORMATION SHOWN ON MECHANICAL DRAWINGS DURING THE DESIGN PROCESS. THE MECHANICAL / GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR ANY CHANGES IN THE ELECTRICAL EQUIPMENT DUE TO ACCEPTANCE OF APPROVED EQUAL OR SUBSTITUTIONS OF ANY MECHANICAL EQUIPMENT. 3. STARTERS PROVIDED BY THE MECHANICAL CONTRACTOR SHALL BE INSTALLED AND CONNECTED TO THE LINE VOLTAGE BY THE ELECTRICAL CONTRACTOR. ALL FACTORY INSTALLED STARTERS SHALL BE WIRED BY THE ELECTRICAL CONTRACTOR (SEE NOTE 2). 4. ELECTRICAL CONTRACTOR SHALL PROVIDE 3/4" EMPTY CONDUIT THROUGH ANY INACCESSIBLE LOCATIONS (I.E.: UNDER SLAB, CONCRETE DECK) FOR CONTROL WIRING. COORDINATE ALL LOCATIONS WITH MECHANICAL PRIOR TO ROUGH-IN. 5. ALL DISCONNECT SWITCHES SHALL BE EASILY ACCESSIBLE, DO NOT INSTALL ANY DISCONNECT SWITCH ABOVE AN ACCESS PANEL. COORDINATE EXACT LOCATION WITH EQUIPMENT SUPPLIER. 6. PROVIDE PHENOLIC LABEL FOR EACH DISCONNECT SWITCH, IDENTIFYING THE EQUIPMENT, THE PANEL AND CIRCUIT NUMBER SERVING THE EQUIPMENT.</div>	NTS	3	<div>TYPICAL 120/208V PANELBOARD</div> <div>TYPICAL 120/208V PANELBOARD</div>	NTS	1
<div>OUTLET BOXES</div>	NTS	6	<div>GENERAL NOTES</div> <div>1. ALL WIRING SHALL BE PER TVSS MANUFACTURER'S REQUIREMENTS. 2. WIRE LENGTH SHOULD BE AS SHORT AND STRAIGHT AS POSSIBLE WITH TVSS DEVICE LOCATED ADJACENT TO ITS BREAKER. NEUTRAL BUS SIDE. 3. PROVIDE CONNECTION TO ISOLATED GROUND BAR IF AVAILABLE.</div>	NTS	4	<div>COMMUNICATIONS GROUND BAR</div>	NTS	2



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ENGINEER DATA

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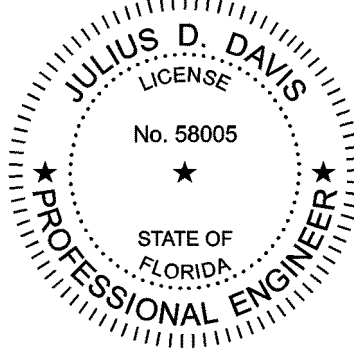
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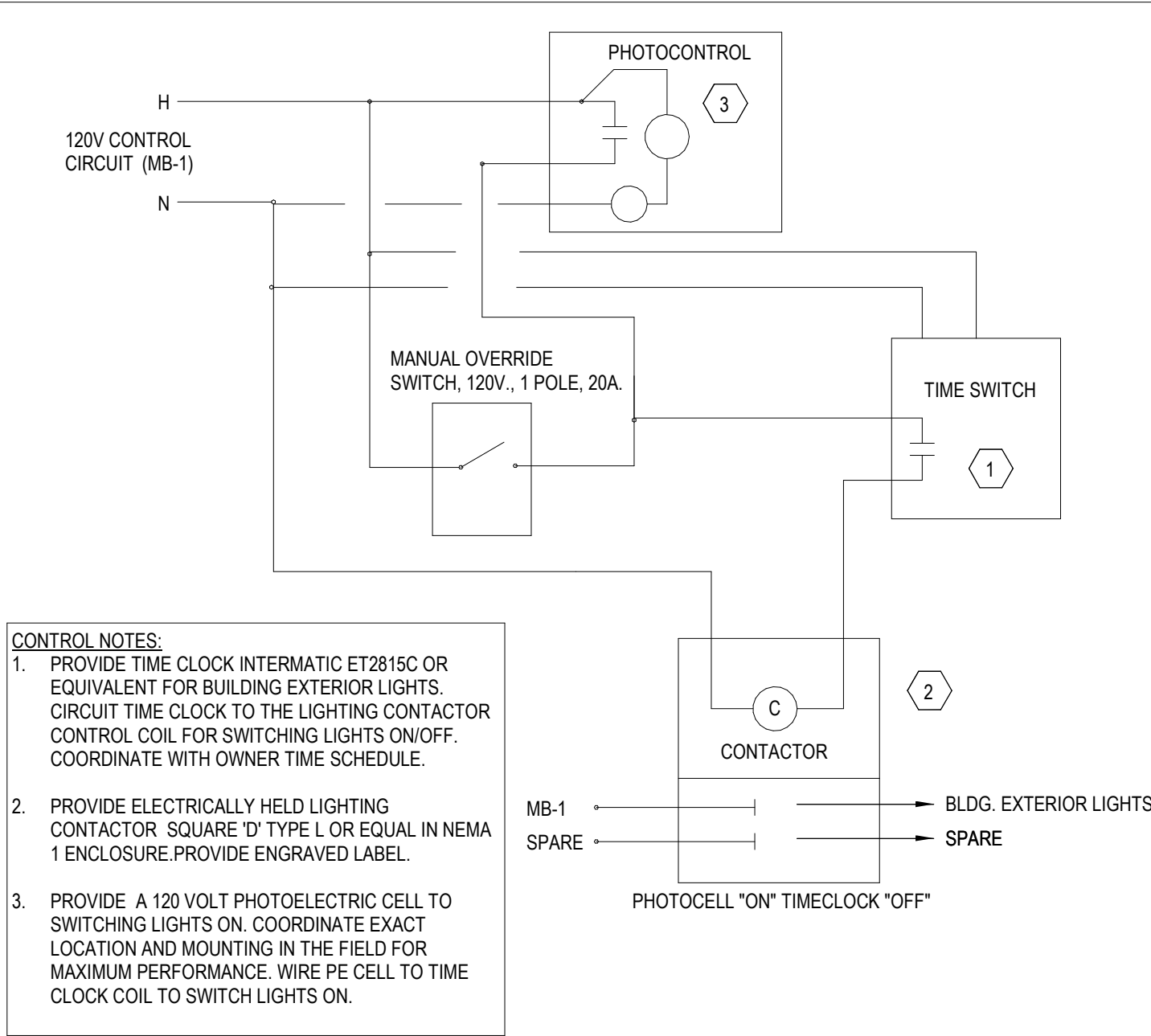
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DETAILS - ELECTRICAL

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BUILDING EXTERIOR LIGHTING CONTROLS

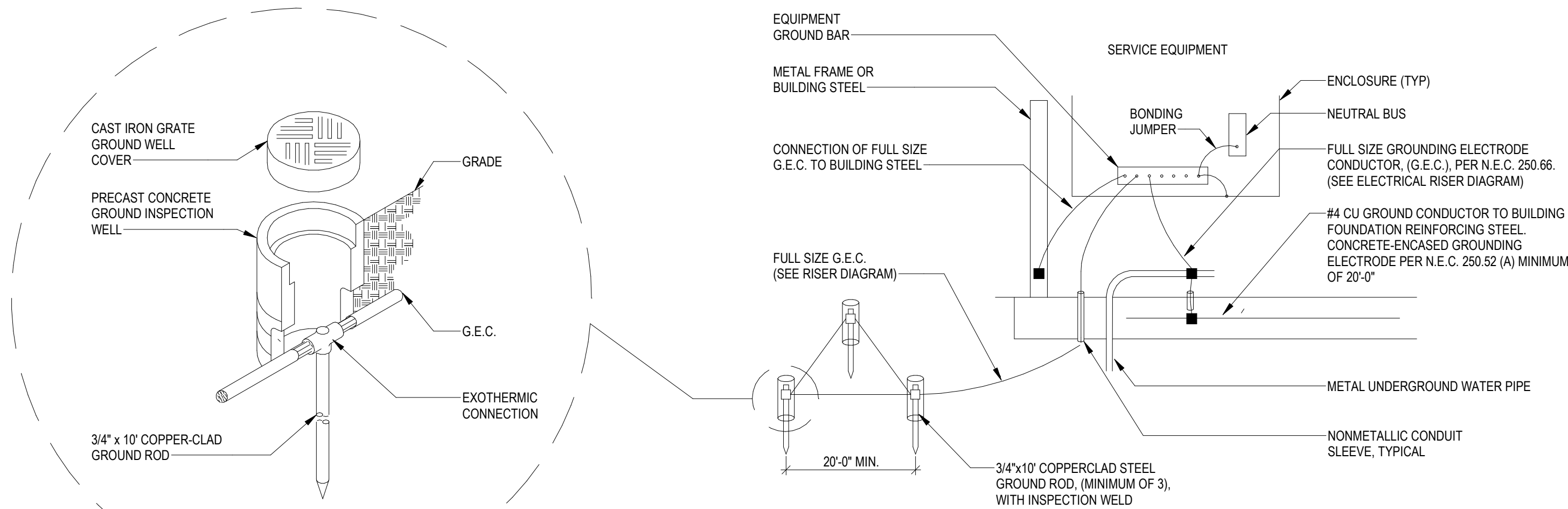
NTS

3

DEVICE MOUNTING HEIGHTS

NTS

1



GENERAL NOTES

- OBTAIN TWENTY-FIVE (25) OHMS MAXIMUM RESISTANCE READ WITH AN OHM METER, USING TWO (2) REFERENCE RODS. IF TWENTY-FIVE (25) OHMS CANNOT BE ACHIEVED, CONTRACTOR SHALL PROVIDE ADDITIONAL GROUND RODS UNTIL TWENTY-FIVE (25) OHMS HAS BEEN OBTAINED.

GROUNDING ELECTRODE SYSTEM

NTS

2

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A. TYPICAL INSTALLATION WITH CONDUIT STUBBED ABOVE CEILING FOR INSULATED, EXTERIOR, OR FIRE-RATED WALLS UNLESS OTHERWISE SHOWN ON PLANS.

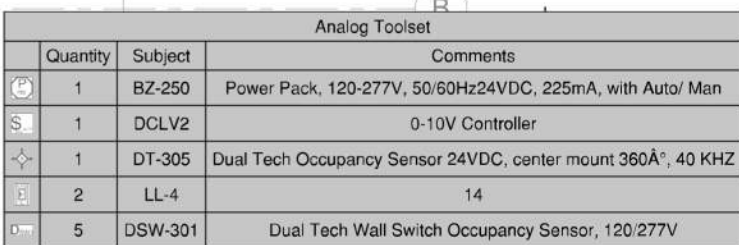
KEY NOTES

1. PROVIDE FIRE-RATED PUTTY AT RATED WALLS.

TYPICAL WALL OUTLET

NTS

1



GENERAL NOTES:

- A. LIGHT CONTROL INFORMATION SHOWN ON THIS PAGE IS FOR REFERENCE.
- B. COORDINATE WITH LIGHTING CONTROLS VENDOR WIRING, ALL COMPONENTS AND QUANTITIES.
- C. REFER TO FLOOR PLANS FOR INFORMATION.
- D. LIGHTING CONTROLS SHALL SATISFY FLORIDA BUILDING CODES REQUIREMENTS.

LIGHTING CONTROLS LAYOUT

NTS

2