SECTION 260500

GENERAL REQUIREMENTS FOR ELECTRICAL WORK

PART 1 - GENERAL

1.1 REFERENCES

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".

1.2 EXAMINATION OF SITE

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.

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 SCOPE

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 OTHER TRADES.

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.

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.

1. COMPLETE POWER AND LIGHTING DISTRIBUTION SYSTEMS INCLUDING, LIGHTING AND RECEPTACLE PANELBOARDS, OVERCURRENT DEVICES, RACEWAY, CABLE AND WIRE.
2. BRANCH CIRCUITS AND DEVICES FOR POWER AND CONVENIENCE RECEPTACLES.
3. COMPLETE INTERIOR LIGHTING SYSTEM INCLUDING NORMAL AND EMERGENCY FIXTURES, EXIT SIGNS, LAMPS, CONTROLS, TRIM AND ACCESSORIES.
4. EXTENSION OF EXISTING FIRE ALARM AND DETECTION SYSTEM INCLUDING PULL STATIONS, AREA SMOKE DETECTORS, INDICATING APPLIANCES, AUXILIARY CONTACTS FOR EQUIPMENT INTERLOCKING, AND OTHER DEVICES SHOWN ON THE DRAWINGS.
5. PROVIDE ALL PATHWAYS, ROUGH-IN, CONDUIT, CABLE TRAY AND EMPTY OUTLET BOXES FOR VOICE/DATA WIRING. WIRING, JACKS AND TERMINATION SHALL BE BY OWNER. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH MINE HEALTH NETWORK ENGINEERING INFRASTRUCTURE SPECIFICATIONS DATE MAY 2017.
6. CONTROL WIRING NOT PROVIDED BY DIVISION 23.
7. GROUNDING.
8. ALL SUPPORT MATERIAL AND HARDWARE FOR RACEWAY AND ELECTRICAL EQUIPMENT.
9. BRANCH CIRCUITS TO CONTROL PANELS AND DEVICES FURNISHED UNDER OTHER SECTIONS.
10. TERMINATION OF ALL CABLE AND WIRE UNLESS OTHERWISE NOTED.
11. INSTALLATION OF ACCESS PANELS IN CEILINGS AND WALL CONSTRUCTION.
12. SEALING OF CEILING, WALL AND FLOOR PENETRATIONS.
13. DEMOLITION.

1.4 RELATED WORK IN OTHER SECTIONS

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

1. CONCRETE WORK, INCLUDING CONCRETE HOUSEKEEPING PADS AND OTHER PADS AND BLOCKS FOR VIBRATING AND ROTATING EQUIPMENT.
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.
3. PAINTING.
4. TEMPORARY WATER, HEAT, GAS AND SANITARY FACILITIES FOR USE DURING CONSTRUCTION.
5. CONTROL WIRING SPECIFICALLY INDICATED AS PART OF DIVISION 23.

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.

1.5 CODES, STANDARDS, AND AUTHORITIES

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:

1. LOCAL AND STATE BUILDING, PLUMBING, MECHANICAL, ELECTRICAL, FIRE AND HEALTH DEPARTMENT AND PUBLIC SAFETY CODES AGENCIES.
2. INTERNATIONAL BUILDING CODE (IBC). 2009 EDITION.
3. INTERNATIONAL FIRE CODE (IFC). 2015 EDITION.
4. INTERNATIONAL ENERGY CONSERVATION CODE (IECC). 2009 EDITION.
5. NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
6. OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA)
7. FACTORY MUTUAL ASSOCIATION (FM)
8. NATIONAL ELECTRICAL CODE (NEC). 2014 EDITION.
9. NATIONAL ELECTRICAL SAFETY CODE (NESC).
10. MAINE HEALTH NETWORK ENGINEERING INFRASTRUCTURE SPECIFICATIONS DATED MAY 2017.

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

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

1.6 CONTRACT DRAWINGS

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

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.

SECTION 260519

LOW VOLTAGE ELECTRICAL CONDUCTORS

PART 1 - GENERAL

1.1 GENERAL

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

1.2 CODES AND STANDARDS

A. PRODUCTS SHALL COMPLY WITH THE FOLLOWING CODES AND STANDARDS AND SHALL BE UL_LISTED AND LABELED:

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

1.3 SUBMITTALS

A. MANUFACTURER'S PRODUCT DATA SHEETS.

PART 2 - PRODUCTS

2.1 GENERAL

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

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

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

C. ALL INSULATION SHALL BE RATED 600 VOLT.

2.2 POWER WIRING

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

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

2.3 BRANCH CIRCUITS

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

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

2.4 CONTROL WIRING

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

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

2.5 FIXTURE WIRE

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

PART 3 -EXECUTION

3.1 GENERAL

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

END OF SECTION 260519

SECTION 260526

GROUNDING

PART 1 - GENERAL

1.1 GENERAL

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

B. THE ELECTRICAL CONTRACTOR SHALL PROVIDE GROUNDING WHERE REQUIRED INCLUDING GROUNDING ELECTRODE CONDUCTORS, BONDING JUMPERS, EQUIPMENT GROUNDING CONDUCTORS, CONNECTIONS AND OTHER MATERIALS AS MAY BE REQUIRED.

1.2 CODES AND STANDARDS:

A. PRODUCTS SHALL COMPLY WITH THE FOLLOWING CODES AND STANDARDS AND SHALL BE UL LISTED AND LABELED.

NFPA 70	NATIONAL ELECTRICAL CODE
UL 467	GROUNDING AND BONDING EQUIPMENT

PART 2 - PRODUCTS

2.1 CONDUCTORS

A. BARE GROUNDING CONDUCTORS SHALL BE SOFT DRAWN STRANDED COPPER, SIZED IN ACCORDANCE WITH NEC ARTICLE 250, UNLESS OTHERWISE NOTED ON THE DRAWINGS.

B. INSULATED GROUNDING CONDUCTORS SHALL BE STRANDED COPPER WITH TYPE TW, THW OR THHN/THWN INSULATION COLORED GREEN.

2.2 CONNECTIONS

A. WELDED CONNECTIONS SHALL BE EXOTHERMIC REACTION TYPE, CADWELD OR APPROVED EQUAL. THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL MOLDS, CRUCIBLES, WELD METAL AND NECESSARY MATERIALS TO COMPLETE ALL CONNECTIONS.

B. LUGS SHALL BE LONG BARREL, TWO HOLE COMPRESSION TYPE FOR NO. 3/0 AWG WIRE AND LARGER AND SHORT BARREL, ONE HOLE COMPRESSION TYPE FOR GROUNDING CONDUCTORS NO. 2/0 AWG AND SMALLER.

PART 3 - EXECUTION

3.1 EQUIPMENT GROUNDING CONDUCTORS

A. A SEPARATE INSULATED GREEN COPPER CONDUCTOR SHALL BE INSTALLED AS AN EQUIPMENT GROUNDING CONDUCTOR IN ALL RACEWAY AND WITH EVERY FEEDER, BRANCH CIRCUIT AND CONTROL CIRCUIT. THIS SHALL BE IN ADDITION TO THE GROUNDED METALLIC CONDUIT SYSTEM.

B. ALL EQUIPMENT GROUNDING CONDUCTORS SHALL BE TERMINATED AT BOTH ENDS.

3.2 CONNECTIONS

A. ALL CONNECTIONS TO BUILDING STEEL SHALL BE EXOTHERMIC WELD.

B. CONNECTIONS TO EQUIPMENT GROUND BUSSES OR PADS SHALL BE COMPRESSION TYPE LUGS, BOLTED TO THE BUS OR PAD.

C. GROUNDING CONNECTIONS SHALL BE MADE TO CLEAN, DRY SURFACES. ALL SCALE, RUST, PAINT, GREASE AND OTHER CONTAMINATION SHALL BE REMOVED PRIOR TO MAKING CONNECTIONS. UPON COMPLETION OF WELDED CONNECTIONS, ALL SLAG SHALL BE REMOVED.

3.3 RACEWAY AND EQUIPMENT

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

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.

END OF SECTION 260526

SECTION 260560

INSTALLATION OF WIRE AND CABLE

PART 1 - GENERAL

1.1 GENERAL

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

1.2 CODES AND STANDARDS:

A. PRODUCTS SHALL COMPLY WITH THE FOLLOWING CODES AND STANDARDS AND SHALL BE UL-LISTED AND LABELED WHERE APPLICABLE.

UL 486A CONDUCTORS,	WIRE CONNECTORS AND SOLDERING LUGS FOR USE WITH COPPER
UL 510	ELECTRICAL INSULATING TAPE

PART 2 - PRODUCTS

2.1 WIRE AND CABLE

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

2.2 TERMINATIONS AND SPLICES

A. POWER WIRING:

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.
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.

B. LIGHTING AND BRANCH CIRCUITS

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

C. METAL CLAD CABLE CONNECTORS.

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 PKAA FOR USE WITH ALUMINUM ARMOR. CABLE TERMINATIONS SHALL BE PROVIDED WITH LOCKNUTS AND BUSHINGS.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

A. OUTDOORS: APPLY RACEWAY PRODUCTS AS SPECIFIED BELOW UNLESS OTHERWISE INDICATED:
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. INDOORS: APPLY RACEWAY PRODUCTS AS SPECIFIED BELOW UNLESS OTHERWISE INDICATED:
1. EXPOSED, NOT SUBJECT TO PHYSICAL DAMAGE: EMT.
2. EXPOSED AND SUBJECT TO SEVERE PHYSICAL DAMAGE: GRC.
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.

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

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

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

3.2 PREPARATION OF RACEWAYS

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.

3.3 PULLING INTO RACEWAYS

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

3.4 SPLICES AND TERMINATIONS

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

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

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. 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.

3.5 IDENTIFICATION

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

PHASE	208Y/120V	480Y/277V
PHASE A	BLACK	BROWN
PHASE B	RED	ORANGE
PHASE C	BLUE	YELLOW
NEUTRAL	WHITE	GRAY
GROUND	GREEN	GREEN

END OF SECTION 260560

SECTION 262416

PANELBOARDS

PART 1 - GENERAL

1.1 GENERAL

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

1.2 CODES AND STANDARDS

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

1.3 SUBMITTALS

A. MANUFACTURER'S PRODUCT DATA SHEETS.

B. CIRCUIT BREAKER SCHEDULES.

C. DIMENSIONED PLANS, ELEVATIONS, SECTIONS AND DETAILS.

1.4 MANUFACTURERS

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

SQUARE D
GE
SEIMENS
CUTLER HAMMER

PART 2 - PRODUCTS

2.1 GENERAL

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

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

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

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.

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

2.2 CABINETS

A. BOXES SHALL BE CODE GAUGE GALVANIZED SHEET STEEL.

B. TRIM SHALL BE CODE GAUGE STEEL, ANSI-61 GRAY FINISH WITH STAINLESS STEEL FLUSH TYPE LOCK/LATCH HANDLE. ALL LOCKS SHALL BE KEYED ALIKE.

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

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

2.3 BUS

A. ALL BUS WORK SHALL BE COPPER.

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

C. PANELBOARDS SHALL BE PROVIDED WITH COPPER GROUND BUSSES.

D. BUS SHALL BE DESIGNED FOR SEQUENCE PHASE CONNECTION TO ALLOW THE INSTALLATION OF ONE, TWO OR THREE POLE BRANCH CIRCUIT BREAKERS IN ANY POSITION.

2.4 OVERCURRENT DEVICES

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

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

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.

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

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

PART 3 - EXECUTION

3.1 PANELBOARDS

A. PANELBOARDS SHALL BE PROVIDED WITH A LABEL THAT INDICATES PANELBOAD NAME, VOLTAGE, AMPERAGE AND ELECTRICAL DISTRIBUTION EQUIPMENT THAT THE PANELBOARD IS FED FROM.

B. PANELBOARD COVERS ARE REQUIRED TO HAVE 2 LABELS. THE FIRST, AN ARC FLASH WARNING LABEL AND THE SECOND, AN OSHA LABEL REQUIRING 3 FEET, (3 FEET 6 INCHES OR 4 FEET AS APPLICABLE), CLEARANCE IN FRONT OF THE PANEL.

END OF SECTION 262416

CITY OF PORTLAND, MAINE — RESURGAM

Reviewed for Code Compliance
Inspections Division
Approved with Conditions

Date: 02/09/18

REV	DESCRIPTION	DATE
1	ADDENDUM 1	1-9-18
0	ISSUED FOR CONSTRUCTION	12-21-17

ISSUED FOR CONSTRUCTION
12-21-17
CURRENT ISSUE STATUS:

STATE OF MAINE — DANIEL J. TIBBETS — 9830 — LICENSED — PROFESSIONAL ENGINEER — 1/19/18

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M.M.C. HUTCHINS DRIVE
RENOVATION
102 HUTCHINS DRIVE PORTLAND, ME

SPECIFICATIONS

SHEET TITLE:

0 1/4" 1/2" 1" 2" 3"

SCALE: AS NOTED

PROJECT MANAGER:	RSC	PROJECT NO:	17123
A/E OF RECORD:	DJT		
JOB CAPTAIN:	SDL		
DRAWN BY:	CDS		
SMRT FILE:	E-002-17123	SHEET No.	E-002

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