

SECTION 260500

SECTION 260519

SECTION 260560

SECTION 262416

GENERAL REQUIREMENTS FOR ELECTRICAL WORK

LOW VOLTAGE ELECTRICAL CONDUCTORS

INSTALLATION OF WIRE AND CABLE

PANELBOARDS

PART 1 - GENERAL

PART 1 - GENERAL

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1.1 REFERENCES

1.1 GENERAL

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A. AS USED IN THIS SECTION, "PROVIDE" MEANS "FURNISH AND INSTALL". "FURNISH" MEANS "TO PURCHASE AND DELIVER TO THE PROJECT SITE COMPLETE WITH EVERY NECESSARY APPURTENANCE AND SUPPORT AND TO STORE IN A SECURE AREA IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS", AND "INSTALL" MEANS "TO UNLOAD AT THE DELIVERY POINT AT THE SITE OR RETRIEVE FROM STORAGE, MOVE TO POINT OF INSTALLATION AND PERFORM EVERY OPERATION NECESSARY TO ESTABLISH SECURE MOUNTING AND CORRECT OPERATION AT THE PROPER LOCATION IN THE PROJECT".

A. THE PROVISIONS OF SECTION 260500, GENERAL REQUIREMENTS FOR ELECTRICAL WORK APPLY TO THE WORK OF THIS SECTION.

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1.2 EXAMINATION OF SITE

1.2 CODES AND STANDARDS

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A. BEFORE SUBMITTING A BID, THE ELECTRICAL CONTRACTOR SHALL VISIT AND CAREFULLY EXAMINE SITE TO IDENTIFY EXISTING CONDITIONS AND DIFFICULTIES THAT MAY AFFECT THE WORK OF THIS SECTION. NO EXTRA PAYMENT WILL BE ALLOWED FOR ADDITIONAL WORK CAUSED BY UNFAMILIARITY WITH SITE CONDITIONS.

A. PRODUCTS SHALL COMPLY WITH THE FOLLOWING CODES AND STANDARDS AND SHALL BE UL LISTED AND LABELED WHERE APPLICABLE.
ASTM B-3 SOFT OR ANNEALED COPPER WIRE
ASTM B-8 CONCENTRIC LAY STRANDED COPPER CONDUCTORS
NEMA WC-5 THERMOPLASTIC INSULATED WIRE AND CABLE FOR THE TRANSMISSION AND DISTRIBUTION OF ELECTRICAL ENERGY.
UL 44 RUBBER INSULATED WIRES AND CABLES
UL 83 THERMOPLASTIC INSULATED WIRES AND CABLES

A. PRODUCTS SHALL COMPLY WITH THE FOLLOWING CODES AND STANDARDS AND SHALL BE UL-LISTED AND LABELED WHERE APPLICABLE.
UL 486A WIRE CONNECTORS AND SOLDERING LUGS FOR USE WITH COPPER CONDUCTORS.
UL 510 ELECTRICAL INSULATING TAPE

A. PRODUCTS SHALL COMPLY WITH THE FOLLOWING CODES AND STANDARDS AND SHALL BE UL LISTED AND LABELED:
NEMA AB-1 MOLDED CASE CIRCUIT BREAKERS
NEMA PB-1 PANELBOARDS
UL 50 ENCLOSURES FOR ELECTRICAL EQUIPMENT
UL 67 PANELBOARDS
UL 489 MOLDED CASE CIRCUIT BREAKERS AND CIRCUIT BREAKER ENCLOSURES

B. BEFORE STARTING WORK IN A PARTICULAR AREA OF THE PROJECT, THE ELECTRICAL CONTRACTOR SHALL EXAMINE THE CONDITIONS UNDER WHICH WORK MUST BE PERFORMED INCLUDING PREPARATORY WORK PERFORMED UNDER OTHER TRADES, AND REPORT CONDITIONS THAT MIGHT ADVERSELY AFFECT THE WORK IN WRITING TO CONSTRUCTION MANAGER. COMMENCEMENT OF WORK SHALL BE CONSTRUED AS COMPLETE ACCEPTANCE OF EXISTING CONDITIONS AND PREPARATORY WORK.

1.3 SUBMITTALS

PART 2 - PRODUCTS

1.3 SUBMITTALS

1.3 SCOPE

A. MANUFACTURER'S PRODUCT DATA SHEETS.

A. WIRE AND CABLE ARE SPECIFIED IN OTHER SECTIONS OF DIVISION 26.

A. MANUFACTURER'S PRODUCT DATA SHEETS.

A. THE WORK TO BE ACCOMPLISHED UNDER THESE SPECIFICATIONS INCLUDES PROVIDING ALL LABOR, MATERIALS, EQUIPMENT, CONSUMABLE ITEMS, SUPERVISION, ADMINISTRATIVE TASKS, TESTS AND DOCUMENTATION REQUIRED TO INSTALL COMPLETE AND FULLY OPERATIONAL ELECTRICAL SYSTEMS AS DESCRIBED HEREIN AND SHOWN ON THE DRAWINGS. THE ELECTRICAL CONTRACTOR SHALL COMPLETELY COORDINATE THE WORK OF THIS SECTION WITH THE WORK OF OTHER TRADES.

PART 2 - PRODUCTS

2.2 TERMINATIONS AND SPLICES

B. CIRCUIT BREAKER SCHEDULES.

B. THE ELECTRICAL CONTRACTOR SHALL FILE PLANS, OBTAIN PERMITS AND LICENSES, PAY FEES AND OBTAIN NECESSARY INSPECTIONS AND APPROVALS FROM AUTHORITIES THAT HAVE JURISDICTION, AS REQUIRED TO PERFORM WORK IN ACCORDANCE WITH ALL LEGAL REQUIREMENTS. THE ELECTRICAL CONTRACTOR SHALL PAY UTILITY BACKCHARGES AND EXCESS COSTS AND PERFORM WORK IN ACCORDANCE WITH UTILITY COMPANY REQUIREMENTS.

2.1 GENERAL

A. POWER WIRING:

1.4 MANUFACTURERS

C. THE WORK SHALL BE COMPLETE FROM POINT OF SERVICE TO EACH OUTLET OR DEVICE WITH ALL ACCESSORY CONSTRUCTION AND MATERIALS REQUIRED TO MAKE EACH ITEM OF EQUIPMENT OR SYSTEM COMPLETE AND READY FOR OPERATION. THE WORK SHALL INCLUDE BUT NOT BE LIMITED TO THE FOLLOWING.

A. ALL CONDUCTORS SHALL BE ANNEALED COPPER IN ACCORDANCE WITH ASTM B-3.

1. TERMINAL LUGS, CONNECTORS AND SPLICES SHALL BE TIN PLATED, HIGH CONDUCTIVITY COPPER COMPRESSION TYPE. THEY SHALL HAVE CHAMFERED BARRELS AND BE PERMANENTLY IDENTIFIED WITH CONDUCTOR SIZES.

A. SUBJECT TO COMPLIANCE WITH THE REQUIREMENTS OF THIS SECTION:

1. COMPLETE POWER AND LIGHTING SYSTEMS INCLUDING NEW PANELBOARD, OVERCURRENT DEVICES, RACEWAY, BOXES, CABLE AND WIRE.

B. THE JACKET OF ALL WIRE SHALL BE PRINTED WITH THE FOLLOWING INFORMATION:

2. TERMINAL LUGS FOR CONDUCTORS NO. 3/0 AWG AND LARGER SHALL BE LONG BARREL NEMA TWO HOLE TYPE.
3. SPLICES SHALL BE LONG BARREL BUTT TYPE WITH A CENTER STOP IN THE SPLICE BARREL.
4. HYDRAULIC CRIMPING TOOLS WITH PROPER DIE SIZES WHICH REQUIRE FULL CLOSURE BEFORE REOPENING SHALL BE USED.

SQUARE D

2. BRANCH CIRCUITS AND DEVICES FOR POWER AND CONVENIENCE RECEPTACLES.

1. MANUFACTURER
2. SIZE
3. INSULATION TYPE
4. MAXIMUM VOLTAGE
5. UL LABEL

C. ALL INSULATION SHALL BE RATED 600 VOLT.

PART 2 - PRODUCTS

3. COMPLETE INTERIOR LIGHTING SYSTEM INCLUDING NORMAL AND EMERGENCY FIXTURES, EXIT SIGNS, LAMPS, CONTROLS, TRIM AND ACCESSORIES.

C. ALL INSULATION SHALL BE RATED 600 VOLT.

B. LIGHTING AND BRANCH CIRCUITS

2.1 GENERAL

4. EXTENSION OF EXISTING FIRE ALARM AND DETECTION SYSTEM INCLUDING NOTIFICATION APPLIANCES, AND OTHER DEVICES SHOWN ON THE DRAWINGS.

A. FEEDERS AND MOTOR BRANCH CIRCUITS SHALL BE TYPE XHHW-2.

1. SPLICES AND TAPS IN LIGHTING AND BRANCH CIRCUIT WIRING SHALL BE 3M SCOTCHLOK SPRING CONNECTORS OR EQUAL.

A. PANELBOARDS SHALL BE OF THE SIZES, RATING AND ARRANGEMENT SHOWN ON THE DRAWINGS.

5. EMPTY OUTLET BOXES AND CONDUIT WITH PULL STRING FROM BOX TO NEW CABLE TRAY ABOVE CEILING FOR VOICE/DATA LOCATIONS, WIRING, JACKS AND TERMINATIONS ARE BY THE OWNER.

2.2 POWER WIRING

C. METAL CLAD CABLE CONNECTORS.

B. PANELBOARDS SHALL BE PROVIDED COMPLETE WITH ALL OVERCURRENT DEVICES, ACCESSORIES AND TRIM.

6. CONTROL WIRING NOT PROVIDED BY DIVISION 23.

B. ALL POWER WIRING SHALL BE STRANDED, CLASS B STRAND IN ACCORDANCE WITH ASTM B-8, MINIMUM SIZE #12 AWG.

1. FOR NON-JACKETED METAL CLAD CABLE IN DRY LOCATIONS, CABLE TERMINATIONS SHALL BE O.Z. GEDNEY TYPE PK FOR USE WITH GALVANIZED STEEL ARMOR OR TYPE PK-A FOR USE WITH ALUMINUM ARMOR, CABLE TERMINATIONS SHALL BE PROVIDED WITH LOCKNUTS AND BUSHINGS.

C. ALL PANELBOARDS SHALL BE PROVIDED WITH SAFETY BARRIERS FOR DEAD FRONT CONSTRUCTION.

7. GROUNDING.

A. ALL LIGHTING AND CONVENIENCE RECEPTACLE BRANCH CIRCUIT WIRING SHALL BE TYPE THHN/THWN.

2. UNDERGROUND CONDUIT: RNC, TYPE EPC-40-PVC

D. THE REQUIRED SHORT CIRCUIT RATINGS OF ASSEMBLED PANELBOARDS ARE SHOWN ON THE DRAWINGS. THE SHORT CIRCUIT RATING OF EVERY OVERCURRENT DEVICE IN THE PANEL SHALL MEET OR EXCEED THE PANEL RATING. UNLESS OTHERWISE NOTED ON THE DRAWINGS, SERIES RATED COMBINATIONS WILL NOT BE PERMITTED.

8. ALL SUPPORT MATERIAL AND HARDWARE FOR RACEWAY AND ELECTRICAL EQUIPMENT.

B. BRANCH CIRCUIT WIRING SHALL BE SOLID OR STRANDED CONDUCTOR, MINIMUM SIZE #12 AWG.

PART 3 - EXECUTION

E. PROVIDE THROUGH-FEED OR SUB-FEED LUGS AS INDICATED ON PANEL SCHEDULES.

9. BRANCH CIRCUITS TO CONTROL PANELS AND DEVICES FURNISHED UNDER OTHER SECTIONS.

A. WIRING FOR CONTROL CIRCUITS SHALL BE THHN/THWN.

3.1 RACEWAY APPLICATION

2.2 CABINETS

10. TERMINATION OF ALL CABLE AND WIRE UNLESS OTHERWISE NOTED.

B. CONTROL WIRING SHALL BE STRANDED, CLASS B STRAND IN ACCORDANCE WITH ASTM B-8, MINIMUM SIZE #14 AWG.

A. OUTDOORS: APPLY RACEWAY PRODUCTS AS SPECIFIED BELOW UNLESS OTHERWISE INDICATED:

A. BOXES SHALL BE CODE GAUGE GALVANIZED SHEET STEEL.

11. SEALING OF CEILING, WALL AND FLOOR PENETRATIONS.

A. WHERE HIGH TEMPERATURE FIXTURE WIRE IS REQUIRED IT SHALL BE SILICONE RUBBER TYPE SF-2.

1. EXPOSED CONDUIT: GRC.
2. CONCEALED CONDUIT, ABOVEGROUND: GRC.
3. UNDERGROUND CONDUIT: RNC, TYPE EPC-40-PVC
4. BOXES AND ENCLOSURES, ABOVEGROUND: NEMA 250, TYPE 4X.

B. TRIM SHALL BE CODE GAUGE STEEL, ANSI-61 GRAY FINISH WITH STAINLESS STEEL FLUSH TYPE LOCKLATCH HANDLE. ALL LOCKS SHALL BE KEYPED ALIKE.

1.4 RELATED WORK IN OTHER SECTIONS

A. ALL WIRE SHALL BE INSTALLED IN ACCORDANCE WITH SECTION 260560, INSTALLATION OF WIRE AND CABLE.

B. INDOORS: APPLY RACEWAY PRODUCTS AS SPECIFIED BELOW UNLESS OTHERWISE INDICATED:

C. TRIM FOR SURFACE MOUNTED PANELS SHALL BE DOOR-IN-DOOR CONSTRUCTION SUCH THAT THE GUTTER SPACE MAY BE EXPOSED BY A HINGED DOOR.

A. THE FOLLOWING WORK IS NOT INCLUDED IN THIS SECTION AND SHALL BE PERFORMED UNDER OTHER SECTIONS:

A. WIRING FOR CONTROL CIRCUITS SHALL BE THHN/THWN.

1. EXPOSED, NOT SUBJECT TO SEVERE PHYSICAL DAMAGE: EMT.
2. EXPOSED AND SUBJECT TO SEVERE PHYSICAL DAMAGE: GRC. RACEWAY LOCATIONS INCLUDE MECHANICAL ROOMS.
3. CONCEALED IN CEILINGS AND INTERIOR WALLS AND PARTITIONS: TYPE MC CABLE.
4. CONNECTION TO VIBRATING EQUIPMENT (INCLUDING TRANSFORMERS AND HYDRAULIC, PNEUMATIC, ELECTRIC SOLENOID, OR MOTOR-DRIVEN EQUIPMENT); FMC, EXCEPT USE LFMC IN DAMP OR WET LOCATIONS.
5. DAMP OR WET LOCATIONS: GRC.
6. BOXES AND ENCLOSURES: NEMA 250, TYPE 1, EXCEPT USE NEMA 250, TYPE 4 STAINLESS STEEL IN DAMP OR WET LOCATIONS.
7. ALL EMERGENCY BRANCH CIRCUITS AND FEEDERS TO BE INSTALLED IN EMT.

D. DIRECTORY FRAMES SHALL BE METAL FRAME WITH PLASTIC COVERS.

1. CONCRETE WORK, INCLUDING CONCRETE HOUSEKEEPING PADS AND OTHER PADS AND BLOCKS FOR VIBRATING AND ROTATING EQUIPMENT.

B. BRANCH CIRCUIT WIRING SHALL BE SOLID OR STRANDED CONDUCTOR, MINIMUM SIZE #12 AWG.

A. MINIMUM RACEWAY SIZE: 3/4"-TRADE SIZE

A. ALL BUS WORK SHALL BE COPPER.

2. CUTTING AND PATCHING OF MASONRY, CONCRETE, TILE, AND OTHER PARTS OF STRUCTURE, WITH THE EXCEPTION OF DRILLING FOR HANGERS AND PROVIDING HOLES AND OPENINGS IN METAL DECKS.

A. WIRING FOR CONTROL CIRCUITS SHALL BE THHN/THWN.

B. RACEWAY FITTINGS: COMPATIBLE WITH RACEWAYS AND SUITABLE FOR USE AND LOCATION.

B. NEUTRAL BUSES SHALL BE 100% RATED WITH ADEQUATE CONNECTIONS FOR ALL OUTGOING NEUTRAL CONDUCTORS.

3. PAINTING.

B. CONTROL WIRING SHALL BE STRANDED, CLASS B STRAND IN ACCORDANCE WITH ASTM B-8, MINIMUM SIZE #14 AWG.

1. RIGID AND INTERMEDIATE STEEL CONDUIT: USE THREADED RIGID STEEL CONDUIT FITTINGS UNLESS OTHERWISE INDICATED. COMPLY WITH NEMA FB 2.10.
2. PVC EXTERNALLY COATED, RIGID STEEL CONDUITS: USE ONLY FITTINGS LISTED FOR USE WITH THIS TYPE OF CONDUIT. PATCH AND SEAL ALL JOINTS, NICKS, AND SCRAPES IN PVC COATING AFTER INSTALLING CONDUITS AND FITTINGS. USE SEALANT RECOMMENDED BY FITTING MANUFACTURER AND APPLY IN THICKNESS AND NUMBER OF COATS RECOMMENDED BY MANUFACTURER.
3. EMT: USE SETSCREW OR COMPRESSION, STEEL FITTINGS, COMPLY WITH NEMA FB 2.10.
4. FLEXIBLE CONDUIT: USE ONLY FITTINGS LISTED FOR USE WITH FLEXIBLE CONDUIT. COMPLY WITH NEMA FB 2.20.

C. PANELBOARDS SHALL BE PROVIDED WITH COPPER GROUND BUSES.

4. TEMPORARY WATER, HEAT, GAS AND SANITARY FACILITIES FOR USE DURING CONSTRUCTION.

A. WIRING FOR CONTROL CIRCUITS SHALL BE THHN/THWN.

C. DO NOT INSTALL ALUMINUM CONDUITS, BOXES, OR FITTINGS IN CONTACT WITH CONCRETE OR EARTH.

D. GROUND FAULT AND ARC FAULT CIRCUIT BREAKERS SHALL REQUIRE NO MORE PANEL SPACE THAN STANDARD BREAKERS.

5. CONTROL WIRING SPECIFICALLY INDICATED AS PART OF DIVISION 23.

PART 3 - EXECUTION

A. RACEWAYS SHALL BE SUBSTANTIALLY COMPLETED BEFORE ANY WIRING IS INSTALLED IN THEM, BEFORE ANY WIRING IS PULLED INTO A CONDUIT, THE CONDUIT SHALL BE CLEANED AND TESTED FOR OBSTRUCTIONS AND CLEARED OF FOREIGN MATERIAL THAT MAY BE FOUND.

E. ALL CONNECTIONS SHALL BE RATED FOR 75° C COPPER CONDUCTORS.

B. THE ELECTRICAL CONTRACTOR SHALL IDENTIFY LOCATIONS OF PENETRATIONS, STRUCTURAL SUPPORTS, ETC. REQUIRED FOR THE COMPLETION OF THE WORK OF THIS SECTION TO THE GENERAL CONTRACTOR IN A TIMELY MANNER.

A. ALL WIRE SHALL BE INSTALLED IN ACCORDANCE WITH SECTION 260560, INSTALLATION OF WIRE AND CABLE.

B. PULLING INTO RACEWAYS

A. OVERCURRENT DEVICES SHALL BE TRIP-FREE MOLDED CASE, BOLT-ON, THERMAL-MAGNETIC CIRCUIT BREAKERS.

1.5 CODES, STANDARDS, AND AUTHORITIES

A. ALL WIRE SHALL BE INSTALLED IN ACCORDANCE WITH SECTION 260560, INSTALLATION OF WIRE AND CABLE.

A. ALL POSSIBLE CARE SHALL BE TAKEN IN PULLING OF WIRING INTO CONDUITS OR OTHER RACEWAYS. THE CABLE REELS OR COILS SHALL BE SET UP IN SUCH A WAY THAT THE CONDUCTOR MAY BE TRAINED INTO THE RACEWAY AS DIRECTLY AS POSSIBLE WITH A MINIMUM NUMBER OF CHANGES OF DIRECTION OR AMOUNT OF BENDING. WHERE SEVERAL CABLES ARE CONTAINED IN ONE CONDUIT, ALL SUCH CABLES SHALL BE PULLED IN TOGETHER.

B. MAIN CIRCUIT BREAKERS SHALL BE INDIVIDUALLY MOUNTED AND BOLTED TO BUS ASSEMBLY. BACK-FED BRANCH MOUNTED CIRCUIT BREAKERS ARE PROHIBITED.

A. ALL WORK SHALL BE PERFORMED STRICTLY AS REQUIRED BY RULES, REGULATIONS, STANDARDS, CODES, ORDINANCES, AND LAWS OF LOCAL, STATE, AND FEDERAL GOVERNMENTS, AND OTHER AUTHORITIES THAT HAVE LAWFUL JURISDICTION. ADDITIONALLY, MATERIALS AND EQUIPMENT SHALL BE MANUFACTURED, INSTALLED AND TESTED AS SPECIFIED IN LATEST EDITIONS, (EXCEPT WHERE NOTED OTHERWISE), OF PUBLICATIONS, STANDARDS, RULINGS, AND DETERMINATIONS OF:

A. WIRING FOR CONTROL CIRCUITS SHALL BE THHN/THWN.

B. THE USE OF PULLING LUBRICANTS SHALL BE RESTRICTED TO NON-HARDENING TYPE, APPROVED BY UL AND THE CABLE MANUFACTURER.

C. FRONT FACES OF ALL CIRCUIT BREAKERS SHALL BE FLUSH. TRIP INDICATION SHALL BE CLEARLY SHOWN BY THE HANDLE POSITION BETWEEN THE ON AND OFF POSITIONS.

1. LOCAL AND STATE BUILDING, PLUMBING, MECHANICAL, ELECTRICAL, FIRE AND HEALTH DEPARTMENT AND PUBLIC SAFETY CODES AGENCIES.

A. WIRING FOR CONTROL CIRCUITS SHALL BE THHN/THWN.

C. WHERE TERMINATIONS ARE MADE ON INSULATED BUSES, THE TERMINATIONS SHALL BE INSULATED USING THE PROPER TAPE(S) AND FILLERS FOR THE VOLTAGE LEVEL OF THE CABLE.

D. GROUND FAULT AND ARC FAULT CIRCUIT BREAKERS SHALL REQUIRE NO MORE PANEL SPACE THAN STANDARD BREAKERS.

2. INTERNATIONAL BUILDING CODE (IBC), 2015 EDITION.

A. WIRING FOR CONTROL CIRCUITS SHALL BE THHN/THWN.

D. CONNECTIONS IN MOTOR TERMINAL BOXES SHALL BE MADE BY INSTALLING COMPRESSION TYPE LUGS ON THE MOTOR BRANCH CIRCUIT CONDUCTORS AND THE MOTOR LEADS AND BOLTING THE LUGS TOGETHER THEN INSULATING WITH MOTOR LEAD CONNECTION KITS, RAYCHEM, 3M OR EQUAL.

E. ALL CONNECTIONS SHALL BE RATED FOR 75° C COPPER CONDUCTORS.

3. INTERNATIONAL FIRE CODE (IFC), 2015 EDITION.

A. WIRING FOR CONTROL CIRCUITS SHALL BE THHN/THWN.

A. ALL POWER AND CONTROL WIRING SHALL BE CONTINUOUS AND SHALL NOT BE SPLICED UNLESS OTHERWISE INDICATED ON THE DRAWINGS.

A. OVERCURRENT DEVICES SHALL BE TRIP-FREE MOLDED CASE, BOLT-ON, THERMAL-MAGNETIC CIRCUIT BREAKERS.

4. INTERNATIONAL ENERGY CONSERVATION CODE (IECC), 2012 EDITION.

A. WIRING FOR CONTROL CIRCUITS SHALL BE THHN/THWN.

B. BOLTS, NUTS AND HARDWARE USED FOR TERMINATIONS SHALL BE SILICONE BRONZE.

B. MAIN CIRCUIT BREAKERS SHALL BE INDIVIDUALLY MOUNTED AND BOLTED TO BUS ASSEMBLY. BACK-FED BRANCH MOUNTED CIRCUIT BREAKERS ARE PROHIBITED.

5. NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

A. WIRING FOR CONTROL CIRCUITS SHALL BE THHN/THWN.

C. WHERE TERMINATIONS ARE MADE ON INSULATED BUSES, THE TERMINATIONS SHALL BE INSULATED USING THE PROPER TAPE(S) AND FILLERS FOR THE VOLTAGE LEVEL OF THE CABLE.

C. PANELBOARDS SHALL BE PROVIDED WITH COPPER GROUND BUSES.

6. OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA)

A. WIRING FOR CONTROL CIRCUITS SHALL BE THHN/THWN.

D. CONNECTIONS IN MOTOR TERMINAL BOXES SHALL BE MADE BY INSTALLING COMPRESSION TYPE LUGS ON THE MOTOR BRANCH CIRCUIT CONDUCTORS AND THE MOTOR LEADS AND BOLTING THE LUGS TOGETHER THEN INSULATING WITH MOTOR LEAD CONNECTION KITS, RAYCHEM, 3M OR EQUAL.

D. GROUND FAULT AND ARC FAULT CIRCUIT BREAKERS SHALL REQUIRE NO MORE PANEL SPACE THAN STANDARD BREAKERS.

7. FACTORY MUTUAL ASSOCIATION (FM)

A. WIRING FOR CONTROL CIRCUITS SHALL BE THHN/THWN.

A. ALL POWER AND CONTROL WIRING SHALL BE CONTINUOUS AND SHALL NOT BE SPLICED UNLESS OTHERWISE INDICATED ON THE DRAWINGS.

E. ALL CONNECTIONS SHALL BE RATED FOR 75° C COPPER CONDUCTORS.

8. NATIONAL ELECTRICAL CODE (NEC), 2014 EDITION.

A. WIRING FOR CONTROL CIRCUITS SHALL BE THHN/THWN.

B. BOLTS, NUTS AND HARDWARE USED FOR TERMINATIONS SHALL BE SILICONE BRONZE.

E. ALL CONNECTIONS SHALL BE RATED FOR 75° C COPPER CONDUCTORS.

9. NATIONAL ELECTRICAL SAFETY CODE (NESC).

A. WIRING FOR CONTROL CIRCUITS SHALL BE THHN/THWN.

C. WHERE TERMINATIONS ARE MADE ON INSULATED BUSES, THE TERMINATIONS SHALL BE INSULATED USING THE PROPER TAPE(S) AND FILLERS FOR THE VOLTAGE LEVEL OF THE CABLE.

E. ALL CONNECTIONS SHALL BE RATED FOR 75° C COPPER CONDUCTORS.

B. ALL MATERIALS AND EQUIPMENT SHALL BE LISTED BY UNDERWRITERS LABORATORIES (UL), AND APPROVED FOR INTENDED SERVICE.

A. WIRING FOR CONTROL CIRCUITS SHALL BE THHN/THWN.

D. CONNECTIONS IN MOTOR TERMINAL BOXES SHALL BE MADE BY INSTALLING COMPRESSION TYPE LUGS ON THE MOTOR BRANCH CIRCUIT CONDUCTORS AND THE MOTOR LEADS AND BOLTING THE LUGS TOGETHER THEN INSULATING WITH MOTOR LEAD CONNECTION KITS, RAYCHEM, 3M OR EQUAL.

E. ALL CONNECTIONS SHALL BE RATED FOR 75° C COPPER CONDUCTORS.

C. WHEN REQUIREMENTS CITED IN THIS PARAGRAPH CONFLICT WITH EACH OTHER OR WITH CONTRACT DOCUMENTS, THE MOST STRINGENT REQUIREMENTS SHALL GOVERN CONDUCT OF WORK.

A. WIRING FOR CONTROL CIRCUITS SHALL BE THHN/THWN.

A. ALL POWER AND CONTROL WIRING SHALL BE CONTINUOUS AND SHALL NOT BE SPLICED UNLESS OTHERWISE INDICATED ON THE DRAWINGS.

E. ALL CONNECTIONS SHALL BE RATED FOR 75° C COPPER CONDUCTORS.

1.6 CONTRACT DRAWINGS

A. WIRING FOR CONTROL CIRCUITS SHALL BE THHN/THWN.

B. BOLTS, NUTS AND HARDWARE USED FOR TERMINATIONS SHALL BE SILICONE BRONZE.

E. ALL CONNECTIONS SHALL BE RATED FOR 75° C COPPER CONDUCTORS.

A. WORK TO BE PERFORMED UNDER THIS SECTION IS SHOWN ON THE CONTRACT DRAWINGS AND DESCRIBED IN THE SPECIFICATIONS.

A. WIRING FOR CONTROL CIRCUITS SHALL BE THHN/THWN.

C. WHERE TERMINATIONS ARE MADE ON INSULATED BUSES, THE TERMINATIONS SHALL BE INSULATED USING THE PROPER TAPE(S) AND FILLERS FOR THE VOLTAGE LEVEL OF THE CABLE.

E. ALL CONNECTIONS SHALL BE RATED FOR 75° C COPPER CONDUCTORS.

B. THE LISTING OF ELECTRICAL DRAWINGS DOES NOT LIMIT RESPONSIBILITY OF DETERMINING THE FULL EXTENT OF WORK REQUIRED BY CONTRACT DOCUMENTS. THE ELECTRICAL CONTRACTOR SHALL REFER TO ARCHITECTURAL, PLUMBING, HVAC, STRUCTURAL, AND OTHER DRAWINGS AND OTHER SECTIONS THAT INDICATE TYPES OF CONSTRUCTION WITH WHICH WORK OF THIS SECTION MUST BE COORDINATED. ELECTRICAL CONTRACTOR SHALL CHECK WITH THE GENERAL CONTRACTOR AND OTHER TRADES TO DETERMINE WHETHER THERE WILL BE ANY INTERFERENCE BY SUCH TRADES WITH THE ELECTRICAL WORK. IF THE ELECTRICAL CONTRACTOR FAILS TO CHECK WITH THE GENERAL CONTRACTOR AND THE ELECTRICAL WORK IS LATER FOUND TO INTERFERE WITH THEIR OTHER WORK, THE ELECTRICAL CONTRACTOR SHALL MAKE NECESSARY CHANGES, WITHOUT ADDITIONAL COST TO THE OWNER, TO ELIMINATE SUCH INTERFERENCE.

A. WIRING FOR CONTROL CIRCUITS SHALL BE THHN/THWN.

D. CONNECTIONS IN MOTOR TERMINAL BOXES SHALL BE MADE BY INSTALLING COMPRESSION TYPE LUGS ON THE MOTOR BRANCH CIRCUIT CONDUCTORS AND THE MOTOR LEADS AND BOLTING THE LUGS TOGETHER THEN INSULATING WITH MOTOR LEAD CONNECTION KITS, RAYCHEM, 3M OR EQUAL.

E. ALL CONNECTIONS SHALL BE RATED FOR 75° C COPPER CONDUCTORS.

A. ALL RACEWAY AND NON-CURRENT CARRYING METAL EQUIPMENT AND ENCLOSURES SHALL BE ELECTRICALLY CONTINUOUS AND BONDED TO THE GROUNDING SYSTEM.

A. WIRING FOR CONTROL CIRCUITS SHALL BE THHN/THWN.

A. ALL POWER WIRING CONDUCTORS SHALL BE COLOR CODED AS FOLLOWS:

E. ALL CONNECTIONS SHALL BE RATED FOR 75° C COPPER CONDUCTORS.

B. WHERE EQUIPMENT IS PROVIDED WITH A GROUND BUS, ALL EQUIPMENT GROUNDING CONDUCTORS SHALL BE TERMINATED ON THE BUS. THE ELECTRICAL CONTRACTOR SHALL PERFORM ALL DRILLING AND TAPPING REQUIRED AND PROVIDE ALL HARDWARE.

A. WIRING FOR CONTROL CIRCUITS SHALL BE THHN/THWN.

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