

GENERAL SPECIFICATIONS.

DIVISION 16 - ELECTRICAL
PART 1 GENERAL
CONDITIONS OF THE CONTRACT AND DIVISION 1 APPLY TO THIS SECTION.
SPECIFICATIONS FOR DIVISION 16 - ELECTRICAL ARE HEREBY INCLUDED IN THIS DIVISION.

1.01 DESCRIPTION

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

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

1.02 WORK INCLUDED
A. PROVIDE COMPLETE INSTALLATION OF ELECTRIC BRANCH CIRCUIT WIRING, WIRING DEVICES, LIGHTING FIXTURES, LAMPS, AND OTHER WORK INDICATED ON THE DRAWINGS.
B. PROVIDE POWER SUPPLY WIRING TO ALL MOTORS INCLUDING DISCONNECT SWITCHES AND MANUAL STARTERS WHERE REQUIRED.
C. CONTROL WIRING FOR MECHANICAL EQUIPMENT AS INDICATED IN RESPECTIVE DIVISIONS OF THE SPECIFICATIONS AND AS SHOWN ON DRAWINGS.
D. EMPTY RACEWAY SYSTEMS AS MAY BE REQUIRED BY OTHERS AND AS NOTED OR SHOWN ON OTHER DRAWINGS.

PART 2 WORK BY OTHERS
2.01 GENERAL CONTRACTOR
A. PAINTING OF ELECTRICAL WORK AND EQUIPMENT INSTALLED BY THE ELECTRICAL CONTRACTOR, SUCH AS EXPOSED CONDUIT, J-BOXES, ETC. IN PUBLIC AREAS SHALL BE BY THE GENERAL CONTRACTOR.
B. OPENINGS, RECESSES, FURNISHING, ETC., AS REQUIRED FOR ELECTRICAL EQUIPMENT SHALL BE BY THE GENERAL CONTRACTOR.
2.02 OTHER
A. SPECIFIC ITEMS ON DRAWINGS IDENTIFIED AS NIC (NOT IN CONTRACT) ARE FURNISHED AND INSTALLED BY OTHERS, ITEMS IDENTIFIED AS FURNISHED BY OTHERS SHALL BE INSTALLED BY THE CONTRACTOR.
PART 3 BASIC MATERIALS AND METHODS
3.01 ALL WIRING SHALL BE IN ELECTRICAL METALLIC TUBING (EMT) UNLESS SHOWN OTHERWISE ON DRAWINGS.

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

3.02 CONDUCTORS
A. UNLESS SPECIFICALLY INDICATED ON DRAWINGS OR HEREIN, CONDUCTORS, SHALL BE SINGLE CONDUCTOR, COPPER, INSULATED FOR 600 VOLTS, MANUFACTURER'S STANDARD PRODUCT, AND MARKED AS REQUIRED BY NEC.
1. SERVICE CONDUCTOR TO BE THW, XHHW, OR THWN.
2. BRANCH CIRCUITS AND FEEDERS NO. 8 AND SMALLER TO BE TYPE THHN, THWN, XHHW.
3. NO. 8 OR LARGER SHALL BE STRANDED. NO. 10 AND SMALLER SHALL BE SOLID.
4. MINIMUM BRANCH CIRCUIT CONDUCTOR SIZE TO BE NO. 12 LINE VOLTAGE CONTROL WIRING MAY BE NO. 14 WHERE PROPERLY PROTECTED BY OVERCURRENT DEVICE.
5. LOW VOLTAGE CONTROL (THERMOSTAT, ETC.) CIRCUITS SHALL UTILIZE 18 GAUGE, 600 VOLT, MULTI-CONDUCTOR COPPER CABLE, UNLESS NOTED OTHERWISE.
6. MAKE SPICES AND TERMINATIONS ONLY IN ACCESSIBLE BOXES, WIREWAYS, CABINETS, OR FIXTURES.

3.03 ELECTRICAL SUPPORTING DEVICES
A. SINGLE CONDUIT RUNS SHALL BE SUPPORTED BY ONE HOLE ZINC-COATED CONDUIT STRAP SIMILAR TO APPLITION SL SERIES OR CONDUIT HANGERS SIMILAR TO APPLITION HXXXWB OR HXXX-SWB SERIES.
B. MULTIPLE HORIZONTAL CONDUIT RUNS SHALL BE SUPPORTED ON TRAPEZE TYPE HANGERS CONSISTING OF STRUCTURAL SUPPORT EQUI TO UNISTRUT 1-5/8" X 1-5/8" X 1-5/8" P1000 SERIES WITH TWO 3/8" ZINC-COATED RODS. SECURE CONDUITS TO SUPPORT WITH UNISTRUT CLAMPS.
3.04 GROUNDING SYSTEM
A. ALL ITEMS REQUIRED TO BE GROUNDED BY ARTICLE 250 OF THE NEC SHALL BE GROUNDED PER ARTICLE 250 OR AS SHOWN ON THE DRAWINGS. ALL RACEWAYS SHALL INCLUDE GREEN INSULATED GROUNDING CONDUCTOR. BONDING SHALL BE PROVIDED WHEN REQUIRED TO ASSURE ELECTRICAL CONTINUITY.
3.05 ELECTRICAL DISTRIBUTION SYSTEM
A. BRANCH CIRCUITS: WHERE BRANCH CIRCUITS ARE EXPOSED, THEY SHALL BE RUN PARALLEL WITH THE BUILDING WALLS, CEILINGS, AND FLOORS.
B. CONCEALED CONDUIT SHALL BE RUN BY THE SHORTEST BOX TO BOX ROUTE, AVOIDING CONFLICTS WITH OTHER TRADES.
C. ALL PANELBOARDS AFFECTED SHALL HAVE A TYPED CIRCUIT DIRECTORY POSTED ON THE INSIDE OF THE PANEL DOOR.
NEW BRANCH CIRCUIT BREAKERS SHALL BE PROVIDED IN EXISTING PANELBOARDS AS REQUIRED. NEW BREAKERS SHALL BE BY THE SAME MANUFACTURER.

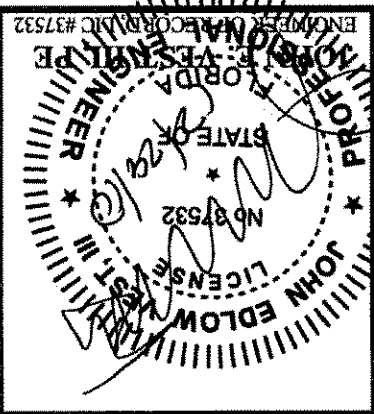
3.06 WIRING DEVICES
A. WIRING DEVICES SHALL BE EQUAL IN QUALITY, FUNCTION, AND GENERAL APPEARANCE TO THE FOLLOWING:
1. FLUSH WALL SWITCHES: 20A, 120/277V, SPECIFICATION GRADE, COORDINATE COLOR: EQUAL TO 1221-1 HUBBELL FOR SINGLE POLE. FURNISH 2-POLE, 3-WAY, ETC., AS REQUIRED, SAME SERIES.
2. WALL RECEPTACLES: 20A, 125V, 2P, 3W, GROUNDING, WHITE, NEMA 5-20R INDICATED ON DRAWINGS.
3. DIMMER SWITCHES SHALL BE VERTICAL SLIDE CONTROL TYPE WITH FACEPLATE, PRESET, ON-OFF SWITCH, AND 1000VA OTHERWISE SHOWN ON THE PLAN.
4. WALL PLATES SHALL BE SMOOTH FACE NYLON, WHITE, OR MATCHING WALL FINISH, EXCEPT FOR STOCK ROOM, VERIFY COLOR WITH OWNER.
3.07 LIGHTING FIXTURES
A. CONTRACTOR SHALL FURNISH ALL LIGHTING FIXTURES COMPLETE WITH LAMPS AND MOUNTING ACCESSORIES AS SHOWN ON FIXTURE SCHEDULE. INSTALL EACH FIXTURE AND PLACE IT IN OPERATION UNLESS SHOWN OTHERWISE ON DRAWINGS OR STATED HEREIN. FRAMES AND TRIM SHALL BE APPROPRIATE FOR CEILING FINISH.

3.08 SAFETY AND DISCONNECT SWITCHES
A. SAFETY AND DISCONNECT SWITCHES SHALL BE HEAVY DUTY TYPE, QUICK-MAKE, QUICK-BREAK FUSED WITH RATINGS AND SIZES AS NOTED ON PLANS AND REQUIRED BY CODES. LUG CONNECTIONS SHALL TO BE 75°C RATED.
B. SWITCHES SHALL BE WEATHERPROOF IN OUTDOOR LOCATIONS OR AS REQUIRED BY LOCAL CODES. DISCONNECT SWITCHES THAT ARE INSTALLED AT HAVAC EQUIPMENT SHALL BE FUSED IF NOT PROTECTED WITH A HACR BREAKER IN ACCORDANCE WITH THE EQUIPMENT NAMEPLATE AND MANUFACTURER'S REQUIREMENT PER THE LATEST EDITION OF THE NEC, STATE AND LOCAL CODES.
C. MANUAL MOTOR STARTERS WITHOUT OVERLOAD PROTECTION HEATERS SHALL BE USED AS A DISCONNECTING MEANS ONLY WHERE INDICATED ON DRAWINGS FOR MOTORS ABOVE 1-1/2 HP AT 120 VOLTS AND 2HP AT 208 VOLTS THAT DO NOT REQUIRE AUXILIARY CONTROL. MOTORS THAT ARE BELOW 1-1/2 HP AT 120 VOLTS AND 2HP AT 240 VOLTS ARE TO BE PROVIDED WITH HUBBELL "HBL1221" OR "HBL1222" AC SNAP SWITCH.
D. MANUFACTURE SHALL BE SQUARE "D" OR APPROVED EQUAL.
E. FUSES SHALL BE BUSSMANN CURRENT LIMITING, TIME DELAY, TYPE LPS-RK OR TYPE KRP-C AS REQUIRED.
3.09 PANELBOARDS
A. ALL PANELBOARDS SHALL BE FACTORY ASSEMBLED WITH BOLTED CIRCUIT BREAKERS, SOLID COPPER BUSING, FULLY SIZED COPPER NEUTRAL, 100% GROUND BUSS, AND OVERALL HINGED AND LOCKABLE DOOR. ALL CIRCUIT BREAKERS SHALL BE QUICK-MAKE AND QUICK-BREAK DESIGN, THERMAL-MAGNETIC, TRIP FREE, AND TRIP-INDICATING. ALL PANELS SHALL BE DEAD FRONT AND FLUSH OR SURFACE MOUNTED AS SHOWN ON THE PLANS. ALL LIGHTING BRANCH CIRCUIT BREAKERS SHALL BE SWITCHING DUTY RATED AND LABELED "SWD".

B. ALL PANELBOARDS PHASE AMPERAGE SHALL BE BALANCED TO WITHIN 10 PERCENT MAX. TO MIN. REBALANCE NON-LIGHTING BRANCH CIRCUITS AS REQUIRED AND NOTE CHANGES ON RECORD DRAWINGS.
C. ALL LUG CONNECTIONS TO BE 75°C RATED.
D. MANUFACTURE: SQUARE "D," OR ENGINEER APPROVED EQUAL.

3.10 TELEPHONE AND DATA WIRING
A. FURNISH AND INSTALL A SYSTEM OF CONDUIT RACEWAYS, OUTLET BOXES, PULL WRES, AND TERMINAL BOARDS AS SHOWN ON THE PLANS. TELEPHONE SWITCHING APPARATUS, MISCELLANEOUS EQUIPMENT, AND APPURTENANCES ARE NOT PART OF THIS CONTRACT AND WILL BE PROVIDED BY THE OWNER.
B. OUTLET BOXES TO BE 4" SQUARE (MIN) WITH SINGLE DEVICE COVER AND TELEPHONE PLATE
3.11 FIRE ALARM
A. MANUAL PULL STATION SHALL BE FIREPULTE MODEL BG12LX, BG12 (IF REQUIRED)
B. FIRE ALARM INDICATING DEVICES SHALL BE HORN/STROBE, WHEELLOCK AS SERIES, MT SERIES, AND RSS SERIES (IF REQUIRED).
C. DUCT SMOKE DETECTOR SHALL BE SYSTEM SENSOR MODEL DH100ACDLP, INCLUDED WITH EACH DETECTOR. SHALL BE ONE REMOTE INDICATOR/TEST SWITCH, SYSTEM SENSOR MODEL S15 OR S110, INCLUDED SHALL BE ONE END OF LINE POWER SUPERVISION RELAY, SILENT KNIGHT MODEL 160150 FOR EACH ZONE OF DETECTORS.
D. THE FIRE-SUPPRESSION SYSTEM CONTRACTOR SHALL PROVIDE WATERFLOW AND VALVE TAMPER SWITCHES.

END OF SECTION



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