

SECTION 16A GENERAL ELECTRICAL REQUIREMENTS:

16A GENERAL INSTRUCTIONS

16A GENERAL REQUIREMENTS

ALL REQUIREMENTS UNDER DIVISION 1 AND THE GENERAL AND SUPPLEMENTARY CONDITIONS OF THESE SPECIFICATIONS APPLY TO THIS SECTION AND DIVISION. WHERE THE REQUIREMENTS OF THIS SECTION AND DIVISION EXCEED THOSE OF DIVISION 1, THIS SECTION AND DIVISION TAKE PRECEDENCE. BECOME THOROUGHLY FAMILIAR WITH ALL THEIR CONTENTS AS TO REQUIREMENTS THAT AFFECT THIS DIVISION, SECTION OR BOTH. WORK REQUIRED UNDER THIS DIVISION INCLUDES ALL MATERIAL, EQUIPMENT, ACCESSORIES AND LABOR REQUIRED TO COMPLETE THE ENTIRE ELECTRICAL SYSTEM AS REQUIRED BY THE DRAWINGS AND SPECIFICATIONS, OR REASONABLY INFERRED TO BE NECESSARY TO FACILITATE EACH SYSTEM'S FUNCTIONING AS IMPLIED BY THE DESIGN AND THE EQUIPMENT SPECIFIED.

THE SPECIFICATIONS AND DRAWINGS FOR THE PROJECT ARE COMPLEMENTARY, AND PORTIONS OF THE WORK DESCRIBED IN ONE SHALL BE PROVIDED AS IF DESCRIBED IN BOTH. IN THE EVENT OF DISCREPANCIES, NOTIFY THE ENGINEER AND REQUEST CLARIFICATION PRIOR TO PROCEEDING WITH THE WORK INVOLVED.

DRAWINGS ARE GRAPHIC REPRESENTATIONS OF THE WORK UPON WHICH THE CONTRACT IS BASED. THEY SHOW THE MATERIALS AND THEIR RELATIONSHIP TO ONE ANOTHER, INCLUDING SIZES, SHAPES, LOCATIONS, AND CONNECTIONS. THEY ALSO CONVEY THE SCOPE OF WORK, INDICATING THE INTENDED GENERAL ARRANGEMENT OF EQUIPMENT, FIXTURES, OUTLETS AND CIRCUITS WITHOUT SHOWING ALL OF THE EXACT DETAILS AS TO ELEVATIONS, OFFSETS, CONTROL LINES, AND OTHER INSTALLATION REQUIREMENTS. USE THE DRAWINGS AS A GUIDE WHEN LAYING OUT THE WORK AND TO VERIFY THAT MATERIALS AND EQUIPMENT WILL FIT INTO THE DESIGNATED SPACES, AND WHICH, WHEN INSTALLED PER MANUFACTURERS' REQUIREMENTS, WILL ENSURE A COMPLETE, COORDINATED, SATISFACTORY AND PROPERLY OPERATING SYSTEM.

DRAWINGS ARE SCHEMATIC IN NATURE. SHOW THE VARIOUS COMPONENTS OF THE SYSTEMS APPROXIMATELY TO SCALE AND ATTEMPT TO INDICATE HOW THEY SHALL BE INTEGRATED WITH OTHER PARTS OF THE WORK. FIGURED DIMENSIONS TAKE PRECEDENCE TO SCALED DIMENSIONS. DETERMINE EXACT LOCATIONS BY JOB MEASUREMENTS, BY CHECKING THE REQUIREMENTS OF OTHER TRADES, AND BY REVIEWING ALL CONTRACT DOCUMENTS. CORRECT ERRORS THAT COULD HAVE BEEN AVOIDED BY PROPER CHECKING AND INSPECTION, AT NO ADDITIONAL COST TO THE OWNER.

SPECIFICATIONS DEFINE THE QUALITATIVE REQUIREMENTS FOR PRODUCTS, MATERIALS, AND WORKMANSHIP UPON WHICH THE CONTRACT IS BASED.

16A DEFINITIONS

WHENEVER USED IN THESE SPECIFICATIONS OR DRAWINGS, THE FOLLOWING TERMS SHALL HAVE THE INDICATED MEANINGS:

FURNISH: TO SUPPLY AND DELIVER TO THE PROJECT SITE, READY FOR UNLOADING, UNPACKING, ASSEMBLING, INSTALLING, AND SIMILAR OPERATIONS.

INSTALL: TO PERFORM ALL OPERATIONS AT THE PROJECT SITE, INCLUDING, BUT NOT LIMITED TO, UNLOADING, UNPACKING, ASSEMBLING, ERECTING, PLACING, ANCHORING, APPLYING, WORKING TO DIMENSION, FINISHING, CURING, PROTECTING, CLEANING, TESTING, COMMISSIONING, STARTING UP AND SIMILAR OPERATIONS, COMPLETE, AND READY FOR THE INTENDED USE.

PROVIDE: TO FURNISH AND INSTALL COMPLETE, AND READY FOR THE INTENDED USE.

FURNISHED BY OWNER (OR OWNER-FURNISHED) OR FURNISHED BY OTHERS: AN ITEM FURNISHED BY THE OWNER OR UNDER OTHER DIVISIONS OR CONTRACTS, AND INSTALLED UNDER THE REQUIREMENTS OF THIS DIVISION, COMPLETE, AND READY FOR THE INTENDED USE, INCLUDING ALL ITEMS AND SERVICES INCIDENTAL TO THE WORK NECESSARY FOR PROPER INSTALLATION AND OPERATION. INCLUDE THE INSTALLATION UNDER THE WARRANTY REQUIRED BY THIS DIVISION.

ENGINEER: WHERE REFERENCED IN THIS DIVISION, "ENGINEER" IS THE ENGINEER OF RECORD AND THE DESIGN PROFESSIONAL FOR THE WORK UNDER THIS DIVISION, AND IS A CONSULTANT TO, AND AN AUTHORIZED REPRESENTATIVE OF, THE ARCHITECT, AS DEFINED IN THE GENERAL AND/OR SUPPLEMENTARY CONDITIONS. WHEN USED IN THIS DIVISION, IT MEANS INCREASED INVOLVEMENT BY, AND OBLIGATIONS TO, THE ENGINEER, IN ADDITION TO INVOLVEMENT BY, AND OBLIGATIONS TO, THE ARCHITECT.

AHJ: THE LOCAL CODE AND/OR INSPECTION AGENCY (AUTHORITY) HAVING JURISDICTION OVER THE WORK.

NRTL: NATIONALLY RECOGNIZED TESTING LABORATORY, AS DEFINED AND LISTED BY OSHA IN 29 CFR 1910.7 (E.G., UL, ETL, CSA), AND ACCEPTABLE TO THE AHJ OVER THIS PROJECT.

HOMERUN: THAT PORTION OF AN ELECTRICAL CIRCUIT ORIGINATING AT A JUNCTION BOX, TERMINATION BOX, RECEPTACLE OR SWITCH WITH TERMINATION AT AN ELECTRICAL PANELBOARD. NOTE: WHERE MC CABLE IS UTILIZED FOR RECEPTACLE AND/OR LIGHTING BRANCH CIRCUITING LOADS, THE ORIGINATING POINT OF THE HOMERUN SHALL BE AT THE FIRST LOAD IN THE CIRCUIT OR AT A JUNCTION BOX IN AN ACCESSIBLE CEILING SPACE IMMEDIATELY ABOVE THE FIRST LOAD.

THE TERMS "APPROVED EQUAL," "EQUIVALENT," OR "EQUAL" ARE USED SYNONYMously AND SHALL MEAN "ACCEPTED BY OR ACCEPTABLE TO THE ENGINEER AS EQUIVALENT TO THE ITEM OR MANUFACTURER SPECIFIED." THE TERM "APPROVED" SHALL MEAN LABELED, LISTED, CERTIFIED, OR ALL THREE, BY AN NRTL, AND ACCEPTABLE TO THE AHJ OVER THIS PROJECT.

16A PRE-BID SITE VISIT

PERSONALLY INSPECT THE SITE OF THE PROPOSED WORK AND BECOME FULLY INFORMED OF CONDITIONS UNDER WHICH THE WORK IS TO BE DONE. FAILURE TO DO SO WILL NOT BE CONSIDERED SUFFICIENT JUSTIFICATION TO REQUEST OR OBTAIN EXTRA COMPENSATION OVER AND ABOVE THE CONTRACT PRICE.

16A MATERIAL AND WORKMANSHIP

PROVIDE ALL MATERIAL AND EQUIPMENT NEW AND IN FIRST CLASS CONDITION. PROVIDE MARKINGS OR A NAMEPLATE FOR ALL MATERIAL AND EQUIPMENT IDENTIFYING THE MANUFACTURER AND PROVIDING SUFFICIENT REFERENCE TO ESTABLISH QUALITY, SIZE AND CAPACITY. ALL WORKMANSHIP SHALL BE OF THE FINEST POSSIBLE BY EXPERIENCED MECHANICS OF THE PROPER TRADE. IN GENERAL, PROVIDE THE FOLLOWING QUALITY GRADE(S) FOR ALL MATERIALS AND EQUIPMENT:

COMMERCIAL SPECIFICATION GRADE

PROVIDE ALL HOISTS, SCAFFOLDS, STAGING, RUNWAYS, TOOLS, MACHINES AND EQUIPMENT REQUIRED FOR THE PERFORMANCE OF THE ELECTRICAL WORK, STORE AND MAINTAIN MATERIAL AND EQUIPMENT IN CLEAN CONDITION, AND PROTECTED FROM WEATHER, MOISTURE, AND PHYSICAL DAMAGE.

FURNISH ONLY MATERIAL AND EQUIPMENT THAT ARE LISTED, LABELED, CERTIFIED OR ALL THREE, BY A NATIONALLY RECOGNIZED TESTING LABORATORY (NRTL), WHENEVER ANY LISTING OR LABELING EXISTS FOR THE TYPES OF MATERIAL AND EQUIPMENT SPECIFIED.

AT A MINIMUM, GENERAL WORK PRACTICES FOR ELECTRICAL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE STANDARD PRACTICES FOR GOOD ELECTRICIAN WORKMANSHIP IN ELECTRICAL CONSTRUCTION.

16A MANUFACTURERS

IN OTHER ARTICLES WHERE LISTED MANUFACTURERS ARE INTRODUCED, SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE EQUIVALENTS BY ONE OF THE MANUFACTURERS SPECIFIED.

WHERE A LIST OF PROVIDED MANUFACTURERS ARE LISTED ALPHABETICALLY AND NOT IN ACCORDANCE WITH ANY RANKING OR PREFERENCE.

WHERE MANUFACTURERS ARE NOT LISTED, PROVIDE PRODUCTS SUBJECT TO COMPLIANCE WITH REQUIREMENTS FROM MANUFACTURERS THAT HAVE BEEN ACTIVELY INVOLVED IN MANUFACTURING THE SPECIFIED PRODUCT FOR NO LESS THAN 5 YEARS.

16A COORDINATION

COORDINATE ALL WORK WITH OTHER DIVISIONS AND TRADES SO THAT VARIOUS COMPONENTS OF THE ELECTRICAL SYSTEMS ARE INSTALLED AT THE PROPER TIME, FIT THE AVAILABLE SPACE, AND ALLOW PROPER SERVICE ACCESS TO ALL EQUIPMENT. REFER TO ALL DRAWINGS, INCLUDING, BUT NOT LIMITED TO, CIVIL, ARCHITECTURAL, STRUCTURAL, MECHANICAL, AND PLUMBING, AND TO RELEVANT EQUIPMENT SUBMITTALS AND SHOP DRAWINGS TO DETERMINE THE EXTENT OF CLEAR SPACES. MAKE ALL OFFSETS REQUIRED TO CLEAR EQUIPMENT, BEAMS AND OTHER STRUCTURAL MEMBERS, AND TO FACILITATE CONCEALING RACEWAYS IN THE MANNER ANTICIPATED IN THE DESIGN. PROVIDE MATERIALS WITH TRIM THAT WILL FIT PROPERLY THE TYPES OF CEILING, WALL, OR FLOOR FINISHES ACTUALLY INSTALLED.

16A ORDINANCES, CODES, AND STANDARDS

COMPLY, AT A MINIMUM, WITH NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) STANDARDS, STATE AND LOCAL BUILDING CODES, AND ALL OTHER APPLICABLE CODES AND ORDINANCES FOR PERFORMANCE, WORKMANSHIP, EQUIPMENT, AND MATERIALS. ADDITIONALLY, COMPLY WITH RULES AND REGULATIONS OF PUBLIC UTILITIES AND MUNICIPAL DEPARTMENTS AFFECTED BY CONNECTION OF SERVICES.

WHERE CONFLICTS BETWEEN VARIOUS CODES, ORDINANCES, RULES, AND REGULATIONS EXIST, COMPLY WITH THE STRICTEST. WHEREVER THERE ARE DIFFERENCES OF THESE SPECIFICATIONS, DRAWINGS, OR BOTH, EXCEED THOSE OF THE ABOVE ITEMS, THE REQUIREMENTS OF THESE SPECIFICATIONS, DRAWINGS, OR BOTH, SHALL GOVERN. CODE COMPLIANCE, AT A MINIMUM, IS MANDATORY. CONTRIBUTE NOTHING IN THESE CONSTRUCTION DOCUMENTS AS PERMITTING WORK NOT IN COMPLIANCE, AT A MINIMUM, WITH THESE CODES.

PROVIDE FULLY TRAINED PERSONNEL TO COMPLETE THE WORK. BE HELD RESPONSIBLE FOR ANY VIOLATION OF THE LAW.

PROVIDE AND MAINTAIN ALL NECESSARY SIGNAL LIGHTS AND GUARDS FOR THE SAFETY OF THE PUBLIC. OBTAIN AND PAY FOR ALL PERMITS FOR WORK IN THIS DIVISION.

16A PROTECTION OF EQUIPMENT AND MATERIALS

STORE AND PROTECT FROM DAMAGE EQUIPMENT AND MATERIALS DELIVERED TO JOB SITE, IN ACCORDANCE WITH MANUFACTURERS' RECOMMENDATIONS FOR MATERIALS AND EQUIPMENT SUSCEPTIBLE TO CHANGING WEATHER CONDITIONS, DAMPNESS, OR TEMPERATURE VARIATIONS. STORE INSIDE IN CONDITION SPACES. FOR MATERIALS AND EQUIPMENT NOT SUCEPTIBLE TO THESE CONDITIONS, COVER WITH WATERPROOF, TEAR-RESISTANT TARP OR POLYETHYLENE PLASTIC AS REQUIRED TO PROTECT FROM PLASTER, DIRT, PAINT, WATER, OR PHYSICAL DAMAGE. EQUIPMENT AND MATERIAL THAT HAS BEEN DAMAGED BY CONSTRUCTION ACTIVITIES WILL BE REPAIRED BY THE CONTRACTOR. FURNISH NEW EQUIPMENT AND MATERIAL OF A LIKE KIND.

PLUG OR CAP OPEN ENDS OF CONDUITS WHILE STORED AND INSTALLED DURING CONSTRUCTION WHEN NOT IN USE TO PREVENT THE ENTRANCE OF DEBRIS INTO THE SYSTEMS.

16A SUBSTITUTIONS

INCLUDE IN THE BASE BID THE PRODUCTS SPECIFICALLY NAMED IN THESE SPECIFICATIONS OR ON THE DRAWINGS. SUBMIT, IN THE FORM OF ALTERNATES, WITH BID, PRODUCTS OF ANY OTHER MANUFACTURER FOR SIMILAR USE, AND PROVIDE THE DIFFERENCES IN COST, IF ANY, ARE INCLUDED FOR EACH PROPOSED ALTERNATE.

PRIOR TO THE BID DATE, SUBSTITUTIONS WILL NOT BE CONSIDERED UNLESS SUBMITTED FOR ENGINEER'S REVIEW, AT LEAST TEN CALENDAR DAYS PRIOR TO THE DATE FOR RECEIPT OF BIDS. INCLUDE THE NAME OF THE MATERIAL OR EQUIPMENT FOR WHICH IT IS TO BE SUBSTITUTED AND A COMPLETE DESCRIPTION OF THE PROPOSED SUBSTITUTE INCLUDING CUTSHEETS, PHOTOMETRIC DATA, AND ALL OTHER INFORMATION NECESSARY FOR AN EVALUATION FOR EACH SUCH REQUEST. PROVIDE FACTORY GENERATED POINT-BY-POINT CALCULATIONS FOR ALL EXTERIOR LIGHT FIXTURES (PHOTOMETRIC DATA GENERATING SOFTWARE TO COMPUTE A POINT-BY-POINT CALCULATION). PROVIDE INTERIOR POINT-BY-POINT CALCULATIONS AT THE DISCRETION OF THE ENGINEER. SUBMIT A \$100.00 REVIEW FEE TO THE ENGINEER WITH EACH SUCH POINT-BY-POINT CALCULATION FOR USE OF ELECTRONIC BASE FILES.

AFTER THE BID DATE, PROPOSALS TO SUBSTITUTE LIGHT FIXTURES FOR THOSE SHOWN ON THE DRAWINGS OR SPECIFIED HEREIN, WILL ONLY BE CONSIDERED AS A REDUCT. SUBMIT PROPOSED SUBSTITUTIONS TOGETHER WITH A DEDUCT PRICE FOR EACH SUBSTITUTION. THE ENGINEER WILL THEN REVIEW THE PROPOSED SUBSTITUTIONS.

THE ENGINEER WILL HAVE THE FINAL AUTHORITY AS TO WHETHER THE RIGHT FIXTURE IS AN ACCEPTABLE REPLACEMENT TO THE SPECIFIED ITEM. THE PROPOSED SUBSTITUTION MAY ALSO BE REJECTED BY THE ARCHITECT, AT THE ENGINEER OR THE OWNER FOR AESTHETIC REASONS IF FELT NECESSARY OR DESIRABLE. IN THE EVENT THE PROPOSED SUBSTITUTIONS HEREIN DESCRIBE ARE REJECTED, FURNISH THE SPECIFIED ITEM.

16A SUBMITTALS

ASSEMBLE AND SUBMIT FOR ENGINEER'S REVIEW, MANUFACTURERS' PRODUCT LITERATURE FOR MATERIAL AND EQUIPMENT TO BE FURNISHED, INSTALLED, OR BOTH, UNDER THIS DIVISION, INCLUDING SHOP DRAWINGS, MANUFACTURERS' PRODUCT DATA AND PERFORMANCE SHEETS, SAMPLES, AND OTHER SUBMITTALS REQUIRED BY THIS DIVISION. HIGHLY DEVELOPED AND COMPLETE. PROVIDE PERFORMANCE CRITERIA AND ACCESSORIES THAT ARE BEING PROPOSED. PROVIDE THE NUMBER OF SUBMITTALS REQUIRED BY THE SPECIFICATIONS. HOWEVER, AT A MINIMUM, SUBMIT SEVEN (7) SETS. BEFORE ANY WRITING, VERIFY THAT ALL MATERIALS AND EQUIPMENT SUBMITTED ARE THE SAME AS SHOWN IN THE DRAWINGS. ALL SUBMITTALS INTENDED USE, FIT THE AVAILABLE SPACE, AND ALLOW EASY AND CODE-REQUIRED ROOM FOR ACCESS AND MAINTENANCE. SUBMITTALS SHALL CONTAIN THE FOLLOWING INFORMATION: SUBMITTALS NOT SO IDENTIFIED WILL BE RETURNED TO THE CONTRACTOR WITHOUT CHARGE.

THE PROJECT NAME AND THE APPLICABLE SPECIFICATION SECTION AND PARAGRAPH.

THE SUBMITTAL DATE

THE CONTRACTOR'S STAMP, WHICH SHALL CERTIFY THAT THE STAMPED DRAWINGS HAVE BEEN CHECKED BY THE CONTRACTOR, COMPLY WITH THE DRAWINGS AND SPECIFICATIONS, AND HAVE BEEN COORDINATED WITH OTHER TRADES.

SUBMITTALS AND SHOP DRAWINGS SHALL NOT CONTAIN HE'S FIRE NAME OR LOGO, NOR SHALL IT CONTAIN THE HE'S ENGINEERS' SEAL AND SIGNATURE. THEY SHALL NOT BE COPIES OF HE'S WORK PRODUCT.

TRANSMIT SUBMITTALS AS EARLY AS REQUIRED TO SUPPORT THE PROJECT SCHEDULE. ALLOW FOR TWO WEEKS ENGINEER REVIEW TIME, PLUS MAILING TIME. PLACE A DUPLICATION OF THE SUBMITTALS AT THE PROJECT OFFICE FOR THE ENGINEER'S REVIEW AS SOON AS POSSIBLE AFTER NOTICE TO PROCEED AND BEFORE CONSTRUCTION STARTS. THE ENGINEER'S SUBMITTAL REVIEWS WILL NOT RELIEVE THE CONTRACTOR FROM RESPONSIBILITY FOR ERRORS IN DIMENSIONS, DETAILS, SIZE OF MEMBERS, OR QUANTITIES, OR FOR OMITTING COMPONENTS OR FITTINGS; OR FOR NOT COORDINATING ITEMS WITH ACTUAL BUILDING CONDITIONS.

REFER TO DIVISION 1 FOR ACCEPTANCE OF ELECTRONIC SUBMITTALS FOR THIS PROJECT. FOR ELECTRONIC SUBMITTALS, CONTRACTOR SHALL SUBMIT THE DOCUMENTS IN ACCORDANCE WITH THE PROCEDURES SPECIFIED IN DIVISION 1. CONTRACTOR SHALL NOTIFY THE ARCHITECT AND ENGINEER THAT THE SHOP DRAWINGS HAVE BEEN POSTED. IF ELECTRONIC SUBMITTAL PROCEDURES ARE NOT DEFINED IN DIVISION 1, CONTRACTOR SHALL INCLUDE THE WEBSITE, USER NAME AND PASSWORD INFORMATION NEEDED TO ACCESS THE SUBMITTALS. FOR SUBMITTALS SENT BY E-MAIL, CONTRACTOR SHALL COPY THE ARCHITECT AND ENGINEER'S DESIGNATED REPRESENTATIVE. CONTRACTOR SHALL ALLOW THE ENGINEER REVIEW TIME AS SPECIFIED ABOVE IN THE CONSTRUCTION SCHEDULE. CONTRACTOR SHALL SUBMIT ONLY THE DOCUMENTS REQUIRED TO PURCHASE THE MATERIALS AND/OR EQUIPMENT IN THE ELECTRONIC SUBMITTAL AND SHALL CLEARLY INDICATE THE MATERIALS, PERFORMANCE CRITERIA AND ACCESSORIES BEING PROPOSED. GENERAL PRODUCT CATALOG DATA NOT SPECIFICALLY NOTED TO BE PART OF THE SPECIFIED PRODUCT WILL BE REJECTED AND RETURNED WITHOUT REVIEW.

16A ELECTRONIC DRAWING FILES

IN PREPARATION OF SHOP DRAWINGS OR RECORD DRAWINGS, CONTRACTOR MAY, AS AN OPTION, OBTAIN ELECTRONIC DRAWING FILES IN AUTOCAD OR DXF FORMAT FROM THE ENGINEER FOR A SHIPPING AND HANDLING FEE OF \$200 FOR A DRAWING SET UP TO 12 SHEETS AND \$15 PER SHEET FOR EACH ADDITIONAL SHEET. CONTACT THE ARCHITECT FOR WRITTEN AUTHORIZATION AND, CONTACT THE ENGINEER TO OBTAIN THE NECESSARY RELEASE AGREEMENT FORM AND TO INDICATE THE DESIRED SHIPPING METHOD AND DRAWING FORMAT. IN ADDITION TO PAYMENT, ARCHITECT'S WRITTEN AUTHORIZATION AND ENGINEER'S RELEASE AGREEMENT FORM MUST BE RECEIVED BEFORE ELECTRONIC DRAWING FILES WILL BE SENT.

16A OPERATION AND MAINTENANCE INSTRUCTIONS

SUBMIT FOR ENGINEER'S REVIEW, COPIES EACH OF OPERATIONS AND MAINTENANCE INSTRUCTION MANUALS, APPROPRIATELY BOUND INTO MANUAL FORM INCLUDING APPROVED COPIES OF THE FOLLOWING, REVISED IF NECESSARY TO SHOW SYSTEM AND EQUIPMENT AS ACTUALLY INSTALLED. PROVIDE THE NUMBER OF SUBMITTALS REQUIRED BY DIVISION 1; HOWEVER, AT A MINIMUM, SUBMIT THREE (3) SETS, AND INCLUDE, AT A MINIMUM, THE FOLLOWING INFORMATION:

MANUFACTURERS' CATALOGS AND PRODUCT DATA SHEETS

WIRING DIAGRAMS

MAINTENANCE INSTRUCTIONS

OPERATING INSTRUCTIONS

PARTS LISTS

TEST REPORTS AS PERFORMED IN NETA IATS FOR THE SYSTEMS AND EQUIPMENT PROVIDED OR FURNISHED OR INSTALLED UNDER THIS CONTRACT.

NAMES, ADDRESSES, TELEPHONE NUMBERS, AND E-MAIL ADDRESSES OF LOCAL CONTACTS FOR WARRANTY SERVICES AND SPARE PARTS.

SUBMIT MANUALS PRIOR TO REQUESTING THE FINAL PUNCH LIST AND BEFORE ANY REQUESTS FOR SUBSTANTIAL COMPLETION. ALSO PROVIDE ADEQUATE VERBAL INSTRUCTIONS OF SYSTEM OPERATIONS TO OWNER'S REPRESENTATIVE AT THE COMPLETION OF, AND BEFORE FINAL ACCEPTANCE OF, THE WORK.

16A TRAINING

AT A TIME MUTUALLY AGREED UPON BETWEEN THE OWNER AND CONTRACTOR, PROVIDE THE SERVICES OF A FACTORY TRAINED AND AUTHORIZED REPRESENTATIVE TO TRAIN OWNER'S DESIGNATED PERSONNEL ON THE OPERATION AND MAINTENANCE OF THE EQUIPMENT PROVIDED FOR THIS PROJECT.

PROVIDE TRAINING TO INCLUDE BUT NOT BE LIMITED TO AN OVERVIEW OF THE SYSTEM AND/OR EQUIPMENT AS IT RELATES TO THE FACILITY AS A WHOLE; OPERATION AND MAINTENANCE PROCEDURES AND SCHEDULES RELATED TO STARTUP AND SHUTDOWN, TROUBLESHOOTING, SERVICING, PREVENTIVE MAINTENANCE, AND OPERATOR INTERVENTION; AND REVIEW OF DATA INCLUDED IN THE OPERATION AND MAINTENANCE INSTRUCTIONS.

SUBMIT A CERTIFICATION LETTER TO THE ARCHITECT STATING THAT THE OWNER'S DESIGNATED REPRESENTATIVE HAS BEEN TRAINED AS SPECIFIED HEREIN. LETTER SHALL INCLUDE DATE, TIME, ATTENDEES AND SUBJECT OF TRAINING. THE CONTRACTOR AND THE OWNER'S REPRESENTATIVE SHALL SIGN THE CERTIFICATION LETTER INDICATING AGREEMENT THAT THE TRAINING HAS BEEN PROVIDED.

SCHEDULE TRAINING WITH OWNER WITH AT LEAST 7 DAYS' ADVANCE NOTICE.

16A WARRANTIES

WARRANT EACH SYSTEM AND EACH ELEMENT THEREOF AGAINST ALL DEFECTS DUE TO FAULTY WORKMANSHIP, DESIGN OR MATERIAL FOR A PERIOD OF 12 MONTHS FROM DATE OF SUBSTANTIAL COMPLETION. UNLESS OTHERWISE NOTED TO CARRY A LONGER WARRANTY IN THE CONSTRUCTION DOCUMENTS OR THE MANUFACTURER'S STANDARD WARRANTY EXTENDS 12 MONTHS. REMEDY ALL DEFECTS, OCCURRING WITHIN THE WARRANTY PERIOD(S), AS SPECIFIED IN THE GENERAL CONDITIONS AND DIVISION.

ALSO WARRANT THE FOLLOWING ADDITIONAL ITEMS:

ALL RACEWAYS ARE FREE FROM OBSTRUCTIONS, HULLS, BUSHINGS, OR BREAKS OF ANY TYPE.

ALL RACEWAY SEALS ARE EFFECTIVE.

THE ENTIRE ELECTRICAL SYSTEMS ARE FREE FROM ALL SHORT CIRCUITS AND UNWANTED OR HAZARDOUS CIRCUITS AND BONDING.

THE ABOVE WARRANTY SHALL INCLUDE LABOR AND MATERIAL. MAKE REPAIRS OR REPLACEMENTS WITHOUT ADDITIONAL COSTS TO THE OWNER.

PERFORM THE REMEDIAL WORK PROMPTLY, UPON WRITTEN NOTICE FROM THE ENGINEER OR OWNER.

AT THE TIME OF SUBSTANTIAL COMPLETION, DELIVER TO THE OWNER ALL WARRANTIES, IN WRITING AND PROPERLY EXECUTED, INCLUDING TERM LIMITS FOR WARRANTIES EXTENDING BEYOND THE ONE YEAR PERIOD, EACH WARRANTY INSTRUMENT BEING ADDRESSED TO THE OWNER AND STATING THE COMPLETION DATE AND TERM.

16A MISCELLANEOUS REMODELING WORK

PROVIDE ALL DEMOLITION OF EXISTING ELECTRICAL SYSTEMS AND NEW ELECTRICAL SYSTEM MODIFICATIONS REQUIRED BECAUSE OF BUILDING REMODELING, AS NOTED ON THE DRAWINGS, OR NECESSARY FOR PROPER OPERATION AND NEW CONSTRUCTION. REMOVE ALL ABANDONED CABLES AND WIRING ABOVE ACCESSIBLE CEILING AND VENTILATION SHAFTS.

16A ELECTRICAL WORK

16A BUILDING OPERATION

COMPLY WITH THE SCHEDULE OF OPERATIONS AS OUTLINED IN THE ARCHITECTURAL PORTIONS OF THIS SPECIFICATION. BUILDING SHALL BE IN CONTINUOUS OPERATION. ACCOMPLISH WORK THAT REQUIRES INTERRUPTION OF BUILDING OPERATION AT A TIME WHEN THE BUILDING IS NOT IN OPERATION, AND ONLY WITH WRITTEN APPROVAL OF BUILDING OWNER AND/OR TENANT. COORDINATE INTERRUPTION OF BUILDING OPERATION WITH THE OWNER AND/OR TENANT A MINIMUM OF 7 DAYS IN ADVANCE OF WORK.

16A COINCIDENTAL DAMAGE

REPAIR ALL STREETS, SIDEWALKS, DRIVES, PAVING, WALLS, FINISHES, AND OTHER FACILITIES DAMAGED IN THE COURSE OF THIS WORK. REPAIR MATERIALS SHALL MATCH EXISTING CONSTRUCTION. ALL BACKFILLING AND REPAIRING SHALL MEET ALL REQUIREMENTS OF THE OWNER, CITY AND OTHERS HAVING JURISDICTION. REPAIR WORK SHALL BE THOROUGHLY FIRST CLASS.

16A CUTTING AND PATCHING

FOLLOWING THE REQUIREMENTS IN DIVISION 1, CUT WALLS, FLOORS, CEILING, AND OTHER PORTIONS OF THE FACILITY AS REQUIRED TO PERFORM WORK UNDER THIS DIVISION. OBTAIN PERMISSION OF THE ENGINEER, OWNER, OR BOTH, BEFORE DOING ANY CUTTING. CUT ALL HOLES AS SMALL AS POSSIBLE. PATCH WALLS, FLOORS, AND OTHER PORTIONS OF THE FACILITY AS REQUIRED BY WORK UNDER THIS DIVISION. ALL PATCHING SHALL BE THOROUGHLY FIRST CLASS AND SHALL MATCH THE ORIGINAL MATERIAL AND CONSTRUCTION, INCLUDING FIRE RATINGS IF APPLICABLE.

16A ROUGH-IN

COORDINATE WITHOUT DELAY ALL ROUGHING-IN WITH OTHER DIVISIONS. CONCEAL ALL RACEWAYS EXCEPT IN UNFINISHED AREAS AND WHERE OTHERWISE INDICATED ON THE DRAWINGS.

16A SUPPORT SYSTEMS

1. STEEL SLOTTED SUPPORT SYSTEMS (SLOTTED CHANNEL): COMPLY WITH MFMA-3, FACTORY-FABRICATED COMPONENTS FOR FIELD ASSEMBLY; 12-GAUGE, 1-5/8-INCH BY 1-5/8-INCH; COOPER B-LINE, ERICO INTERNATIONAL CORPORATION, HILTI, INC., POWER-STRUT, THOMAS & BETTS CORPORATION, UNISTRUT.

FINISHES:

A. METALLIC COATINGS: HOT-DIP GALVANIZED AFTER FABRICATION AND APPLIED ACCORDING TO MFMA-3.

B. NONMETALLIC COATINGS: MANUFACTURER'S STANDARD PVC, POLYURETHANE OR POLYESTER COATING APPLIED ACCORDING TO MFMA-3.

C. PAINTED COATINGS: MANUFACTURER'S STANDARD PAINTED COATING APPLIED ACCORDING TO MFMA-3.

2. ALUMINUM SLOTTED SUPPORT SYSTEMS (SLOTTED CHANNEL): COMPLY WITH MFMA-3, TYPE 6063-T6, PER ASTM B221; FACTORY-FABRICATED COMPONENTS FOR FIELD ASSEMBLY; 12-GAUGE, 1-5/8-INCH BY 1-5/8-INCH; COOPER B-LINE, ERICO INTERNATIONAL CORPORATION, HILTI, INC., POWER-STRUT, THOMAS & BETTS CORPORATION, UNISTRUT.

FIELD FABRICATION:

WHERE FIELD CUTTING OF STANDARD LENGTHS OF CHANNEL ARE REQUIRED, MAKE CUTS STRAIGHT AND PERPENDICULAR TO MANUFACTURED SURFACES.

FOR FIELD-CUT OR DAMAGED SURFACES OF COATED CHANNELS, DRESS CUT ENDS, DAMAGED SURFACES, OR BOTH, WITH AN ABRASIVE MATERIAL (E.G., FILE, CRUISING STONE, OR SIMILAR) AND CLEANER TO REMOVE OILS, RUST, SHARP EDGES AND SHARPS.

FOR CHANNEL WITH A FACTORY-APPLIED COATING, RE-FINISH CUT EDGES WITH A COATING COMPATIBLE WITH THE FACTORY FINISH AND AS RECOMMENDED BY THE MANUFACTURER (E.G., MANUFACTURER'S TOUCH-UP PAINT OR ZINC-RICH COLD-GALVANIZING COMPOUND, AS APPLICABLE).

16A PENETRATIONS

COORDINATE SLEEVE SELECTION AND APPLICATION WITH SECTION AND LOCATION OF FIRE-STOPPING SPECIFIED IN DIVISION 1 THROUGH PENETRATION FIRESTOP SYSTEMS.

ROOFS:

COORDINATE ALL ROOF PENETRATIONS WITH ENGINEER, OWNER, AND APPLICABLE, THE ROOFING CONTRACTOR PROVIDING THE ROOF WARRANTY.

KEEP ALL RACEWAY PENETRATIONS WITHIN MECHANICAL EQUIPMENT CEILING WHEREVER POSSIBLE. COORDINATE WITH DIVISION 15 WORK.

FLASH AND CONTOURFLASH OPENINGS THROUGH ROOFING OR PROVIDE PRE-FABRICATED MOLDED SEALS COMPATIBLE WITH THE ROOFING STRUCTURE INSTALLED, OR AS REQUIRED BY THE ENGINEER, OWNER OR ROOFING CONTRACTOR. ALL ROOF PENETRATIONS SHALL BE LEAKTIGHT AT THE TERMINATION OF THE WORK AND SHALL NOT VOID ANY NEW OR EXISTING ROOF WARRANTIES.

WALLS AND FLOORS:

SEALS FOR RACEWAYS AND CABLES:

1. GULF STEEL SLEEVE: ASTM A 53/A 53M, TYPE E, GRADE B, SCHEDULE 40, GALVANIZED STEEL, PLAIN ENDS AND DRIP RINGS.

2. CAST-IRON PIPE SLEEVES: CAST OR FABRICATED "WALL PIPE," EQUIVALENT TO DUCTILE-IRON PRESSURE PIPE, WITH PLAIN ENDS AND INTEGRAL WATERSTOP, UNLESS OTHERWISE INDICATED.

SLEEVES FOR RECTANGULAR OPENINGS: GALVANIZED SHEET STEEL WITH MINIMUM 0.138 INCH THICKNESS AND OF WIDTH AND LENGTH TO SUIT APPLICATION.

16A FIRE-STOPPING THROUGH PENETRATIONS

FIRE-RESISTANT THROUGH PENETRATION SEALANTS: TWO-PART, FOAMED-IN-PLACE, SILICONE SEALANT FORMULATED FOR USE IN THROUGH-PENETRATION FIRE-STOPPING AROUND CABLES, RACEWAYS, AND CABLE TRAY PENETRATIONS THROUGH FIRE-RATED WALLS AND FLOORS. SEALANTS AND ACCESSORIES SHALL HAVE FIRE-RESISTANCE RATINGS INDICATED, AS ESTABLISHED BY TESTING IDENTICAL ASSEMBLIES IN ACCORDANCE WITH ASTM E 814, BY UNDERWRITERS' LABORATORIES, INC., OR OTHER WTRIL ACCEPTABLE TO AHJ.

ACCEPTABLE MANUFACTURERS:

HILTI, INC.
3M CORP.
RECTORSEAL
SPECTRY TECHNOLOGY INC.
UNITED STATES GYPSUM COMPANY.

SUBMITTALS

SUBMIT PRODUCT DATA, MANUFACTURER'S SPECIFICATIONS AND TECHNICAL DATA FOR EACH MATERIAL INCLUDING THE COMPOSITION AND LIMITATIONS, DOCUMENTATION OF FIRESTOPPING TO BE USED AND MANUFACTURER'S INSTALLATION INSTRUCTIONS TO COMPLY WITH DIVISION 1.

MANUFACTURER'S ENGINEERING JUDGMENT IDENTIFICATION NUMBER AND DRAWING DETAILS WHEN NO UL SYSTEM IS AVAILABLE FOR AN APPLICATION. ENGINEERING JUDGMENT SHALL INCLUDE BOTH PROJECT NAME AND CONTRACTOR'S NAME WHO WILL INSTALL FIRESTOP SYSTEM AS DESCRIBED IN DRAWINGS.

SUBMIT MATERIAL SAFETY DATA SHEETS PROVIDED WITH PRODUCT DELIVERED TO JOB-SITE.

16A CONCRETE BASES

PROVIDE CONCRETE BASES (E.G., HOUSEKEEPING PADS) FOR EQUIPMENT WHERE INDICATED ON THE DRAWINGS AND AS SPECIFIED HEREIN. CONCRETE BASES SHALL HAVE CHAMFERED EDGES. SIZE OF BASE SHALL BE A MINIMUM OF 2 INCHES GREATER THAN THE FOOTPRINT OF THE EQUIPMENT THAT IT IS SUPPORTING.

CONSTRUCT EQUIPMENT BASES OF A MINIMUM 28-DAY, 4000-PSI CONCRETE CONFORMING TO AMERICAN CONCRETE INSTITUTE STANDARD BUILDING CODE FOR REINFORCED CONCRETE (ACI 318-98) AND THE LATEST APPLICABLE RECOMMENDATIONS OF THE ACI STANDARD PRACTICE MANUAL. CONCRETE SHALL BE COMPOSED OF CEMENT CONFORMING TO ASTM C 150 TYPE I, AGGREGATE CONFORMING TO ASTM C33, AND POTABLE WATER. EXPOSED EXTERIOR CONCRETE SHALL CONTAIN 5 TO 7 PERCENT AIR ENTRAINMENT.

UNLESS OTHERWISE SPECIFIED OR SHOWN ON THE STRUCTURAL DRAWINGS, REINFORCE EQUIPMENT BASES WITH NO. 4 REINFORCING BARS CONFORMING TO ASTM A 615 OR #4 W2.9 X W2.9 WELDED WIRE MESH CONFORMING TO ASTM A185. PLACE REINFORCING BARS 24 INCHES ON CENTER WITH A MINIMUM OF TWO BARS EACH DIRECTION.

PROVIDE GALVANIZED ANCHOR BOLTS FOR EQUIPMENT PLACED ON CONCRETE BASES OR ON CONCRETE SLABS. ANCHOR BOLTS SIZE, NUMBER AND PLACEMENT SHALL BE AS RECOMMENDED BY THE MANUFACTURER OF THE EQUIPMENT.

CONCRETE EQUIPMENT BASES SHALL HAVE A MINIMUM HEIGHT OF 4 INCHES AND SHALL BE POURED-IN-PLACE.

16A ACCESS DOORS

PROVIDE ACCESS DOORS IN CEILING AND WALLS, WHERE INDICATED OR REQUIRED FOR ACCESS OR MAINTENANCE TO CONCEALED EQUIPMENT INSTALLED UNDER THIS SECTION. PROVIDE CONCEALED HINGES, SCREWDRIVER-TYPE LOCK, AND ANCHOR STRAPS.

MANUFACTURED BY MILCOR, ZURN, TITUS, OR EQUAL. OBTAIN ARCHITECT'S APPROVAL OF TYPE, SIZE, LOCATION AND COLOR BEFORE ORDERING.

16A EQUIPMENT FURNISHED BY OTHERS

PROVIDE NECESSARY EQUIPMENT AND ACCESSORIES THAT ARE NOT PROVIDED BY THE EQUIPMENT SUPPLIER OR OWNER TO COMPLETE INSTALLATION OF EQUIPMENT FURNISHED BY OTHERS, IN LOCATIONS AS INDICATED ON THE DRAWINGS, SPECIFIED HEREIN, OR BOTH. EQUIPMENT AND ACCESSORIES NOT PROVIDED BY THE EQUIPMENT SUPPLIER MAY INCLUDE SUCH ITEMS AS FLEXIBLE CORDS AND PLUGS, AS REQUIRED FOR PROPER OPERATION OF THE COMPLETE SYSTEM, IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.

BE RESPONSIBLE FOR CORRECT ROUGH-IN DIMENSIONS, AND VERIFY THEM WITH ENGINEER, OWNER'S REPRESENTATIVE, EQUIPMENT SUPPLIER, OR ALL THREE PRIOR TO ROUGH-IN AND SERVICE INSTALLATIONS.

16A CLEANING

IN ADDITION TO THE REQUIREMENTS OF DIVISION 1, REMOVE FROM THE PREMISES DIRT AND REFUSE RESULTING FROM THE PERFORMANCE OF THE ELECTRICAL WORK, AS REQUIRED, TO PREVENT ACCUMULATION. COOPERATE IN MAINTAINING REASONABLY CLEAN PREMISES AT ALL TIMES. IMMEDIATELY PRIOR TO INSPECTION, MAKE A FINAL CLEANUP OF DIRT AND REFUSE RESULTING FROM THE WORK. CLEAN ALL MATERIAL AND EQUIPMENT UNPAID UNDER THIS DIVISION. REMOVE DIRT, DUST, PLASTER, STAINS AND FOREIGN WATER FROM ALL SURFACES. TOUCH UP AND RESTORE ALL DAMAGED FINISHES TO THEIR ORIGINAL CONDITION.

16A ADJUSTING, ALIGNING AND TIGHTENING

ADJUST, ALIGN, AND TEST ALL ELECTRICAL EQUIPMENT ON THIS PROJECT PROVIDED UNDER THIS DIVISION AND ALL ELECTRICAL EQUIPMENT FURNISHED BY OTHERS FOR INSTALLATION AND WIRING UNDER THIS DIVISION, FOR PROPER OPERATION.

TEST ALL SYSTEMS AND EQUIPMENT ACCORDING TO THE REQUIREMENTS IN NETA IATS (LATEST EDITION) AND ALL ADDITIONAL REQUIREMENTS SPECIFIED IN FOLLOWING SECTIONS.

MAINTAIN THE FOLLOWING ON THE PROJECT PREMISES AT ALL TIMES: A TRUE RMS READING VOLTMETER, A TRUE RMS READING AMPMETER, AND A MEGOHMMETER INSULATION RESISTANCE TESTER. PROVIDE TEST DATA READINGS AS REQUESTED AS REQUIRED BY THE ENGINEER.

16A EQUIPMENT IDENTIFICATION

PROVIDE EQUIPMENT IDENTIFICATION NAMEPLATES:

ON ALL PANELBOARDS, SWITCHES, STARTERS, DIMMERS, SWITCHES IN DISTRIBUTION PANELBOARDS AND SWITCHBOARDS.