

PART 3 EXECUTION

3.01 GENERAL

- A. PERFORM THE WORK AT SUCH TIME AND IN SUCH MANNER AS TO MINIMIZE INTERFERENCE WITH BUILDING'S NORMAL OPERATION. NOTIFY BUILDING MANAGEMENT REPRESENTATIVES IN ADVANCE EACH TIME A SERVICE OUTAGE OR INTERRUPTION WILL BE REQUIRED FOR THE PERFORMANCE OF SOME PHASE OF THE WORK. SCHEDULE SUCH SERVICE OUTAGE OR INTERRUPTION, ONLY AFTER HAVING RECEIVED APPROVAL OF DATE, HOUR, AND TIME INTERVAL REQUIRED THEREOF. SCHEDULE OF WORK AS DIRECTED SHALL BE FOLLOWED AS CLOSELY AS POSSIBLE.
- B. OPENINGS AROUND ELECTRICAL PENETRATIONS THROUGH FIRE RESISTANCE RATED WALLS, PARTITIONS, FLOORS, OR CEILINGS SHALL BE FIRE STOPPED USING APPROVED METHODS. SEALANT SHALL BE RATED FOR 3 HOURS. TELECOMMUNICATION CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING FIRE STOPPING IN IT' CONDUITS/SLEEVES/PENETRATIONS AFTER IT' WIRES ARE PULLED.
- C. PROVIDE 277/480 VOLT DANGER LABELING AT ALL EQUIPMENT AND JUNCTION/PULL BOXES PER CODE.
- D. MAINTAIN GROUND CONTINUITY THROUGHOUT ALL SYSTEMS.
- E. MAINTAIN CONTINUITY AND PROTECT ALL EXISTING CIRCUITS TO REMAIN SERVING EQUIPMENT WITHIN EXISTING TO REMAIN AREAS. CONTRACTOR SHALL BE RESPONSIBLE TO TRACE ALL EXISTING CIRCUITS TO REMAIN ORIGINATING FROM PANELBOARDS, AND SUBMIT FINDINGS TO ENGINEER FOR CLARIFICATION PRIOR TO THE START OF ANY PANELBOARD WORK. WHENEVER IT IS REQUIRED THAT AN EXISTING CIRCUIT BE MODIFIED, REVISED, DISCONNECTED OR REMOVED IT SHALL BE UNDERSTOOD THAT THE CIRCUIT SHALL BE RECONNECTED AND SERVICE RE-ESTABLISHED IN THE REMAINING PORTION OF THE CIRCUIT AFFECTED BY THE ALTERNATION.
- F. PRIOR TO ANY CHASING, CHOPPING, OR CORE DRILLING BEING PERFORMED, THE CONTRACTOR SHALL FIELD INVESTIGATE CONDITIONS AND COORDINATE WITH ALL APPROPRIATE TRADES TO ENSURE THAT WORK WILL BE IN HARMONY WITH OTHER WORK AND NOT AFFECTED ANY EXISTING BUILDING SYSTEMS. X-RAY SLABS IF REQUIRED. THIS WORK MUST BE APPROVED BY BUILDING MANAGEMENT PRIOR TO PROCEEDING. ALL CORING/CHASING WILL BE DONE ON OVERTIME.
- G. FOR TEMPORARY POWER, FURNISH AND INSTALL WIRING FOR ADEQUATE LIGHT AND SMALL TOOLS POWER FOR THE PROJECT. THIS SHALL INCLUDE STRINGERS, LAMPS, OUTLETS, BREAKERS, AND FUSING, AS IT IS NECESSARY. ALL TEMPORARY WIRING SHALL BE REMOVED FROM SPACE AT COMPLETION OF PROJECT.
- H. FURNISH AND INSTALL A MINIMUM 1" EMPTY CONDUIT FOR ALL WALL MOUNTED LOW VOLTAGE EQUIPMENT JUNCTION BOXES. CONDUIT SHALL BE STUBBED 6" ABOVE HUNG CEILING AND TURNED TOWARDS TERMINATION CLOSET ABOVE ACCESSIBLE CEILING AREA.
- I. COORDINATE WITH THE BUILDING OWNER FOR ANY SERVICE INTERRUPTION OF EXISTING SYSTEMS AND GIVE NOTICE AS REQUIRED BY BUILDING RULES AND REGULATIONS OR A MINIMUM OF TEN (10) BUSINESS DAYS PRIOR TO ANY WORK, WHICHEVER IS MORE STRINGENT. CONTRACTOR IS TO PERFORM WORK ON PREMIUM TIME SO AS TO NOT DISTURB NORMAL BUSINESS OPERATION.
- J. WHEN USING TEMPORARY LIGHTING, THE CONTRACTOR SHALL CLEARLY LABEL PANELS AND BREAKERS USED FOR LIGHTING. LOCATION OF PANELS TO BE SHOWN ON FLOOR PLAN POSTED AT ENTRANCE TO WORK AREA. PROPER TEMPORARY LIGHTING AND POWER MUST BE INSTALLED AND MAINTAINED IN ALL WORK AREAS. CONNECTIONS TO EXISTING AIRWELL AND EXIT LIGHT SYSTEMS ARE NOT PERMITTED.
- K. THE CONTRACTOR SHALL CUT BACK TO THE FLOOR, WALL OR CEILING, REMOVE WIRING AND PLUG BOTH ENDS OF CONCEALED CONDUITS MADE OBSOLETE BY THIS ALTERATION. EXPOSED CONDUITS, WIREWAYS, OUTLET BOXES, PULL BOXES, HANGERS, ETC. MADE OBSOLETE BY THE ALTERATION WORK SHALL BE REMOVED, UNLESS OTHERWISE NOTED.
- L. IT IS POSSIBLE THAT THERE WILL BE CERTAIN REMOVALS AND RELOCATIONS OF THE EXISTING ELECTRICAL INSTALLATION NECESSARY FOR THE SATISFACTORY PERFORMANCE OF THE WORK. THESE CHANGES CANNOT BE COMPLETELY DETAILED ON THE DRAWINGS, BUT MUST BE CONSIDERED BY THE CONTRACTOR WHILE REVIEWING THE EXISTING CONDITIONS AT THE SITE AND PREPARING THE PROPOSAL.

3.02 ELECTRICAL EQUIPMENT INSTALLATION

- A. HEADROOM MAINTENANCE: IF MOUNTING HEIGHTS OR OTHER LOCATION CRITERIA ARE NOT INDICATED, ARRANGE AND INSTALL COMPONENTS AND EQUIPMENT TO PROVIDE THE MAXIMUM POSSIBLE HEADROOM.
- B. MATERIALS AND COMPONENTS: INSTALL LEVEL, PLUMB, AND PARALLEL AND PERPENDICULAR TO OTHER BUILDING SYSTEMS AND COMPONENTS, UNLESS OTHERWISE INDICATED.
- C. EQUIPMENT: INSTALL TO FACILITATE SERVICE, MAINTENANCE, AND REPAIR OR REPLACEMENT OF COMPONENTS. CONNECT FOR EASE OF DISCONNECTING, WITH MINIMUM INTERFERENCE WITH OTHER INSTALLATIONS.
- D. RIGHT OF WAY: GIVE TO RACEWAYS AND PIPING SYSTEMS INSTALLED AT A REQUIRED SLOPE.
- E. PROVIDE CONCRETE BASE FOR ALL FLOOR-MOUNTED ELECTRICAL EQUIPMENT.

3.03 RACEWAY APPLICATION

- A. USE THE FOLLOWING RACEWAYS FOR INDOOR INSTALLATIONS:
  1. EXPOSED: RMC.
  2. CONCEALED: EMT (MC CABLE WHERE PERMISSIBLE ACCORDING TO SECTION 3.06B).
  3. CONNECTION TO VIBRATING EQUIPMENT: FMC; EXCEPT IN WET OR DAMP LOCATIONS, USE LFMC.
  4. DAMP OR WET LOCATIONS: IMC/RMC.
  5. BOXES AND ENCLOSURES: NEMA 250, TYPE 1, UNLESS OTHERWISE INDICATED.
- B. USE THE FOLLOWING RACEWAYS FOR OUTDOOR INSTALLATIONS:
  1. EXPOSED: IMC/RMC.
  2. CONCEALED: IMC/RMC.
  3. UNDERGROUND, BELOW SLAB: RNC - SCHEDULE 40 PVC.
  4. UNDERGROUND, ALL OTHER LOCATIONS: RNC - SCHEDULE 80 PVC.
  5. CONNECTION TO VIBRATING EQUIPMENT: LFMC.
  6. BOXES AND ENCLOSURES: NEMA 250, TYPE 3R OR TYPE 4.

3.04 RACEWAY AND CABLE INSTALLATION

- A. CONCEAL RACEWAYS AND CABLES, UNLESS OTHERWISE INDICATED, WITHIN FINISHED WALLS, CEILINGS, AND FLOORS.
- B. INSTALL RACEWAYS AND CABLES AT LEAST 6 INCHES (150 MM) AWAY FROM PARALLEL RUNS OF FLUES AND STEAM OR HOT-WATER PIPES. LOCATE HORIZONTAL RACEWAY RUNS ABOVE WATER AND STEAM PIPING.
- C. USE TEMPORARY RACEWAY CAPS TO PREVENT FOREIGN MATTER FROM ENTERING.
- D. MAKE CONDUIT BENDS AND OFFSETS SO ID IS NOT REDUCED, KEEP LEGS OF BENDS IN THE SAME PLANE AND STRAIGHT LEGS OF OFFSETS PARALLEL, UNLESS OTHERWISE INDICATED.
- E. USE RACEWAY AND CABLE FITTINGS COMPATIBLE WITH RACEWAYS AND CABLES AND SUITABLE FOR USE AND LOCATION.
- F. INSTALL RACEWAYS EMBEDDED IN SLABS IN MIDDLE THIRD OF SLAB THICKNESS WHERE PRACTICAL, AND LEAVE AT LEAST 1-INCH CONCRETE COVER. OBTAIN STRUCTURAL ENGINEER'S APPROVAL PRIOR TO INSTALLATION.
- 1. SECURE RACEWAYS TO REINFORCING RODS TO PREVENT GAGGING OR SHIFTING DURING CONCRETE PLACEMENT.
- 2. SPACE RACEWAYS LATERALLY TO PREVENT VOIDS IN CONCRETE.
- 3. INSTALL CONDUIT LARGER THAN 1-INCH TRADE SIZE (DN27) PARALLEL TO OR AT RIGHT ANGLES TO MAIN REINFORCEMENT. WHERE CONDUIT IS AT RIGHT ANGLES TO REINFORCEMENT, PLACE CONDUIT CLOSE TO SLAB SUPPORT.
- 4. TRANSITION FROM SCHEDULE 40 NONMETALLIC TUBING TO SCHEDULE 80 NONMETALLIC CONDUIT, RIGID STEEL CONDUIT, OR IMC BEFORE RISING ABOVE FLOOR.
- 5. MAKE BENDS IN EXPOSED PARALLEL OR BANKED RUNS FROM SAME CENTERLINE TO MAKE BENDS PARALLEL. USE FACTORY ELBOWS ONLY WHERE ELBOWS CAN BE INSTALLED PARALLEL; OTHERWISE, PROVIDE FIELD BENDS FOR EXPOSED PARALLEL RACEWAYS.
- G. INSTALL PULL WIRES IN EMPTY RACEWAYS. USE NO. 14 AWG ZINC-COATED STEEL OR MONOFILAMENT PLASTIC LINE WITH NOT LESS THAN 200-LB TENSILE STRENGTH. LEAVE AT LEAST 12 INCHES OF SLACK AT EACH END OF THE PULL WIRE.
- H. INSTALL TELEPHONE AND SIGNAL SYSTEM RACEWAYS, 2-INCH TRADE SIZE AND SMALLER, IN MAXIMUM LENGTHS OF 100 FEET AND WITH A MAXIMUM OF TWO 90-DEGREE BENDS OR EQUIVALENT. SEPARATE LENGTHS WITH PULL OR JUNCTION BOXES WHERE NECESSARY TO COMPLY WITH THESE REQUIREMENTS, IN ADDITION TO REQUIREMENTS ABOVE.
- I. CONNECT MOTORS AND EQUIPMENT SUBJECT TO VIBRATION, NOISE TRANSMISSION, OR MOVEMENT WITH A MAXIMUM OF 72-INCH (1830-MM) FLEXIBLE CONDUIT. INSTALL LFMC IN WET OR DAMP LOCATIONS. INSTALL SEPARATE GROUND CONDUCTOR ACROSS FLEXIBLE CONNECTIONS.
- J. SET FLOOR BOXES LEVEL AND TRIM AFTER INSTALLATION TO FIT FLUSH TO FINISHED FLOOR SURFACE.

3.05 WIRING METHODS FOR POWER, LIGHTING, AND CONTROL CIRCUITS

- A. FEEDERS: TYPE THHN/THWN INSULATED CONDUCTORS IN RACEWAY
- B. UNDERGROUND FEEDERS AND BRANCH CIRCUITS: TYPE XHHW OR SINGLE-WIRE, TYPE UF INSULATED CONDUCTORS IN RACEWAY.
- C. BRANCH CIRCUITS: TYPE THW OR THHN/THWN INSULATED CONDUCTORS IN RACEWAY WHERE EXPOSED. METAL-CLAD CABLE SHALL BE PERMITTED WHERE PERMITTED BY AUTHORITIES HAVING JURISDICTION. METAL-CLAD CABLE SHALL NOT BE INSTALLED WITHIN ELECTRIC CLOSETS OR DIRECTLY INTO PANELBOARDS. METAL-CLAD CABLE TO BE RESTRICTED TO ABOVE RECESSED CEILINGS, INSIDE WALLS, AND WITHIN 10FT OF EXPOSED LIGHTING FIXTURES.
- D. REMOTE-CONTROL SIGNALING AND POWER-LIMITED CIRCUITS: TYPE THHN/THWN INSULATED CONDUCTORS IN RACEWAY FOR CLASSES 1, 2, AND 3, UNLESS OTHERWISE INDICATED.
- E. MULTI-WIRE BRANCH CIRCUITS SHALL BE PROVIDED WITH A MEANS TO DISCONNECT SIMULTANEOUSLY ALL UNGROUNDED CONDUCTORS AT THE PANELBOARD WHERE THE BRANCH CIRCUIT ORIGINATES.

3.06 WIRING INSTALLATION

- A. ALL CONDUCTORS SHALL BE RUN IN CONDUIT. [SEE WIRE AND CABLE SECTION 3.06B FOR ALTERNATE PRICING TO UTILIZE MC CABLE WHERE PERMISSIBLE.]
- B. METAL CLAD (TYPE MC) FOR CONCEALED BRANCH CIRCUITRY IN OFFICE SPACES ONLY MAY BE USED WHEN APPROVED BY BUILDING MANAGEMENT AND WHERE PERMITTED BY CODE. RMC SHALL BE USED OUTSIDE OFFICE SPACES AND IN BUILDING CLOSETS. METAL CLAD (TYPE MC) SHALL NOT BE INSTALLED INTO PANELBOARDS.
- C. WIRE CONNECTORS AND SPLICES: UNITS OF SIZE, AMPACITY RATING, MATERIAL, TYPE, AND CLASS SUITABLE FOR SERVICE INDICATED.
- D. THE MINIMUM WIRE SIZE FOR BRANCH CIRCUITS SHALL BE NO. 12 AWG EXCEPT 120 VOLT CIRCUITS OVER 100' IN LENGTH SHALL BE NO. 10 AWG. CONTRACTOR SHALL PERFORM VOLTAGE DROP CALCULATIONS BASED ON FIELD CONDITIONS AND REPORT BACK TO THE ENGINEER ANY BRANCH CIRCUITS THAT REQUIRE TO BE UPSIZED TO ACCOMMODATE VOLTAGE DROP.
- E. THE TOTAL VOLTAGE DROP ACROSS THE COMBINATION OF FEEDERS AND BRANCH CIRCUITS SHALL NOT EXCEED 5 PERCENT PER THE ENERGY CONSERVATION CODE OF NEW YORK STATE SECTION C405.9.
- F. TAG ALL FEEDERS IN ALL PULL BOXES, GUTTER SPACES, AND WIREWAYS THROUGH WHICH THEY PASS.
- G. TERMINATE STRANDED CONDUCTORS NO. 8 AWG AND LARGER, AT SWITCHBOARDS, TRANSFORMERS, UPS SYSTEMS WITH COMPRESSION TYPE CONNECTORS. TERMINATE WITH MECHANICAL LUGS AT PANELBOARDS.
- H. JOIN OR TAP STRANDED CONDUCTORS (NO. 6 AWG AND LARGER) WITH PRESSURE INDENT TYPE CONNECTORS BURNDY, NEPCO, OR O.Z./GEDNEY WITH COMPOSITION INSULATING COVERS.
- I. SPLICES IN BRANCH WIRING (NO. 8 AWG AND SMALLER) SHALL BE TWISTED AND MADE MECHANICALLY TIGHT; THEN SECURED WITH PITGAIL CONNECTORS, CRIMP TYPE CONNECTORS SHALL NOT BE USED. UTILIZE UL LISTED, "SILICON FILLED" PITGAIL CONNECTORS WHERE LOCATED IN WET ENVIRONMENTS OR OUTDOORS.
- J. SUPPORT CONDUCTORS IN VERTICAL RACEWAYS IN ACCORDANCE WITH THE NEC BASED ON CONDUCTOR SIZE AND VERTICAL DISTANCE.
- K. WALL MOUNTED DEVICES SHALL BE FED VERTICALLY. HORIZONTAL RUNS THROUGH PARTITIONS SHALL NOT BE

PERMITTED, EXCEPT IN LOW HEIGHT PARTITIONS OR WHERE NOTED ON DRAWINGS

- L. CONNECT OUTLET AND COMPONENT CONNECTIONS TO WIRING SYSTEMS AND TO GROUND. 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 486A.
- M. FOR ALL SIZES OF CONDUIT LARGER THAN 1-1/2", USE STANDARD ELBOW.
- N. CONDUIT SHALL BE SECURELY FASTENED IN PLACE AND HANGERS, SUPPORTS OR FASTENINGS SHALL BE PROVIDED AT EACH ELBOW AND AT EACH END OF EACH STRAIGHT RUN TERMINATED AT A BOX OR CABINET.
- O. PROVIDE EXPANSION FITTINGS IN EACH CONDUIT RUN WHEREVER IT CROSSES AN EXPANSION JOINT AND WHEREVER THE CONDUIT LENGTH EXCEEDS 200 FEET WITH A CHANGE IN DIRECTION.
- P. UNLESS OTHERWISE INDICATED OR SPECIFIED, ALL WIRING SHALL BE INSTALLED CONCEALED.
- Q. FEEDERS AND BRANCH CIRCUITRY ABOVE HUNG CEILING AND IN PARTITIONS SHALL BE RUN IN ELECTRICAL METALLIC TUBING (EMT) UNLESS OTHERWISE NOTED. FINAL CONNECTIONS TO MOTORS, LIGHT FIXTURES, TRANSFORMERS, AND EQUIPMENT SUBJECT TO VIBRATION WILL BE DONE WITH FLEXIBLE METALLIC CONDUIT (GREENFIELD), LENGTH SHALL NOT EXCEED 6 FEET.
- R. ALL CONDUIT IN MECHANICAL ROOMS, ELECTRICAL CLOSETS AND WHERE CONCEALED IN CONCRETE OR INSTALLED OUTDOORS SHALL BE RIGID THREADED REGARDLESS OF SIZE.
- S. ALL CONDUITS INSTALLED IN CONCRETE OR OUTDOORS SHALL BE PROVIDED WITH WEATHER-PROOF CONNECTORS.
- T. ALL METAL CONDUIT TERMINATING IN A METAL ENCLOSURE SHALL HAVE AN INSULATED BUSHING. PROVIDE "GROUNDING" TYPE BUSHING WHERE REQUIRED.
- U. INSTALL CONDUITS TO CONSERVE HEADROOM, PARALLEL AND PERPENDICULAR TO BUILDING LINES. DO NOT CLIP CONDUITS TO CEILING HANGER
- V. WALL COMMUNICATIONS CONDUIT SHALL BE REAMED AND INSTALLED COMPLETE WITH INSULATED BUSHINGS AT EACH END.

3.07 ELECTRICAL SUPPORTING DEVICE APPLICATION

- A. DAMP LOCATIONS AND OUTDOORS: HOT-DIP GALVANIZED MATERIALS OR NONMETALLIC, U-CHANNEL SYSTEM COMPONENTS.
- B. DRY LOCATIONS: STEEL MATERIALS.
- C. SUPPORT CLAMPS FOR PVC RACEWAYS: CLICK-TYPE CLAMP SYSTEM.
- D. SELECTION OF SUPPORTS: COMPLY WITH MANUFACTURER'S WRITTEN INSTRUCTIONS.
- E. STRENGTH OF SUPPORTS: ADEQUATE TO CARRY PRESENT AND FUTURE LOADS, TIMES A SAFETY FACTOR OF AT LEAST FOUR; MINIMUM OF 200-LB (90-KG) DESIGN LOAD.

3.08 SUPPORT INSTALLATION

- A. INSTALL SUPPORT DEVICES TO SECURELY AND PERMANENTLY FASTEN AND SUPPORT ELECTRICAL COMPONENTS.
- B. INSTALL INDIVIDUAL AND MULTIPLE RACEWAY HANGERS AND RISER CLAMPS TO SUPPORT RACEWAYS. PROVIDE U-BOLTS, CLAMPS, ATTACHMENTS, AND OTHER HARDWARE NECESSARY FOR HANGER ASSEMBLIES AND FOR SECURING HANGER RODS AND CONDUITS.
- C. SUPPORT PARALLEL RUNS OF HORIZONTAL RACEWAYS TOGETHER ON TRAPEZE- OR BRACKET-TYPE HANGERS.
- D. SIZE SUPPORTS FOR MULTIPLE RACEWAY INSTALLATIONS SO CAPACITY CAN BE INCREASED BY A 25 PERCENT MINIMUM IN THE FUTURE.
- E. SUPPORT INDIVIDUAL HORIZONTAL RACEWAYS WITH SEPARATE, MALLEABLE-IRON PIPE HANGERS OR CLAMPS.
- F. INSTALL 1/4-INCH- (6-MM-) DIAMETER OR LARGER THREADED STEEL HANGER RODS, UNLESS OTHERWISE INDICATED.
- G. SPRING-STEEL FASTENERS SPECIFICALLY DESIGNED FOR SUPPORTING SINGLE CONDUITS OR TUBING MAY BE USED INSTEAD OF MALLEABLE-IRON HANGERS FOR 1-1/2-INCH (38-MM) AND SMALLER RACEWAYS SERVING LIGHTING AND RECEPTACLE BRANCH CIRCUITS ABOVE SUSPENDED CEILINGS AND FOR FASTENING RACEWAYS TO SLOTTED CHANNEL AND ANGLE SUPPORTS.
- H. ARRANGE SUPPORTS IN VERTICAL RUNS SO THE WEIGHT OF RACEWAYS AND ENCLOSED CONDUCTORS IS CARRIED ENTIRELY BY RACEWAY SUPPORTS, WITH NO WEIGHT LOAD ON RACEWAY TERMINALS.
- I. SIMULTANEOUSLY INSTALL VERTICAL CONDUCTOR SUPPORTS WITH CONDUCTORS.
- J. SEPARATELY SUPPORT CAST BOXES THAT ARE THREADED TO RACEWAYS AND USED FOR FIXTURE SUPPORT. SUPPORT SHEET-METAL BOXES DIRECTLY FROM THE BUILDING STRUCTURE OR BY BAR HANGERS. IF BAR HANGERS ARE USED, ATTACH BAR TO RACEWAYS ON OPPOSITE SIDES OF THE BOX AND SUPPORT THE RACEWAY WITH AN APPROVED FASTENER NOT MORE THAN 12 INCHES FROM THE BOX.
- K. INSTALL METAL CHANNEL RACKS FOR MOUNTING CABINETS, PANELBOARDS, DISCONNECT SWITCHES, CONTROL ENCLOSURES, PULL AND JUNCTION BOXES, TRANSFORMERS, AND OTHER DEVICES UNLESS COMPONENTS ARE MOUNTED DIRECTLY TO STRUCTURAL ELEMENTS OF ADEQUATE STRENGTH.
- L. INSTALL SLEEVES FOR CABLE AND RACEWAY PENETRATIONS OF CONCRETE SLABS AND WALLS UNLESS CORE-DRILLED HOLES ARE USED. INSTALL SLEEVES FOR CABLE AND RACEWAY PENETRATIONS OF MASONRY AND FIRE-RATED GYPSUM WALLS AND OF ALL OTHER FIRE-RATED FLOOR AND WALL ASSEMBLIES. INSTALL SLEEVES DURING ERECTION OF CONCRETE AND MASONRY WALLS.
- M. SECURELY FASTEN ELECTRICAL ITEMS AND THEIR SUPPORTS TO THE BUILDING STRUCTURE, UNLESS OTHERWISE INDICATED. PERFORM FASTENING ACCORDING TO THE FOLLOWING UNLESS OTHER FASTENING METHODS ARE INDICATED:

- 1. WOOD: FASTEN WITH WOOD SCREWS OR SCREW-TYPE NAILS.
- 2. MASONRY: TOGGLE BOLTS ON HOLLOW MASONRY UNITS AND EXPANSION BOLTS ON SOLID MASONRY UNITS.
- 3. NEW CONCRETE: CONCRETE INSERTS WITH MACHINE SCREWS AND BOLTS.
- 4. EXISTING CONCRETE: EXPANSION BOLTS.
- 5. INSTEAD OF EXPANSION BOLTS, THREADED STUDS DRIVEN BY A POWDER CHARGE AND PROVIDED WITH LOCK WASHERS MAY BE

USED IN EXISTING CONCRETE.

- 6. STEEL: WELDED THREADED STUDS OR SPRING-TENSION CLAMPS ON STEEL.
  - a. FIELD WELDING: COMPLY WITH AWS D1.1.
- 7. WELDING TO STEEL STRUCTURE MAY BE USED ONLY FOR THREADED STUDS, NOT FOR CONDUITS, PIPE STRAPS, OR OTHER ITEMS.
- 8. LIGHT STEEL: SHEET-METAL SCREWS.
- 9. FASTENERS: SELECT SO THE LOAD APPLIED TO EACH FASTENER DOES NOT EXCEED 25 PERCENT OF ITS PROOF-TEST LOAD.
- 10. NO TAPCON TYPE SELF THREADING SCREWS SHALL BE ALLOWED INTO MASONRY OR CONCRETE.

3.09 IDENTIFICATION MATERIALS AND DEVICES

- A. INSTALL AT LOCATIONS FOR MOST CONVENIENT VIEWING WITHOUT INTERFERENCE WITH OPERATION AND MAINTENANCE OF EQUIPMENT.
- B. COORDINATE NAMES, ABBREVIATIONS, COLORS, AND OTHER DESIGNATIONS USED FOR ELECTRICAL IDENTIFICATION WITH CORRESPONDING DESIGNATIONS INDICATED IN THE CONTRACT DOCUMENTS OR REQUIRED BY CODES AND STANDARDS. USE CONSISTENT DESIGNATIONS THROUGHOUT PROJECT.
- C. SELF-ADHESIVE IDENTIFICATION PRODUCTS: CLEAN SURFACES BEFORE APPLYING.
- D. IDENTIFY RACEWAYS AND CABLES WITH COLOR BANDING AS FOLLOWS:
  1. BANDS: PRETENSIONED, SNAP-AROUND, COLORED PLASTIC SLEEVES OR COLORED ADHESIVE MARKING TAPE. MAKE EACH COLOR BAND 2 INCHES (51 MM) WIDE, COMPLETELY ENCIRCLING CONDUIT, AND PLACE ADJACENT BANDS OF TWO-COLOR MARKINGS IN CONTACT, SIDE BY SIDE.
  2. BAND LOCATIONS: AT CHANGES IN DIRECTION, AT PENETRATIONS OF WALLS AND FLOORS, AT 50-FOOT (15-M) MAXIMUM INTERVALS IN STRAIGHT RUNS, AND AT 25-FOOT (8-M) MAXIMUM INTERVALS IN CONGESTED AREAS.
  3. COLORS: AS FOLLOWS:
    - a. FIRE ALARM SYSTEM: RED.
    - b. SECURITY SYSTEM: BLUE AND YELLOW.
    - c. TELECOMMUNICATION SYSTEM: GREEN AND YELLOW.
- E. TAG AND LABEL CIRCUITS DESIGNATED TO BE EXTENDED IN THE FUTURE. IDENTIFY SOURCE AND CIRCUIT NUMBERS IN EACH CABINET, PULL AND JUNCTION BOX, AND OUTLET BOX. COLOR-CODING MAY BE USED FOR VOLTAGE AND PHASE IDENTIFICATION.
- F. INSTALL CONTINUOUS UNDERGROUND PLASTIC MARKERS DURING TRENCH BACKFILLING, FOR EXTERIOR UNDERGROUND POWER, CONTROL, SIGNAL, AND COMMUNICATION LINES LOCATED DIRECTLY ABOVE POWER AND COMMUNICATION LINES. LOCATE 6 TO 8 INCHES BELOW FINISHED GRADE. IF WIDTH OF MULTIPLE LINES INSTALLED IN A COMMON TRENCH OR CONCRETE ENVELOPE DOES NOT EXCEED 16 INCHES, OVERALL, USE A SINGLE LINE MARKER.
- G. COLOR-CODE 208/120-V SYSTEM SECONDARY SERVICE, FEEDER, AND BRANCH-CIRCUIT CONDUCTORS THROUGHOUT THE SECONDARY ELECTRICAL SYSTEM SHALL BE SIMILAR TO (MATCHING BUILDING STANDARDS):
  1. PHASE A: BLACK.
  2. PHASE B: RED.
  3. PHASE C: BLUE.
  4. NEUTRAL: WHITE
  5. GROUND: GREEN
  - H. COLOR-CODE 480/277-V SYSTEM SECONDARY SERVICE, FEEDER, AND BRANCH-CIRCUIT CONDUCTORS THROUGHOUT THE SECONDARY ELECTRICAL SYSTEM SHALL BE SIMILAR TO (MATCHING BUILDING STANDARDS):
    1. PHASE A: YELLOW.
    2. PHASE B: BROWN.
    3. PHASE C: ORANGE.
    4. NEUTRAL: GRAY OR WHITE WITH A COLORED STRIPE (NOT GREEN).
    5. GROUND: GREEN

- I. INSTALL WARNING, CAUTION, AND INSTRUCTION SIGNS WHERE REQUIRED TO COMPLY WITH 29 CFR, CHAPTER XVII, PART 1910.145, AND WHERE NEEDED TO ENSURE SAFE OPERATION AND MAINTENANCE OF ELECTRICAL SYSTEMS AND OF ITEMS TO WHICH THEY CONNECT. INSTALL ENGRAVED PLASTIC-LAMINATED INSTRUCTION SIGNS WITH APPROVED LEGEND WHERE INSTRUCTIONS ARE NEEDED FOR SYSTEM OR EQUIPMENT OPERATION. INSTALL METAL-BACKED BUTYRATE SIGNS FOR OUTDOOR ITEMS.
- J. INSTALL ENGRAVED-LAMINATED EMERGENCY-OPERATING SIGNS WITH WHITE LETTERS ON RED BACKGROUND WITH MINIMUM 3/8-INCH- (9-MM-) HIGH LETTERING FOR EMERGENCY INSTRUCTIONS ON POWER TRANSFER, LOAD SHEDDING, AND OTHER EMERGENCY OPERATIONS.
- K. INSTALL PRE-PRINTED LABEL MAXIMUM 6" FROM TERMINATION OF ALL WIRE, LISTING PHASE, PANEL, AND CIRCUIT NUMBER.

- 3.10 UTILITY COMPANY ELECTRICITY-METERING EQUIPMENT
- A. INSTALL EQUIPMENT ACCORDING TO UTILITY COMPANY'S WRITTEN REQUIREMENTS. PROVIDE GROUNDING AND EMPTY CONDUITS AS REQUIRED BY UTILITY COMPANY.

- 3.11 FIRESTOPPING
  - A. APPLY FIRESTOPPING TO CABLE AND RACEWAY PENETRATIONS OF FIRE-RATED FLOOR AND WALL ASSEMBLIES TO ACHIEVE FIRE-RESISTANCE RATING OF THE ASSEMBLY. FIRESTOPPING MATERIALS AND INSTALLATION REQUIREMENTS ARE SPECIFIED IN DIVISION 7 SECTION "FIRESTOPPING."

- 3.12 CONCRETE BASES
  - A. CONSTRUCT CONCRETE BASES OF DIMENSIONS INDICATED, BUT NOT LESS THAN 4 INCHES (100 MM) LARGER, IN BOTH DIRECTIONS, THAN SUPPORTED UNIT. FOLLOW SUPPORTED EQUIPMENT MANUFACTURER'S ANCHORAGE RECOMMENDATIONS

3.13 SURGE PROTECTION DEVICES

- A. INSTALL SPD'S WITH CONDUCTORS BETWEEN SUPPRESSOR AND POINTS OF ATTACHMENT AS SHORT AND STRAIGHT AS POSSIBLE. AND ADJUST CIRCUIT-BREAKER POSITIONS TO ACHIEVE SHORTEST AND STRAIGHTEST LEADS. DO NOT SPLICE AND EXTEND SPD LEADS UNLESS SPECIFICALLY PERMITTED BY MANUFACTURER. DO NOT EXCEED MANUFACTURER'S LEAD LENGTH.

3.14 DEMOLITION

- A. REFER TO DEMOLITION CONSTRUCTION DRAWING PACKAGE DATED 05/11/2021 FOR DEMOLITION SCOPE OF WORK.

3.15 CUTTING AND PATCHING

- A. CUT, CHANNEL, CHASE, AND DRILL FLOORS, WALLS, PARTITIONS, CEILINGS, AND OTHER SURFACE REQUIRED TO PERMIT ELECTRICAL INSTALLATIONS. PERFORM CUTTING BY SKILLED MECHANICS OF TRADES INVOLVED.
- B. REPAIR AND REFINISH DISTURBED FINISH MATERIALS AND OTHER SURFACES TO MATCH ADJACENT UNDISTURBED SURFACES. INSTALL NEW FIREPROOFING WHERE EXISTING FIRESTOPPING HAS BEEN DISTURBED. REPAIR AND REFINISH MATERIALS AND OTHER SURFACES BY SKILLED MECHANICS OF TRADES INVOLVED.

3.16 REFINISHING AND TOUCHUP PAINTING

- A. REFINISH AND TOUCH UP PAINT. PAINT MATERIALS AND APPLICATION REQUIREMENTS ARE SPECIFIED A SEPARATE DIVISION OF THE SPECIFICATIONS
- 1. CLEAN DAMAGED AND DISTURBED AREAS AND APPLY PRIMER, INTERMEDIATE, AND FINISH COATS TO SUIT THE DEGREE OF DAMAGE AT EACH LOCATION.
- 2. FOLLOW PAINT MANUFACTURER'S WRITTEN INSTRUCTIONS FOR SURFACE PREPARATION AND FOR TIMING AND APPLICATION OF SUCCESSIVE COATS.
- 3. REPAIR DAMAGE TO GALVANIZED FINISHES WITH ZINC-RICH PAINT RECOMMENDED BY MANUFACTURER.
- 4. REPAIR DAMAGE TO PVC OR PAINT FINISHES WITH MATCHING TOUCHUP COATING RECOMMENDED BY MANUFACTURER.

3.17 CLEANING AND PROTECTION

- A. ON COMPLETION OF INSTALLATION, INCLUDING OUTLETS, FITTINGS, AND DEVICES, INSPECT EXPOSED FINISH. REMOVE BURRS, DIRT, PAINT SPOTS, AND CONSTRUCTION DEBRIS.
- B. PROTECT EQUIPMENT AND INSTALLATIONS AND MAINTAIN CONDITIONS TO ENSURE THAT COATINGS, FINISHES, AND CABINETS ARE WITHOUT DAMAGE OR DETERIORATION AT TIME OF SUBSTANTIAL COMPLETION.

AND SETTING TEMPLATES FOR ANCHOR-BOLT AND TIE LOCATIONS, UNLESS OTHERWISE INDICATED. USE 3000-PSI (20.7-MPA), 28-DAY COMPRESSIVE-STRENGTH CONCRETE AND REINFORCEMENT AS SPECIFIED A SEPARATE DIVISION OF THE SPECIFICATIONS.

B. INSTALL ALL TRANSFORMERS ON CONCRETE PADS.

3.13 SURGE PROTECTION DEVICES

- A. INSTALL SPD'S WITH CONDUCTORS BETWEEN SUPPRESSOR AND POINTS OF ATTACHMENT AS SHORT AND STRAIGHT AS POSSIBLE. AND ADJUST CIRCUIT-BREAKER POSITIONS TO ACHIEVE SHORTEST AND STRAIGHTEST LEADS. DO NOT SPLICE AND EXTEND SPD LEADS UNLESS SPECIFICALLY PERMITTED BY MANUFACTURER. DO NOT EXCEED MANUFACTURER'S LEAD LENGTH.

3.14 DEMOLITION

- A. REFER TO DEMOLITION CONSTRUCTION DRAWING PACKAGE DATED 05/11/2021 FOR DEMOLITION SCOPE OF WORK.

3.15 CUTTING AND PATCHING

- A. CUT, CHANNEL, CHASE, AND DRILL FLOORS, WALLS, PARTITIONS, CEILINGS, AND OTHER SURFACE REQUIRED TO PERMIT ELECTRICAL INSTALLATIONS. PERFORM CUTTING BY SKILLED MECHANICS OF TRADES INVOLVED.
- B. REPAIR AND REFINISH DISTURBED FINISH MATERIALS AND OTHER SURFACES TO MATCH ADJACENT UNDISTURBED SURFACES. INSTALL NEW FIREPROOFING WHERE EXISTING FIRESTOPPING HAS BEEN DISTURBED. REPAIR AND REFINISH MATERIALS AND OTHER SURFACES BY SKILLED MECHANICS OF TRADES INVOLVED.

3.16 REFINISHING AND TOUCHUP PAINTING

- A. REFINISH AND TOUCH UP PAINT. PAINT MATERIALS AND APPLICATION REQUIREMENTS ARE SPECIFIED A SEPARATE DIVISION OF THE SPECIFICATIONS
- 1. CLEAN DAMAGED AND DISTURBED AREAS AND APPLY PRIMER, INTERMEDIATE, AND FINISH COATS TO SUIT THE DEGREE OF DAMAGE AT EACH LOCATION.
- 2. FOLLOW PAINT MANUFACTURER'S WRITTEN INSTRUCTIONS FOR SURFACE PREPARATION AND FOR TIMING AND APPLICATION OF SUCCESSIVE COATS.
- 3. REPAIR DAMAGE TO GALVANIZED FINISHES WITH ZINC-RICH PAINT RECOMMENDED BY MANUFACTURER.
- 4. REPAIR DAMAGE TO PVC OR PAINT FINISHES WITH MATCHING TOUCHUP COATING RECOMMENDED BY MANUFACTURER.

3.17 CLEANING AND PROTECTION

- A. ON COMPLETION OF INSTALLATION, INCLUDING OUTLETS, FITTINGS, AND DEVICES, INSPECT EXPOSED FINISH. REMOVE BURRS, DIRT, PAINT SPOTS, AND CONSTRUCTION DEBRIS.
- B. PROTECT EQUIPMENT AND INSTALLATIONS AND MAINTAIN CONDITIONS TO ENSURE THAT COATINGS, FINISHES, AND CABINETS ARE WITHOUT DAMAGE OR DETERIORATION AT TIME OF SUBSTANTIAL COMPLETION.

3.18 IDENTIFICATION OF EQUIPMENT

- A. ALL PANELBOARDS, CONTROL PANELS, AND CABINETS SPECIFIED HEREIN SHALL BE CLEARLY IDENTIFIED WITH THE EQUIPMENT DESIGNATION AND VOLTAGE RATING. IDENTIFICATION SHALL BE BY WHITE ON BLACK PLASTIC NAMEPLATE WITH 1/2" MINIMUM LETTERING ATTACHED BY SCREWS.
- B. ALL PANELBOARDS, SPECIFIED HEREIN SHALL BE PROVIDED WITH A MEANS OF IDENTIFICATION OF THE MULTI-WIRE BRANCH CIRCUIT COLOR CODE IDENTIFICATION SYSTEM INSTALLED PER THE REQUIREMENTS OF NEC ARTICLE 210.5. REFER TO SPECIFICATION SECTION 2.03.E FOR COLOR CODING DESIGNATIONS.
- C. JUNCTION BOXES, SPLICE BOXES, ETC. SHALL BE IDENTIFIED WITH PANEL AND CIRCUIT NUMBERS, FOR CIRCUITS CONTAINED THEREIN. FACEPLATE OF SWITCHES FOR EQUIPMENT SUCH AS MOTORIZED SCREENS, ETC., SHALL BE IDENTIFIED WITH THE NAME OF THE DEVICE CONTROLLED. IDENTIFICATION SHALL BE BY INDELIBLE MARKER IN CONCEALED LOCATIONS AND ADHESIVE ("P" TOUCH TYPE) LABELS IN EXPOSED LOCATIONS. EMERGENCY DEVICES SHALL BE IDENTIFIED IN RED.
- D. CLEARLY LABEL ALL EXPOSED CONDUIT, PULL BOXES, JUNCTION BOXES, ETC TO INDICATE THE NATURE OF THE SERVICE.
- E. EMPTY CONDUITS SHALL BE IDENTIFIED WITH TAGS AT BOTH ENDS INDICATING THE LOCATION OF TERMINATION OF THE OPPOSITE END.
- F. FIRE ALARM SYSTEM JUNCTION BOXES SHALL BE PAINTED FIRE DEPARTMENT RED. APPROVED IDENTIFICATION CARDS SHALL BE FURNISHED ADJACENT TO ALL CONTROL PANELS AND MANUAL STATIONS.
- G. ALL RECEPTACLES SHALL HAVE CIRCUIT NUMBERS AND ASSOCIATED PANEL DESIGNATION CLEARLY IDENTIFIED ON THE RECEPTACLES (OR DISCONNECT JUNCTION BOX, ETC...) FACEPLATE. IDENTIFICATION SHALL BE PERMANENT, INDELIBLE AND TYPEWRITTEN.
- H. PROVIDE SCREW-FASTENED TYPEWRITTEN ENGRAVED LAMICOID NAMEPLATE WITH MINIMUM 1/4" HIGH WHITE LETTERING ON BLACK BACKGROUND, CLEARLY INDICATING THE FUNCTION, DESIGNATION OR EQUIPMENT CONTROLLED FOR EACH OF THE FOLLOWING:
  1. ALL PANEL AND SWITCH BOARDS
  2. MOTOR STARTERS AND MISCELLANEOUS CONTROL SWITCHES
  3. DISCONNECT SWITCHES
  4. ENCLOSED CIRCUIT BREAKERS
  5. CONTACTORS AND RELAYS
  6. CONTROL SWITCHES
  7. TRANSFORMERS
  8. AUTOMATIC TRANSFER SWITCHES
  9. LIGHTING CONTROL RELAY PANELS
  10. JUNCTION BOXES

- 1. ALL PANEL AND SWITCH BOARDS
- 2. MOTOR STARTERS AND MISCELLANEOUS CONTROL SWITCHES
- 3. DISCONNECT SWITCHES
- 4. ENCLOSED CIRCUIT BREAKERS
- 5. CONTACTORS AND RELAYS
- 6. CONTROL SWITCHES
- 7. TRANSFORMERS
- 8. AUTOMATIC TRANSFER SWITCHES
- 9. LIGHTING CONTROL RELAY PANELS
- 10. JUNCTION BOXES
- 1. PROVIDE NAMEPLATES FOR ALL NEW AND EXISTING EQUIPMENT

TO THE BEST KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE.

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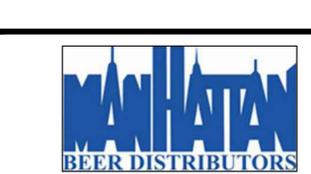
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KEY PLAN

REV	DESCRIPTION	DATE
	ISSUED FOR DOB SUBMISSION	09/10/2021
	ISSUED FOR BID	10/15/2021
	ISSUED FOR PROGRESS	01/18/2022
	ISSUED FOR BID	08/30/2022

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