LOW VOLTAGE CONDUIT SYSTEMS

1. PROVIDE ALL CONDUIT WIREWAYS, JUNCTION BOXES, PULL BOXES, WORK BOXES, CABLE TRAY, CIRCUIT BREAKERS AND POWER WIRING FOR LOW VOLTAGE SYSTEMS INDICATED ON THE DRAWINGS AND AS SPECIFIED HEREIN, INCLUDING AS NECESSARY FOR THE PROPER AND COMPLETE PERFORMANCE OF THE WORK. LOW VOLTAGE SYSTEMS INCLUDE, BUT ARE NOT LIMITED TO:
   a. TELEPHONE AND DATA SYSTEMS
   b. AUDIO / VISUAL SYSTEM
   c. SECURITY CONDUIT SYSTEMS

2. EXAMINATION:
   a. EXAMINE THE AREAS AND CONDITIONS UNDER WHICH THE LOW VOLTAGE SYSTEM ARE TO BE INSTALLED AND NOTIFY ENGINEER IN WRITING OF CONDITIONS DETRIMENTAL TO THE PROPER AND TIMELY COMPLETION OF WORK.
   b. EXAMINE LOW VOLTAGE SYSTEM DOCUMENTS PROVIDED UNDER OTHER SECTIONS FOR RACEWAY SIZES, ROUTING AND LOCATION OF DEVICES.

3. COORDINATION:
   a. PROVIDE FOR A PRE-CONSTRUCTION MEETING WITH REPRESENTATIVES OF RELATED DISCIPLINES TO REVIEW INSTALLATION OF SYSTEM. THIS MEETING IS TO HELP RELATED TRADES UNDERSTAND THE REQUIREMENTS OF THE INSTALLATION.
   b. OBTAIN FINAL ROUGHING DIMENSIONS AND OTHER INFORMATION AS NEEDED TO PROPERLY LOCATE THE DEVICE.
   c. KEEP FULLY INFORMED ABOUT SHAPE SIZE AND POSITION OF OPENINGS REQUIRED FOR MATERIAL AND EQUIPMENT.
   d. PROVIDE FOR COORDINATION MEETINGS WITH THE CABLE INSTALLER TO SCHEDULE WHEN THE CONDUIT SYSTEM CAN BE UTILIZED FOR CABLE PULLING.

4. INSTALLATION:
   a. INSTALL RACEWAYS, BOXES AND CABLE TRAY WHERE INDICATED, IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS, GUIDELINES AND THE APPLICABLE REQUIREMENTS OF THE NEC, LOCAL CODES, THE NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION'S "STANDARD OF INSTALLATION" AND IN ACCORDANCE WITH RECOGNIZED INDUSTRY PRACTICES TO ENSURE THAT PRODUCTS SERVE THE INTENDED FUNCTION.
   b. REFER TO THE LATEST EDITION OF THE EIA/TIA STANDARDS FOR ADDITIONAL INSTALLATION REQUIREMENTS.
   c. BOXES SHALL BE SET FLUSH WITH FINISHED WALL SURFACE. PROVIDE PLASTER REDUCER RINGS AS REQUIRED. USE GANGED BOXES FOR OUTLETS HAVING THREE OR MORE CONDUITS ENTERING.
   d. BACKBONE AND MAJOR RACEWAY GROUPINGS (MULTIPLE 4" OR 5" CONDUITS) SHALL HAVE PULL BOXES SPACED NOT GREATER THAN 100 FEET APART AND IN RUNS WITH MORE THAN TWO RIGHT ANGLE BENDS.
   e. PROVIDE NYLON PULL-IN WIRE IN CONDUITS FOR USE BY CABLE INSTALLER. PULL WIRE SHALL BE LABELED AT BOTH ENDS.
   f. PROVIDE POWER REQUIREMENTS SUCH AS DUPLEX OUTLETS AND GROUND TERMINAL CONNECTIONS, AS SHOWN ON DRAWINGS.
   g. PROVIDE LABEL ON PULL AND JUNCTION BOXES FOR ALL SYSTEMS.
   h. CONDUIT AND CABLE TRAY FOR TELECOMMUNICATIONS WIRING SHALL BE INSTALLED TO MAINTAIN A MINIMUM OF 5" SEPARATION FROM FLUORESCENT LIGHTING FIXTURES.
   i. CABLE TRAY:
      1) BOND ALL EMPTY CONDUITS TO THE CABLE TRAY SYSTEM WITH A #12 AWG COPPER INSULATED CONDUCTOR.
      2) PROVIDE 4" CONDUIT SLEEVES THROUGH RATED WALLS.
   j. WHERE TELECOM DRAWINGS PROVIDES FUTURE PROVISIONS FOR TELECOMMUNICATION AT FLOOR BOXES AND POKE THRU'S ELECTRICAL CONTRACTOR SHALL PROVIDE A 1" CONDUIT WITH PULL STRING TO TEL/DATA ROOM.
   k. PROVIDE A DOUBLE GANG OUTLET BOX AND SINGLE GANG PLASTER RING FOR TELECOMMUNICATION. WHEN MOUNTING THE OUTLET BOX IN A STEEL STUDDED WALL, USE A BACK BRACE.
   l. MINIMUM SIZE BOX SHALL BE 4-11/16" SQUARE, 2-1/8" DEEP WITH SINGLE OR DOUBLE GANG PLASTER RING AS APPLICABLE.
   m. CONDUITS FEEDING DATA/TELECOM LOCATIONS MUST BE 1" AND MUST BE BONDED TO CABLE TRY IN ADDITION TO THE BUSHING AND PULL STRING. A BONDABLE BUSHING MAY BE USED.
   n. ALL CONDUCTIVE MATERIALS INCLUDING CONDUIT, WALL BOXES, CABLE TRAY, SLEEVES, ETC MUST BE BONDED TOGETHER TO ENSURE A PROPER GROUNDING PATH IN ACCORDANCE WITH NEC ARTICLES 250.92 AND 392.6.

5. APPLICATION:
   a. GENERALLY RACEWAYS SHALL BE EMT AND RUN CONCEALED IN WALLS AND ABOVE CEILINGS. EMT SHALL BE USED IN CEILING AIR PLENUM AND AS SHOWN ON DRAWINGS.
   b. RACEWAY FOR WALL BOXES SHALL BE INSTALLED IN CONDUIT TO AUDIO VISUAL ROOM OR TELECOMMUNICATIONS CLOSET.
   c. RACEWAYS FOR FLOOR BOXES SHALL BE INSTALLED IN CONDUIT TO TO AUDIO VISUAL ROOM OR TELECOMMUNICATIONS CLOSET.
   d. CONDUIT RUNS SHALL BE AS INDICATED ON DRAWINGS BUT NO SMALLER THAN 1". PROVIDE INSULATED GROUND BUSHING AT END OF EACH CONDUIT RUN.

264400 PANELBOARDS

PART 1 - GENERAL

1. PROVIDE UL-LISTED SAFETY DEAD-FRONT POWER PANELBOARDS WHERE SHOWN ON DRAWINGS AND AS SCHEDULED. PANELBOARDS SHALL MEET OR EXCEED REQUIREMENTS OF NEMA STANDARD PUBLICATION PB-1 AND UL-50 AND 67. PROVIDE CABINETS WITH FLUSH HINGES AND COMBINATION CATCH AND LOCK. PROVIDE WIRING GUTTERS TO ACCOMMODATE LARGE MULTIPLIER FEEDER CABLES AND LUGS. EXCEPT AS SHOWN OTHERWISE ON DRAWINGS, WIRING GUTTERS SHALL BE AT LEAST 4".
2. PANELBOARDS SHALL BE BY SQUARE D TO MATCH THE EXISTING.
3. PANELBOARDS SHALL HAVE INTEGRATED SHORT CIRCUIT CURRENT RATING EQUAL TO OR GREATER THAN CIRCUIT BREAKER AIC RATINGS SHOWN ON DRAWINGS.
4. MAIN BUS BARS SHALL BE COPPER, SIZED AS REQUIRED BY UL STANDARDS.
5. PROVIDE MOLDED CASE, BOLT-ON, THERMAL-MAGNETIC TRIP, SINGLE, TWO OR THREE POLE BRANCH CIRCUIT BREAKERS AS SHOWN ON DRAWINGS. MULTIPLE POLE BREAKERS SHALL BE SINGLE HANDLE, COMMON TRIP. CIRCUIT BREAKERS SHALL BE LISTED AND LABELED FOR 75° CONDUCTOR AMPACITIES.
6. PROVIDE BUS CONNECTIONS FOR FUTURE OVER CURRENT DEVICE WITH SUITABLE INSULATION AND BRACING TO MAINTAIN PROPER SHORT CIRCUIT RATING AND VOLTAGE CLEARANCES, WHERE REQUIRED ON DRAWINGS. PROVIDE FOR READY INSERTION OF FUTURE BREAKER.
7. PROVIDE SEPARATE EQUIPMENT GROUND BUS FOR EACH PANELBOARD.
8. PANELS SHALL HAVE HEAVY DUTY, CONTINUOUS, SECTION VERTICAL-HINGING TO BOX SECTION FOR ACCESS TO WIRING GUTTERS IN ADDITION TO TRIM DOOR (DOOR IN DOOR TYPE). OPENING INNER DOOR SHALL EXPOSE CIRCUIT BREAKER OPERATOR HANDLES AND PANELBOARD DIRECTORY. OPENING OUTER DOOR SHALL EXPOSE TERMINALS AND CIRCUIT BREAKERS IN A SINGLE OPERATION.
9. PROVIDE 1/2" SPACERS FOR PANELBOARDS MOUNTED AT EXTERIOR WALLS BELOW GRADE TO ESTABLISH 1/2" AIR SPACE BEHIND PANEL.
10. PROVIDE TYPED PANELBOARD DIRECTORIES THAT SHOW USE OF EACH CIRCUIT AND ELECTRICAL CHARACTERISTICS OF PANELBOARD. PANELBOARD DESIGNATIONS SHALL BE LABELED ON THE FRONT OF THE PANEL WITH A SCREW-ON NAMEPLATE, AND ON THE DIRECTORY.

264100 SAFETY DISCONNECT SWITCHES

PART 1 - GENERAL

1.1 SWITCHES

A. PROVIDE UL-LISTED QUICK-MAKE/QUICK-BREAK SAFETY SWITCHES. CURRENT-CARRYING PARTS SHALL BE HIGH-CONDUCTIVITY COPPER. CONTACTS SHALL BE SILVER-TUNGSTEN OR PLATED.

B. TYPE HD, (HEAVY DUTY), UNLESS SPECIFIED OTHERWISE. PROVIDE [DUST PROOF] NEMA 1 ENCLOSURE FOR DRY APPLICATION. PROVIDE NEMA 12 ENCLOSURE FOR MECHANICAL SPACES IN DRY APPLICATIONS. PROVIDE NEMA 3R FOR WET APPLICATIONS. SWITCHES SHALL BE RATED 600V MINIMUM AS REQUIRED FOR VOLTAGE OF ASSOCIATED CIRCUIT AND SHALL BE RATED IN HORSEPOWER. FUSES SHALL INTERRUPT LOCKED ROTOR CURRENT OF ASSOCIATED MOTOR OR TEN TIMES FULL RATED LOAD CURRENT, WHICHEVER IS GREATER.

C. CURRENT-CARRYING PARTS SHALL BE HIGH-CONDUCTIVITY COPPER. CONTACTS SHALL BE SILVER-TUNGSTEN OR PLATED. PROVIDE POSITIVE PRESSURE FUSE CLIPS AND SWITCH OPERATING MECHANISM SUITABLE FOR CONTINUOUS USE AT RATED CAPACITY WITHOUT AUXILIARY SPRINGS IN CURRENT PATH.

D. SWITCHES SHALL WITHSTAND AVAILABLE FAULT CURRENT OR LET-THROUGH CURRENT BEFORE OPERATING, WITHOUT DAMAGE OR RATING CHANGE.

26130 BOXES AND DEVICES

PART 1 - GENERAL

1.1 OUTLET BOXES

A. OUTLET BOXES ON CONCEALED WORK SHALL BE AT LEAST 4" SQUARE OR OCTAGONAL, GALVANIZED PRESSED STEEL WITH PLASTER RINGS AS REQUIRED. OUTLET BOXES FOR EXPOSED CONDUIT WORK SHALL BE CAST ALUMINUM ALLOY WITH CAST ALUMINUM ALLOY COVERS, TYPE "FS" BOX.

B. SWITCH BOXES, RECEPTACLE BOXES AND OTHER OUTLET BOXES SHALL BE STANDARD 4" SQUARE WITH PLASTER RINGS OR GANG COVER AS REQUIRED.

C. OUTLET BOXES SHALL BE BY STEEL CITY ELECTRIC COMPANY, APPLETON ELECTRIC COMPANY, NATIONAL ELECTRIC PRODUCTS COMPANY OR APPROVED EQUAL.

D. PROVIDE ONLY ENOUGH CONDUIT OPENINGS TO ACCOMMODATE CONDUITS AT INDIVIDUAL LOCATION. EACH BOX SHALL BE LARGE ENOUGH TO ACCOMMODATE NUMBER AND SIZES OF CONDUITS, WIRES AND SPLICES TO MEET NEC REQUIREMENTS, BUT SHALL BE AT LEAST SIZE SHOWN OR SPECIFIED. NECESSARY VOLUME SHALL BE OBTAINED BY USING BOXES OF PROPER DIMENSIONS. BOX DEPTHS GREATER THAN 2 " SHALL NOT BE USED TO OBTAIN NECESSARY VOLUME, BUT MAY BE USED WITH ARCHITECT'S APPROVAL TO FACILITATE INSTALLATION. OCTAGONAL HUNG CEILING BOXES WITH SUSPENSION BARS MAY BE 3 1/2 " DEEP. RECTANGULAR BOXES FOR INTER-CONNECTION OF BRANCH CIRCUIT CONDUITS MAY BE 2 1/2 DEEP.

1.2 JUNCTION BOXES, PULL BOXES, AND CABLE TROUGHS

A. PROVIDE CODE GAUGE GALVANIZED STEEL JUNCTION AND PULL BOXES FOR CONDUIT 11/4" TRADE SIZE AND LARGER, WHERE INDICATED AND AS NECESSARY TO FACILITATE INSTALLATION, OF REQUIRED DIMENSIONS, WITH ACCESSIBLE, REMOVABLE SCREW-ON COVERS. PROVIDE JUNCTION AND PULL BOXES IN SPECIAL SIZES AND SHAPES DETERMINED IN FIELD WHERE NECESSARY. JUNCTION BOXES FOR EXPOSED CONDUIT WORK IN FINISHED AREAS SHALL BE CAST ALUMINUM ALLOY WITH CAST ALUMINUM ALLOY COVERS.

B. JUNCTION BOX COVERS SHALL BE READILY ACCESSIBLE. DO NOT INSTALL JUNCTION BOXES ABOVE SUSPENDED CEILINGS EXCEPT WHERE CEILING IS REMOVABLE OR WHERE ACCESS PANEL IS PROVIDED.

1.3 WIRING DEVICES AND PLATES

A. PROVIDE WIRING DEVICES BY SINGLE MANUFACTURER: CATALOG DESIGNATIONS OF HUBBELL ARE SPECIFIED TO ESTABLISH STANDARDS OF QUALITY FOR MATERIALS AND PERFORMANCE ACCEPTABLE ALTERNATES ARE ARROW-HART, LEVITON, BRYANT, OR APPROVED EQUAL.

B. COLOR OF THE DEVICES AND FACEPLATES SHALL BEBY ARCHITECT. NAMEPLATE DESIGNATIONS FOR DEVICE PLATES SHALL BE STICK-ON TYPE WITH PANEL AND CIRCUIT NUMBER.

261200 RACEWAY & WIRING

PART 1 - GENERAL

1.1 RACEWAYS

A. RIGID METALLIC CONDUIT (RMC) AND ELECTRICAL METALLIC TUBING (EMT) SHALL BE OF ZINC-COATED STEEL MANUFACTURED BY ALLIED TUBE AND CONDUIT, WHEATLAND TUBE, OR APPROVED EQUAL.

B. FLEXIBLE METALLIC CONDUIT SHALL BE GALVANIZED STEEL, SPIRAL WRAPPED METALLIC CONDUIT (GREENFIELD).

C. CONDUIT EXPANSION FITTINGS SHALL BE THREADED HOT-DIPPED GALVANIZED MALLEABLE IRON WITH INTERNAL BONDING ASSEMBLY BY O.Z./GEDNEY OR APPROVED EQUAL.

D. CONDUIT FIRE SEAL FITTINGS SHALL HAVE HEAT-ACTIVATED INTUMESCENT MATERIAL FOR FIRE RATING EQUAL TO OR HIGHER THAN THAT OF FLOOR OR WALL BY O.Z./GEDNEY OR APPROVED EQUAL.

E. PROVIDE THREADED MALLEABLE IRON OR STEEL CONNECTORS AND COUPLINGS WITH INSULATED THROATS; MANUFACTURED ELBOWS; LOCKNUTS; AND PLASTIC OR BAKELITE BUSHINGS AT TERMINATIONS, AS NECESSARY. COUPLINGS AND CONNECTORS SHALL BE GLAND AND RING COMPRESSION OR STAINLESS STEEL MULTIPLE POINT LOCKING OR STEEL CONCRETE-TIGHT SET SCREW. COMPRESSION COUPLINGS AND CONNECTORS SHALL FORM POSITIVE GROUND. BUSHINGS FOR RIGID STEEL AND CONNECTORS FOR EMT SHALL HAVE INSULATING INSERTS THAT MEET REQUIREMENTS OF UL 514 FLAME TEST.

1.2 WIRE AND CABLE (600V INSULATION)

A. PROVIDE SINGLE-CONDUCTOR, ANNEALED COPPER WIRE AND CABLE WITH INSULATION RATED 600 V, OF SIZES SPECIFIED AND SCHEDULED ON DRAWINGS BY ROME, OKONITE OR APPROVED EQUAL. WIRE SIZES SHOWN AND SPECIFIED ARE AMERICAN WIRE GAUGE FOR COPPER.

B. WIRE #10 AND LARGER SHALL BE STRANDED. WIRE AND CABLE SHALL HAVE THWN-THHN OR XHHW INSULATION.

1.3 TERMINATIONS

A. PROVIDE STANDARD BOLT-ON LUGS WITH HEX SCREWS TO ATTACH COPPER WIRE AND CABLE TO PANELBOARDS AND ELECTRICAL EQUIPMENT.

1.4 COLOR CODING

A. MAKE TERMINATIONS AND SPLICES FOR CONDUCTORS #6 AND LARGER WITH CORROSION-RESISTANT, HIGH-CONDUCTIVITY PRESSURE INDENT, HEX SCREW OR BOLT-CLAMP CONNECTORS, WITH OR WITHOUT TONGUES, DESIGNED SPECIFICALLY FOR INTENDED SERVICE.

B. COLOR CODE SECONDARY SERVICE, FEEDERS AND BRANCH CIRCUIT CONDUCTORS AS FOLLOWS: 208/120 VOLTS, 3□, 4W - BLACK, RED, BLUE, WHITE, GREEN 480/277 VOLTS, 3□, 4W - BROWN, ORANGE, YELLOW, WHITE, GREEN

PART 2 - INSTALLATION

2.1 WIRING METHODS

A. ALL FEEDERS SHALL BE EMT UNLESS NOTED OTHERWISE. REFER TO DETAILS ON DRAWING E8.02 FOR ADDITIONAL INFORMATION.

B. THE BRANCH CIRCUIT WIRING INTENT IS A COMBINATION OF ELECTRICAL METALLIC TUBING (EMT) WITH WIRING AND METAL CLAD (MC) CABLE. ALL HOME RUNS TO THE PANELS MAY BE CONDUIT AND WIRE OR MC CABLE. AS MC CABLE CONVERGES ON THE PANELS THE BRANCH CIRCUITS SHALL BE RUN WITHIN CABLE TRAY WITH A SOLID BOTTOM PLATE. THE PLATE AND TRAY WILL BE PAINTED OUT BY OTHERS.

C. CONDUITS SHALL BE MINIMUM OF 3/4" AND CONTAIN A MAXIMUM OF THREE (3) BRANCH CIRCUITS PER CONDUIT. EACH CIRCUIT SHALL HAVE A DEDICATED NEUTRAL CONDUCTOR FOR EACH PHASE CONDUCTOR.

D. MC CABLE SHALL CONSIST OF SINGLE CIRCUIT CABLE AND MULTI-CONDUCTOR CABLE FOR HOMERUNS THAT CONTAIN A MAXIMUM OF THREE (3) BRANCH CIRCUITS PER CABLE. EACH CIRCUIT SHALL HAVE A DEDICATED NEUTRAL CONDUCTOR FOR EACH PHASE CONDUCTOR.

E. EACH BRANCH CIRCUIT SHALL CONTAIN AN EQUIPMENT GROUND CONDUCTOR. THE EQUIPMENT GROUND CONDUCTOR MAY BE SHARED AMONGST A MAXIMUM OF THREE (3) BRANCH CIRCUITS RUN AS A MULTI-WIRE BRANCH CIRCUIT.

F. INSTALL CONNECTORS AND COUPLINGS AS RECOMMENDED BY MANUFACTURERS. COMPRESSION FITTINGS SHALL NOT BE USED WITH RIGID STEEL OR INTERMEDIATE METALLIC CONDUITS.

G. SIZE RIGID STEEL CONDUIT, EMT AND FLEXIBLE METALLIC CONDUIT AS REQUIRED BY NEC EXCEPT AS SPECIFIED OR SHOWN ON DRAWINGS OTHERWISE.

H. INSTALL CONDUIT SYSTEMS COMPLETE BEFORE DRAWING IN CONDUCTORS. BLOW THROUGH AND CLEAN CONDUIT FREE OF DEBRIS BEFORE CONDUCTORS ARE INSTALLED.

I. CHECK RACEWAY SIZES TO DETERMINE THAT GREEN EQUIPMENT GROUND CONDUCTOR FITS IN SAME RACEWAY WITH PHASE AND NEUTRAL CONDUCTORS TO MEET NEC PERCENTAGE OF FILL REQUIREMENTS. INCREASE DUCT, CONDUIT, TUBING AND RACEWAY SIZES SHOWN OR SPECIFIED AS REQUIRED TO ACCOMMODATE CONDUCTORS.

J. EXPANSION/DEFLECTION FITTINGS: CONDUIT OR EMT SECURED RIGIDLY ON OPPOSITE SIDES OF BUILDING EXPANSION JOINTS AND LONG RUNS OF EXPOSED RACEWAY SUBJECT TO STRESS SHALL HAVE EXPANSION FITTINGS. FITTINGS SHALL SAFELY DEFLECT AND EXPAND TO TWICE DISTANCE OF STRUCTURAL MOVEMENT.PROVIDE SEPARATE EXTERNAL COPPER BONDING JUMPER SECURED WITH GROUNDING STRAPS ON EACH END OF FITTING.

K. ATTACH PULL ROPES TO CONDUCTORS WITH BASKET-WEAVE GRIPS ON PULLING EYES. PULL CABLES THAT SHARE CONDUIT AT SAME TIME.

L. WIRE AND CONDUIT SIZES INDICATED ON HOMERUNS SHALL BE CONTINUOUS THROUGHOUT THE CIRCUIT. CONDUIT HOMERUNS SHOWN ON THE DRAWING WITH MORE THAN 3 CURRENT CARRYING CONDUCTORS ARE SHOWN DIAGRAMATICALLY. THIS CONTRACTOR SHALL NOT INSTALL MORE THAN 3 CURRENT CARRYING CONDUCTORS IN A RACEWAY UNLESS DONE SO STRICTLY BY THE NATIONAL ELECTRIC CODE.

M. THE E.C. IS RESPONSIBLE FOR ALL NECESSARY CORE DRILLING. ALSO, THE E.C. SHALL PROVIDE FIRE STOPPING AND WEATHERPROOF SEALANT AROUND THE ANNULAR OF EACH CONDUIT THAT IS CORE DRILLED.

N. ALL CONDUITS SHALL BE SUPPORTED BY USE OF HOT DIPPED GALVANIZED POWER STRUT, RACKS, THREADED ROD, BEAM CLAMPS, POWER TRAP AND ALL NECESSARY ACCESSORIES FOR A COMPLETE WIRING SYSTEM. ALL RACKS SHALL BE PROVIDED WITH DOUBLE TIERS FOR FUTURE CONDUITS.

O. ALL WIRING SHALL BE RUN CONCEALED WHERE POSSIBLE.

260100 BASIC ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.1 REFERENCES

A. THE WORK REQUIREMENTS DESCRIBED WITHIN DIVISION 20 SPECIFICATION SECTION "COMMON MECHANICAL/ELECTRICAL REQUIREMENTS" FORM COMPLIMENTARY REQUIREMENTS TO THE SCOPE OF WORK CONTAINED WITHIN DIVISION 23. REFER TO DRAWING H0.2 FOR SAID DIVISION 20 REQUIREMENTS.

B. EXAMINE DRAWINGS AND OTHER SECTIONS OF SPECIFICATIONS FOR REQUIREMENTS THAT AFFECT WORK OF THIS SECTION.

C. AS USED IN THIS SECTION, "PROVIDE" MEANS "FURNISH AND INSTALL" AND "POS" MEANS "PROVIDED UNDER OTHER SECTIONS". "FURNISH" MEANS "TO PURCHASE AND DELIVER TO THE PROJECT SITE COMPLETE WITH EVERY NECESSARY APPURTENANCE AND SUPPORT," AND "INSTALL" MEANS "TO UNLOAD AT THE DELIVERY POINT AT THE SITE AND PERFORM EVERY OPERATION NECESSARY TO ESTABLISH SECURE MOUNTING AND CORRECT OPERATION AT THE PROPER LOCATION IN THE PROJECT."

D. PERFORM WORK AND PROVIDE MATERIAL AND EQUIPMENT AS SHOWN ON DRAWINGS AND AS SPECIFIED OR INDICATED IN THIS SECTION OF THE SPECIFICATIONS. PROVIDE WORK SPECIFIED AND NOT SHOWN, AND WORK SHOWN AND NOT SPECIFIED AS THOUGH EXPLICITLY REQUIRED BY BOTH. ALTHOUGH WORK IS NOT SPECIFICALLY SHOWN OR SPECIFIED, PROVIDE SUPPLEMENTARY OR MISCELLANEOUS ITEMS, APPURTENANCES, DEVICES AND MATERIALS OBVIOUSLY NECESSARY FOR A SOUND, SECURE AND COMPLETE INSTALLATION. REMOVE ALL DEBRIS CAUSED BY CONTRACTORS WORK.

E. AS WORK PROGRESSES AND FOR DURATION OF CONTRACT, MAINTAIN COMPLETE AND SEPARATE SET OF PRINTS OF CONTRACT DRAWINGS AT JOB SITE AT ALL TIMES. RECORD WORK COMPLETED AND ALL CHANGES FROM ORIGINAL CONTRACT DRAWINGS CLEARLY AND ACCURATELY INCLUDING WORK INSTALLED AS A MODIFICATION OR ADDITION TO THE ORIGINAL DESIGN.

F. ITEMS REFERRED TO IN SINGULAR NUMBER IN CONTRACT DOCUMENTS SHALL BE PROVIDED IN QUANTITIES NECESSARY TO COMPLETE WORK.

1.2 CONTRACT DOCUMENTS

A. EXCEPT WHERE MODIFIED BY A SPECIFIC NOTATION TO THE CONTRARY, IT SHALL BE UNDERSTOOD THAT THE INDICATION AND/OR DESCRIPTION OF ANY ITEM, IN THE DRAWINGS OR SPECIFICATIONS OR BOTH, CARRIES WITH IT THE INSTRUCTION TO FURNISH AND INSTALL THE ITEM, REGARDLESS OF WHETHER OR NOT THIS INSTRUCTION IS EXPLICITLY STATED AS PART OF THE INDICATION OR DESCRIPTION.

B. DRAWINGS ARE DIAGRAMMATIC. THEY ARE NOT INTENDED TO BE ABSOLUTELY PRECISE; THEY ARE NOT INTENDED TO SPECIFY OR TO SHOW EVERY OFFSET, FITTING, AND COMPONENT. THE PURPOSE OF THE DRAWINGS IS TO INDICATE A SYSTEMS CONCEPT, THE MAIN COMPONENTS OF THE SYSTEMS, AND THE APPROXIMATE GEOMETRICAL RELATIONSHIPS. BASED ON THE SYSTEMS CONCEPT, THE MAIN COMPONENTS, AND THE APPROXIMATE GEOMETRICAL RELATIONSHIPS, THE CONTRACTOR SHALL PROVIDE ALL OTHER COMPONENTS AND MATERIALS NECESSARY TO MAKE THE SYSTEMS FULLY COMPLETE AND OPERATIONAL.

C. BRANCH CIRCUIT WIRING MAY NOT BE GRAPHICALLY SHOWN ON DRAWINGS AND MAY BE SHOWN BY CIRCUIT NUMBERS BESIDE DEVICES AND EQUIPMENT. PROVIDE COMPLETE WIRING SYSTEM WHETHER OR NOT SHOWN GRAPHICALLY. WIRING IS SHOWN BY CONDUIT RUNS ON DRAWINGS WHERE SPECIFIC ROUTING IS REQUIRED OR FOR SPECIAL REASONS. ONLY ROOMS WITH MULTIPLE SWITCHING HAVE "SWITCH CONTROL LETTERS" ASSIGNED.

D. REMOVE, EXTEND, ALTER AND RECONNECT EXISTING CONDUITS AS DIRECTED BY OWNER. RECONNECT EXISTING CONDUIT THAT IS CUT AND DISCONNECTED TO ACCOMMODATE WORK. PROVIDE NEW CONDUIT WHERE WIRE CANNOT BE PULLED IN EXISTING. CONNECT NEW AND EXISTING WORK TO FUNCTION AS COMPLETE, CONTINUOUSLY GROUNDED SYSTEM. REMOVE CONDUIT AND EQUIPMENT NOT INTENDED FOR REUSE AND STORE WHERE DIRECTED.

E. THE E.C. SHALL FURNISH AND INSTALL ALL INCIDENTAL ACCESSORIES NECESSARY TO MAKE THE ELECTRICAL WORK COMPLETE AND READY FOR OPERATION.

F. EXACT LOCATION OF MECHANICAL EQUIPMENT THAT REQUIRE ELECTRICAL CONNECTIONS ARE SHOWN ON THE MECHANICAL DRAWINGS.

1.3 DISCREPANCIES IN DOCUMENTS

A. ADDRESS QUESTIONS REGARDING DRAWINGS TO OWNER IN WRITING BEFORE AWARD OF CONTRACT. OTHERWISE, OWNER'S INTERPRETATION OF MEANING AND INTENT OF DRAWINGS SHALL BE FINAL.

1.4 CODES, STANDARDS, AUTHORITIES, AND PERMITS

A. PERFORM WORK IN STRICT ACCORDANCE WITH THE RULES, REGULATIONS, STANDARDS, CODES, ORDINANCES, AND LAWS OF LOCAL, STATE, AND OTHER AUTHORITIES HAVING LEGAL JURISDICTION OVER THE SITE.

B. MATERIAL AND EQUIPMENT SHALL BE LISTED BY UNDERWRITERS' LABORATORIES (UL).

C. GIVE NOTICES, FILE PLANS, OBTAIN PERMITS AND LICENSES, PAY FEES AND BACKCHARGES, AND OBTAIN NECESSARY APPROVALS FROM AUTHORITIES THAT HAVE JURISDICTION.

1.5 GUARENTEE

A. GUARANTEE WORK IN WRITING FOR ONE YEAR FROM DATE OF FINAL ACCEPTANCE. REPAIR OR REPLACE DEFECTIVE MATERIALS OR INSTALLATION AT NO COST TO OWNER. CORRECT DAMAGE CAUSED IN MAKING NECESSARY REPAIRS AND REPLACEMENTS UNDER GUARANTEE AT NO COST TO OWNER.

B. SUBMIT GUARANTEE TO OWNER BEFORE FINAL PAYMENT.

C. STATEMENT OF GUARANTEE REQUIREMENTS SHALL NOT BE INTERPRETED TO LIMIT OWNER'S RIGHTS UNDER LAW AND THIS CONTRACT.

1.6 SUBMITTALS

A. SUBMIT SHOP DRAWINGS AND PRODUCT DATA WITHIN 30 DAYS AFTER AWARD OF CONTRACT. CHECK, STAMP AND MARK WITH PROJECT NAME SUBMITTALS BEFORE TRANSMITTING TO OWNER. INDICATE DEVIATIONS FROM CONTRACT DOCUMENTS.

B. DEVIATIONS FROM CONTRACT DOCUMENTS, OR PROPOSED SUBSTITUTION OF MATERIALS OR EQUIPMENT FOR THOSE SPECIFIED SHALL BE REQUESTED IN SEPARATE LETTER WHETHER DEVIATIONS ARE DUE TO FIELD CONDITIONS, STANDARD SHOP PRACTICE, OR OTHER CAUSE.

C. SCHEDULE AT LEAST TEN WORKING DAYS, EXCLUSIVE OF TRANSMITTAL TIME, FOR SUBMITTAL REVIEW.

D. MATERIAL AND EQUIPMENT REQUIRING SHOP DRAWING AND PRODUCT DATA SUBMITTAL SHALL INCLUDE CABLE, CONDUIT, DISCONNECTS, VFD'S AND FILTERS.

1.7 NAMEPLATES

A. PROVIDE NAMEPLATES IN OR ON PANELBOARDS. NAMEPLATES SHALL BE WHITE BAKELITE WITH 1/4" HIGH BLACK RECESSED LETTERS. NAMEPLATES SHALL BE SECURED TO EQUIPMENT WITH GALVANIZED SCREWS.

1.8 MATERIALS AND WORKMANSHIP

A. WORK SHALL BE EXECUTED IN WORKMANLIKE MANNER AND SHALL PRESENT NEAT, RECTILINEAR AND MECHANICAL APPEARANCE WHEN COMPLETED. MAINTAIN MAXIMUM HEADROOM AT ALL TIMES. DO NOT RUN RACEWAYS EXPOSED UNLESS SHOWN EXPOSED ON DRAWINGS. MATERIAL AND EQUIPMENT SHALL BE NEW AND INSTALLED ACCORDING TO MANUFACTURER'S RECOMMENDED BEST PRACTICE SO THAT COMPLETED INSTALLATION SHALL OPERATE SAFELY AND EFFICIENTLY.

1.9 CONTINUITY OF SERVICES

A. DO NOT INTERRUPT EXISTING SERVICES WITHOUT OWNER'S AND ENGINEER'S APPROVALS.

260600 GROUNDING AND BONDING

PART 1 - GENERAL

1.1 GROUNDING

A. PROVIDE EQUIPMENT GROUNDING SYSTEM AS PER N.E.C.

B. SYSTEM SHALL MEET NEC REQUIREMENTS, MODIFIED AS SHOWN ON DRAWINGS AND AS SPECIFIED.

C. A GROUNDING CONDUCTOR SHALL BE INCLUDED IN EACH RACEWAY AND SIZED IN ACCORDANCE WITH THE N.E.C.

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REVISIONS

ELECTRICAL SPECIFICATIONS SHEET 1

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