

DIVISION 16

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DIVISION 16 ELECTRICAL

16010 GENERAL PROVISIONS

.01 EXCEPT WHERE PORTIONS OF THESE SPECIFICATIONS ARE MORE EXACTING, WORK OF THIS DIVISION SHALL COMPLY WITH ALL APPLICABLE PROVISIONS OF THE GENERAL SCOPE OF WORK. BEFORE SUBMITTING PROPOSAL, EXAMINE ALL DRAWINGS RELATING TO THIS WORK, VERIFY ALL GOVERNING CONDITIONS AT THE SITE, DETERMINE EXACT EXTENT OF WORK REQUIRED FOR THE LOCAL UTILITY COMPANIES; BECOME FULLY INFORMED AS TO THE EXTENT AND CHARACTER OF THE WORK REQUIRED AND ITS RELATION TO WORK OF OTHER TRADES. NO CONSIDERATION WILL BE GRANTED FOR ANY ALLEGED MISUNDERSTANDINGS OF THE MATERIALS TO BE FURNISHED OR WORK TO BE DONE, IT BEING UNDERSTOOD THAT THE SUBMISSION OF A PROPOSAL IS AN AGREEMENT TO ALL CONDITIONS REFERRED TO HEREIN OR INDICATED ON THE DRAWINGS.

.02 REVIEW THE DRAWINGS AND SPECIFICATIONS OF ALL TRADES, PARTICULARLY THOSE SECTIONS DESCRIBING ELECTRICALLY OPERATED EQUIPMENT AND BECOME FAMILIAR WITH WORK CALLED UPON THEREIN TO DO, AT THE CONCLUSION OF THE WORK, BE RESPONSIBLE FOR THE PROPER WIRING AND FUNCTIONING OF ALL ELECTRICALLY OPERATED EQUIPMENT FURNISHED AND/OR INSTALLED UNDER THIS CONTRACT.

.03 NO EXTRA COMPENSATION WILL BE PAID FOR CONDITIONS EXISTING BEFORE THE CONTRACT IS SIGNED, THIS INCLUDES BOTH EXISTING SITE CONDITIONS AND ARCHITECTURAL CONDITIONS OF THE NEW BUILDING.

.04 THE CONTRACTOR SHALL OBTAIN ALL PERMITS FOR HIS WORK UNDER THE CONTRACT, AND SHALL PAY ALL EXPENSES IN CONNECTION THEREWITH. HE SHALL BE RESPONSIBLE FOR ALL NOTICE TO THE INSTALLATION AUTHORITIES AND TO THE ARCHITECT/ENGINEER SO THAT THE WORK MAY BE INSPECTED BEFORE COVERING. THE CONTRACTOR SHALL FURNISH OWNER WITH CERTIFICATES OF INSPECTION.

.05 NO DEVIATION FROM DRAWING AND/OR SPECIFICATIONS SHALL BE PERMITTED WITHOUT WRITTEN APPROVAL FROM ARCHITECT/ENGINEER.

.06 ALL PERMIT FEES, TEMPORARY SERVICE, INSPECTION FEES AND OTHER REQUIREMENTS SHALL BE PAID AND COMPLETED BY THE ELECTRICAL CONTRACTOR. EVIDENCE OF COMPLETION WILL BE APPARENT PRIOR TO FINAL ACCEPTANCE OF WORK. ALL CERTIFICATES SHALL BE FORWARDED TO OWNER.

.07 THE WORK OF THIS CONTRACTOR SHALL CONSIST OF FURNISHING EVERYTHING NECESSARY FOR A COMPLETE OPERATING ELECTRICAL SYSTEM, IN STRICT ACCORDANCE WITH THE DRAWINGS AND SPECIFICATIONS. IT INCLUDES ALL SUCH WORK WHETHER LISTED UNDER ANY OTHER DOCUMENT FORMING A PART OF THE SPECIFICATION AND CONTRACT, HIS WORK, IN THE MAIN, SHALL INCLUDE, BUT IS NOT RESTRICTED TO, THE FOLLOWING ITEMS:

- A. FURNISHING A TEMPORARY SERVICE FOR THE USE OF ALL TRADES DURING CONSTRUCTION, AS REQUIRED BY THE GENERAL CONTRACTOR. GENERAL CONTRACTOR SHALL PAY UTILITY COSTS UP TO TIME OF OCCUPANCY.
B. FURNISHING A COMPLETE ELECTRICAL DISTRIBUTION SYSTEM FOR LIGHT AND POWER, FROM POINT OF SERVICE THROUGH DISTRIBUTION SYSTEM TO PANELS, AND TO ALL ELECTRICAL EQUIPMENT AND DEVICES AS INDICATED ON THE DRAWINGS.
C. ELECTRICAL CONNECTIONS FOR OTHER TRADES.
D. CONNECTION OF ALL MOTORS, STARTERS, CONTROLS, PILOT DEVICES OR DISCONNECTS, WHETHER FURNISHED BY THIS CONTRACTOR, OWNER, OTHER SUBCONTRACTOR OR OTHER PARTIES SUCH AS EQUIPMENT SUPPLIER.
E. ALL ELECTRICAL WORK INSTALLED TO OTHER TRADES FOR A COMPLETE WORKING INSTALLATION OF THEIR ELECTRICALLY DRIVEN EQUIPMENT.
F. FURNISHING AND INSTALLING ALL CONDUCTORS AND RACEWAYS FOR ELECTRICAL EQUIPMENT.
G. FURNISHING, INSTALLING AND LAMPING OF ALL FLOODLIGHTS, FLOODLIGHT POLES AND LIGHTING FIXTURES AS SCHEDULED ON THE DRAWINGS AND IN ACCORDANCE WITH ARCHITECTURAL DETAILS, FURNISHING ALL LAMPS, FLUORESCENT, H.I.D., AND INCANDESCENT.

H. CONNECTING OF ALL AIR CONDITIONING, HEATING, PUMPING, VENTILATION AND EXHAUST FAN CONTROLS AS SPECIFICALLY CALLED FOR ON THE DRAWINGS AND SPECIFIED HEREIN.

I. TEMPORARY AND EMERGENCY WIRING AS REQUIRED.
J. FURNISHING AND INSTALLING ALL AUXILIARY AND COMMUNICATION SYSTEMS AS INDICATED ON THE DRAWINGS.
K. FURNISHING AND INSTALLING ALL PANELS, METERS, ETC., AS SHOWN ON THE DRAWINGS.

L. FURNISH AND INSTALL TRANSFORMERS FOR ALL EQUIPMENT WHETHER FURNISHED BY THIS CONTRACTOR, THE OWNER, OR OTHER PARTIES, WHERE SUCH EQUIPMENT HAS A VOLTAGE RATING UNSUITABLE TO THE SYSTEM IN WHICH IT IS APPLIED.
M. SHOP DRAWINGS: SUBMIT, AT ONE TIME, SHOP AND DETAIL DRAWINGS, FACTORY CERTIFIED PRINTS AND MATERIALS LISTS FOR THE FOLLOWING ITEMS: PANELBOARDS, SAFETY SWITCHES, WIRING DEVICES, LIGHTING FIXTURES. ALL SUBMITTALS MUST BE IDENTIFIED BY SPECIFICATION SECTION AND PARAGRAPH NUMBER AND/OR DRAWING NUMBER AND SCHEDULED NUMBER AND NAME ALONG WITH THE MANUFACTURE'S NAME.

N. MANUALS AND CHARTS: FURNISH OWNER ALL OPERATING INSTRUCTIONS, MAINTENANCE INSTRUCTIONS, LITERATURE AND INFORMATION PERTAINING TO ALL EQUIPMENT.

16012 CODES AND STANDARDS

.01 THE WORK PERFORMED SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRIC CODE. NOTHING CONTAINED IN THESE SPECIFICATIONS OR DRAWINGS SHALL BE SO CONSTRUED AS TO CONFLICT WITH ANY LOCAL, MUNICIPAL, STATE, UTILITY COMPANY AND NATIONAL BOARD OF FIRE UNDERWRITERS REGULATIONS GOVERNING THE INSTALLATION OF THE WORK SPECIFIED HEREIN. ALL SUCH LAWS, ORDINANCES, AND REGULATIONS, WHERE THEY APPLY TO THIS WORK, ARE HEREBY INCORPORATED INTO AND MADE A PART OF THESE SPECIFICATIONS. ALL SUCH REQUIREMENTS SHALL BE SATISFIED AT NO ADDITIONAL EXPENSE TO THE OWNER.

16020 ELECTRICAL SYSTEMS SCHEDULE

.01 REFER TO THE DRAWINGS FOR AIR CONDITIONING WIRING DIAGRAM, PANEL BOARD SCHEDULE, RISER DIAGRAM, EQUIPMENT SCHEDULE, ELECTRICAL SYSTEMS REQUIREMENTS, ETC.

16030 TESTS

.01 PROVIDE ALL NECESSARY INSTRUMENTS AND SPECIAL APPARATUS TO CONDUCT ANY TEST THAT MAY BE REQUIRED TO WHICH THERE ARE UNDERWRITERS' LABORATORIES' STANDARD SHORT CIRCUITS AND THAT ALL FEEDERS ARE PROPERLY BALANCED. THE SYSTEM INSTALLED SHALL BE CHECKED FOR QUALITY, CAPACITY AND COMPLETENESS TO CONFORM WITH THE FULL REQUIREMENTS AND INTENT OF THE DRAWINGS AND SPECIFICATIONS.

16100 BASIC METHODS AND MATERIALS

.01 ELECTRICAL MATERIALS, APPLIANCES, EQUIPMENT DEVICES FOR WHICH THERE ARE UNDERWRITERS' LABORATORIES' STANDARD REQUIREMENTS SHALL HAVE LABELS ATTACHED TO INDICATE COMPLIANCE WITH THOSE REQUIREMENTS. WHERE MATERIALS DO NOT BEAR SUCH A LABEL, CERTIFICATE OF COMPLIANCE SHALL BE FURNISHED.
.02 ALL MATERIALS SHALL BE NEW AND OF FIRST QUALITY, FREE OF DEFECTS.
.03 SUBMIT MANUFACTURER'S DATA AND CATALOG CUTS ON ALL ITEMS INCLUDED IN THIS SECTION PRIOR TO COMMENCING WORK.

16110 RACEWAYS

.01 ALL CONDUCTORS SHALL BE CONTAINED IN RACEWAYS.
.02 ALL CONDUIT RACEWAYS IN OR BELOW FLOOR SLAB AND RUN BELOW EXTERIOR FINISHED GRADE SHALL BE PVC. EXCEPT FOR ELLS AND RISERS WHICH SHALL BE RIGID GALVANIZED CONDUIT. CONDUIT RISERS SHALL RUN UP 6" ABOVE GROUND FLOOR SLAB WHEN CONCEALED AND 48" ABOVE GROUND FLOOR SLAB WHEN EXPOSED ON WALL. ALL RIGID GALVANIZED CONDUIT RUN BELOW SLAB OR FINISHED EXTERIOR GRADE SHALL BE PAINTED WITH TWO (2) COATS OF BITUMASTIC PAINT. THIS PAINTING SHALL BE APPLIED TO CONDUIT UP TO A ABOVE FLOOR SLAB. CONDUITS RUN BELOW FLOOR SLAB SHALL HAVE A MINIMUM COVER OF 1" AND THE RUN BELOW EXTERIOR FINISHED GRADE SHALL HAVE A MINIMUM COVER OF 24" IN NON-VEHICULAR TRAFFIC AREAS AND 36" IN VEHICULAR TRAFFIC AREAS. INSTALLATION OF P.V.C. CONDUIT IN TRENCHES SHALL HAVE 2" MIN. CLEAN AND FILL. ALL CONDUIT SHALL BE BACKFILLED WITH CLEAN BACKFILL TO ROUGH LARGER THAN 1/4" DIA. (PIESTER). CONTRACTOR SHALL EXTERIOR TRENCHES TO WITHIN 6" OF TOP (FINISHED GRADE) THEN LAY A YELLOW RIBBON TAPE AND IN INDUSTRY FOR THIS PURPOSE) ALONG TRENCH, THEN WITH BACKFILL.
.03 RIGID CONDUIT SHALL BE HOT-DIPPED GALVANIZED, INCLUDING THREADS. P.V.C. SHALL BE SCHEDULE 40.
.04 FLEXIBLE METALLIC CONDUIT (GREENFIELD) SHALL BE USED FOR ALL CONNECTIONS TO MOTORS AND VIBRATING EQUIPMENT, BUT IN LENGTHS NOT TO EXCEED LAST 18" OF RUN. P.V.C. JACKETED FLEXIBLE METAL CONDUIT SHALL BE USED IN ALL EXPOSED LOCATIONS.
.05 ELECTRICAL METALLIC TUBING (EMT) MAY BE USED FOR ALL PURPOSES EXCEPT AS INDICATED ABOVE. ALL FITTINGS SHALL BE STEEL.
.06 ALL RACEWAYS SHALL BE RUN CONCEALED IN FINISHED AREAS UNLESS NOTED.
.07 WHERE EXPOSED RACEWAYS ARE ALLOWED OR INDICATED, THEY SHALL PRESENT A NEAT APPEARANCE, AND ALL RUNS BOTH EXPOSED AND CONCEALED SHALL BE PARALLEL OR PERPENDICULAR TO THE BUILDING LINES AND TO EACH OTHER WITHOUT INTERFERENCE WITH OTHER TRADES OR EQUIPMENT. SUPPORTS TO BE ONE (1) HOLE CAST STRAPS, KINDORF OR EQUAL SURFACE OR TRAPEZE HANGERS, SPLIT HANGERS WITH APPROPRIATE ROD HANGERS AND FITTINGS, NO PERFORATED STRAP IRON.
.08 ALL RACEWAYS SHALL LAY FLAT TO RUNNING SURFACES AND SHALL BE OFFSET WHERE ENTERING BOXES, ETC.
.09 DURING CONSTRUCTION, ALL OPEN ENDS OF CONDUIT SHALL BE KEPT PLUGGED OR CAPPED. USE T&B 1470 SERIES PLUGS.

16120 CONDUCTORS

.01 ALL CONDUCTORS SHALL BE MINIMUM 98 % CONDUCTIVITY COPPER.
.02 ALL WIRE AND CABLE SHALL HAVE INSULATION TYPE AS LISTED BELOW.
.03 ALL BRANCH CIRCUIT AND FEEDER WIRING SHALL BE COLOR CODED THROUGHOUT. (SEE GENERAL NOTES ON DRAWINGS)
.04 NO WIRE SMALLER THAN #12 SHALL BE USED EXCEPT FOR CONTROL WIRING.
.05 BRANCH CIRCUIT RUNS LONGER THAN 100 FEET FROM PANEL TO FIRST OUTLET SHALL BE RUN WITH #10 WIRE.
.06 ALL INSULATION SHALL BE RATED FOR 600V UNLESS OTHERWISE NOTED.
.07 PARTICULAR CARE SHALL BE EXERCISED IN THE JOINING OF THE BRANCH CIRCUIT COMMON NEUTRALS.
.08 CONDUCTOR TYPES:
A. COMBINATION TYPE "THHN/THWN" FOR GENERAL USE.
B. TYPE "THW" FOR THE USE IN ALL SIZES #6 AND ABOVE.
C. BRANCH CIRCUIT WIRE MAY BE RUN IN FUTURE CHANNELS (FLOOR).
D. ALUMINUM CONDUCTORS NOT ALLOWED ON THIS PROJECT.
.09 CONDUCTOR INSTALLATION SIZES:
A. SIZES SHOWN ON DRAWINGS ARE MINIMUM AND SHALL NOT BE DECREASED UNDER ANY CIRCUMSTANCES.
B. CHANGES IN EQUIPMENT FURNISHED BY OTHERS MAY REQUIRE CHANGES IN CONDUCTOR SIZES; IN SUCH CASE, THE CONTRACTOR SHALL NOTIFY THE OWNER.
C. BRANCH CIRCUITS SHALL BE INSTALLED AS INDICATED ON THE DRAWINGS. CONDUCTOR SIZES SHALL BE AS NOTED IN THE EQUIPMENT SCHEDULES AND/OR PANEL LISTINGS.
D. CONDUCTORS USED FOR WIRING OF MOTOR CONTROLS MAY BE #14 AWG UNLESS NOTED ON PLANS.

.10 CONDUCTORS INSTALLATION JOINTS:
A. JOINTS, BRANCH CIRCUIT SPLICES SHALL UTILIZE (SCOTCH LOCKS) WIRE NUTS.
B. NO JOINTS OR TAPS WILL BE ALLOWED IN FEEDER RUNS, EXCEPT IN JUNCTION OR PULL BOXES.
C. ALL FEEDER SPLICES AND TERMINATION SHALL BE MADE MECHANICALLY USING COMPRESSION TYPE SLEEVES OR LUGS AND CONNECTION TO PANELS AND SWITCHES. BURNDY OR T&B (HYPRESS) EQUIPMENT IS APPROVED - HYLINK - HYLUG.
D. INSULATION RESISTANCE OF JOINTS SHALL BE EQUAL TO OR GREATER THAN THAT OF THE CONDUCTORS JOINED. COVERING SHALL BE SCOTCH #33 TAPE OVER HALF-LAPPED COVERING OF RUBBER TAPE.

.11 CONDUCTORS INSTALLATION METHODS:
A. NO CONDUCTORS SHALL BE INSTALLED UNTIL ALL ROUGH WORK BY OTHER TRADES IS IN PLACE AND ROOF DECKS ARE IN PLACE.
B. AT EACH OUTLET, A LOOP OF WIRE NOT LESS THAN 6 INCHES IN LENGTH SHALL BE LEFT FOR CONNECTION TO FIXTURE, AND/OR OTHER DEVICES.
C. ALL CONDUCTORS SHALL BE CONTAINED IN RACEWAYS.
D. ALL RACEWAYS SHALL BE THOROUGHLY DRYBROED OUT TO REMOVE MOISTURE BEFORE WIRING OR CAPPING ARE DRAWN INTO PLACE.

.12 UNDERLAB SERVICE: ELECTRICAL CONDUIT SHALL BE BELOW THE "DINING ROOM" TO BE EXTERIOR SHALL BE LAPPED OR PLACED LOW ENOUGH IN THE CONCRETE FLOOR SLAB TO AVOID DAMAGE BY CUTTING DRILLING FOR SEATING VENTILATION. SEE INTERIOR DESIGN DRAWINGS.
.13 ALL FLOOR CONDUITS SHALL CONTAIN ALL GREEN EQUIPMENT CONDUIT WIRE AS REQUIRED.

16130 OUTLET BOXES AND DEVICES

.01 ALL WIRING DEVICES SHALL BE FURNISHED IN ACCORDANCE WITH DRAWINGS. SWITCH PLATES ARE TO BE PLASTIC WITH FINISH TO MATCH DEVICE EXCEPT STAINLESS STEEL SHALL BE USED IN RESTROOMS (WOMEN'S AND MEN'S), KITCHEN, & SIMILAR AREAS.
.02 OUTLET BOXES SHALL BE GALVANIZED STAMPED STEEL, FOUR (4) INCHES SQUARE, 1-1/2 INCHES DEEP, STEEL CITY #52151 FOR GENERAL USE. LARGER BOXES SHALL BE USED WHERE REQUIRED TO PREVENT UNDOE CROWDING OF WIRES. CONDUIT OFFICE GALVANIZED STEEL CITY #4 SHALL BE USED FOR MULTIPLE SWITCH ASSEMBLIES. SIZE AND DEPTH SHALL BE AS REQUIRED BY NATIONAL ELECTRIC CODE AND AS REQUIRED BY THE SPECIFIC DEVICES. BOX COVERS AND PLASTER RISERS ARE TO BE USED WHERE REQUIRED TO INSURE ASSEMBLY FINISHING FLUSH WITH SURFACE AREA.
A. WHERE EXPOSED WIRING IS DONE, CROUSE-HINDS FS BOXES WITH DS SERIES COVERS SHALL BE USED WHERE EXPOSED TO WEATHER, OTHERWISE FOUR (4) INCH BOXES AND FINISH COVERS.
B. SIZES SHOWN ABOVE ARE MINIMUM ONLY AND SHALL BE INCREASED WHERE NECESSARY DUE TO THE SIZE OF THE DEVICES TO BE CONTAINED.
C. SYMBOLS ON DRAWINGS INDICATE APPROXIMATE LOCATIONS ONLY UNLESS EXACT LOCATIONS ARE SPECIFIED ON THE PLANS, VERIFY LOCATIONS WITH ARCHITECTURAL DETAILS.
D. PROPERLY CENTER OUTLETS IN PANELING OR OTHER ARCHITECTURAL FEATURES AS INDICATED ON THE ARCHITECTURAL PLANS.
E. CLOSE TRIM AND CORNERS BY A MINIMUM OF FOUR (4) INCHES WHERE POSSIBLE.
F. MOUNT ALL BOXES SO THAT COVERS AND PLATES WILL MOUNT FLUSH WITH THE WALLS AND CEILING FINISHED PANELS.
G. FURNISH AND INSTALL PLASTER RINGS WHERE REQUIRED.
H. ALL FIXTURE OUTLETS SHALL BE EQUIPPED WITH "NO-BOLT" TYPE OF FIXTURE STUDS OF SUFFICIENT SIZE TO SUPPORT THE FIXTURE AND/OR DEVICE LOADS.
I. FIXTURE HANGING SYSTEMS TO BE ALL METALLIC.
J. CLOSE ALL OUTLETS DURING THE COURSE OF ROUGH CONSTRUCTION, CONCRETING AND PLASTERING WITH KRAFT PAPER, EXCELSION OR SLIP-ON BLANK METAL PLATES. THE USE OF NEWSPAPER IS NOT PERMISSIBLE FOR THIS PURPOSE.
K. HEIGHTS OF OUTLETS: UNLESS SPECIFICALLY NOTED OTHERWISE, ALL WALL OUTLETS SHALL BE MOUNTED AT THE FOLLOWING HEIGHTS, MEASURED FROM THE FINISHED FLOOR TO THE CENTER OF THE OUTLET BOX: SWITCHES-48 INCHES; RECEPTACLES-18 INCHES; TELEPHONE OUTLETS-12 INCHES. THE DIMENSIONS GIVEN ABOVE ARE TO BE USED TO COVER THE USUAL INSTALLATION DETAILS OF THE OUTLETS INVOLVED. HOWEVER, THE CONTRACTOR IS TO REFER TO ARCHITECTURAL AND EQUIPMENT DETAILS FOR THE EXACT LOCATION OF ALL OUTLETS BEFORE INSTALLATION OF SAME. MEASUREMENTS ON THE DRAWINGS, OWNER'S INSTRUCTIONS AND DETAIL MEASUREMENTS TAKE PRECEDENCE.

L. ALL WIRING DEVICES TO BE SPECIFICATION GRADE.
N. PROVIDE GASKETS ON W.P. COVERS AND BLANK PLATES.

16134 PANELBOARDS AND MAIN DISTRIBUTION

.01 PANEL CABINETS:
A. CABINETS SHALL BE CONSTRUCTED OF ZINC COATED SHEET STEEL IN ACCORDANCE WITH UL AND NEMA STANDARDS FOR CABINETS, BOXES AND ASSEMBLY.
B. A DIRECTORY HOLDER WITH GLASS COVER AND METAL FRAME SHALL BE FURNISHED ON THE INSIDE OF EACH DOOR. PANEL DIRECTORIES SHALL BE TYPED. HOLDER AND FRAME SHALL BE OF SUITABLE SIZE TO PROPERLY LIST CIRCUIT DESIGNATIONS. PROVIDE FLUSH, STAINLESS STEEL LOCK IN DOOR - DEAD FRONT PANEL COVERING BUS & CIRCUIT BREAKER ASSEMBLY TO BE ONE (1) PIECE.
C. PANELS SHALL BE INSTALLED AS INDICATED ON THE DRAWINGS.
.02 PANEL BOARDS AND CIRCUIT BREAKERS:
A. INDIVIDUAL CIRCUIT BREAKERS SHALL BE CALIBRATED AT THE FACTORY, SEALED TO PREVENT TAMPERING, SIZE AND FRAME AS INDICATED ON THE DRAWINGS.
B. MULTI-POLED BREAKERS SHALL BE OF THE COMMON TRIP TYPE. SIZE AND FRAME AS INDICATED ON THE DRAWINGS.
C. PROVIDE SHUNT TRIP ON MAIN CIRCUIT BREAKER WHERE REQUIRED BY LOCAL CODE.
D. ACCESSORIES SHALL BE FURNISHED AS INDICATED.
E. ALL BUSES SHALL BE AS PER MANUFACTURER'S STANDARD.
F. BRANCH BAR SHALL BE MOUNTED OPPOSITE THE MAIN BUS AND SHALL HAVE NUMBERED TERMINALS FOR CONNECTION. PROVIDE GROUND BUS AS CALLED FOR ON DRAWINGS.
.03 SAFETY SWITCHES:
A. SAFETY SWITCHES SHALL BE TYPE D, FUSIBLE OR NON-FUSIBLE AS INDICATED ON THE DRAWINGS. IN THE SIZES SHOWN, ENCLOSURES SHALL CONFORM TO LOCATION, (NEMA 1) INTERIOR, NEMA 12 (EXTERIOR).
B. ALL SWITCHES SHALL BE PROVIDED WITH THE NECESSARY NUMBER OF TERMINALS.
C. SWITCHES SHALL BE INSTALLED WHERE REQUIRED WHETHER SPECIFICALLY CALLED FOR OR OTHERWISE LOCATED.
D. WEATHERPROOF SAFETY SWITCHES MAY BE NEMA 3R EXTERIOR.
E. ACCEPTABLE MANUFACTURERS ARE: SQUARE "D", G.E., WESTINGHOUSE AND BUTLER-HAMMER.

.04 MARKING AND IDENTIFICATION:
A. ALL SWITCHES, PANELBOARDS, CONTROLLERS, CONTROL PANELS, LIGHT SWITCHES, CONTACTORS, TELEPHONE AND COMMUNICATION CABINETS SHALL BE CLEARLY AND PERMANENTLY LABELED IN A NEAT, ORDERLY AND SYSTEMATIC MANNER.
B. IDENTIFICATION SHALL CLEARLY DESIGNATE DEVICES AND EQUIPMENT AS TO USAGE.
C. PANELBOARDS AND CABINETS SHALL BE MARKED IN THE SAME DESIGNATION AS ON THE DRAWINGS USING WHITE LETTERS ON BLACK PLATES, SCREWED TO DOORS OR COVERS.
D. CONDUCTORS IN MULTIPLE CONDUCTOR RACEWAYS, GUTTERS, JUNCTION OR PULL BOXES, CABINETS AND SIMILAR LOCATIONS SHALL BE CLEARLY AND PERMANENTLY IDENTIFIED AS TO ELECTRICAL CHARACTERISTICS, SYSTEM DESIGNATION, SOURCE AND DESTINATION.
E. CONDUCTORS SHALL BE MARKED WITH PREPRINTED ADHESIVE MARKERS AS MANUFACTURED BY W.H. BRADY CO., OR THOMAS & BETTS.
F. WHERE PREPRINTED MARKERS ARE NOT AVAILABLE WITH THE PROPER DESIGNATION, 1-1/4 INCH DIAMETER PUNCHED BRASS DISCS SHALL BE USED.

16150 MOTORS AND CONTROLS
.01 WIRE TO AND CONNECT ALL ELECTRICALLY OPERATED EQUIPMENT.
.02 VERIFY PROPER ROTATION OF ALL ROTATING EQUIPMENT.
16190 SUPPORTING DEVICES
.01 REFER TO 16110.09 FOR EXPOSED RACEWAYS. CONCEALED RACEWAYS SHALL BE SUPPORTED USING SAME METHODS AS REQUIRED FOR EXPOSED RACEWAYS, EXCEPT THAT BRANCH CIRCUIT EMT IN CONCEALED LOCATIONS MAY BE SUPPORTED FROM BUILDING STRUCTURAL ELEMENTS WITH CADDY TYPE FITTINGS MANUFACTURED BY ERICO PRODUCTS CO., INC.
.02 OUTLET BOXES SHALL BE SUPPORTED TO BUILDING STRUCTURE USING THREADED LEAD ANCHORS AND MACHINE BOLTS, TOGGLE BOLTS, WOOD OR SHEET METAL SCREWS, IF PLACED DIRECTLY ON WOOD OR METAL SURFACE. TWO (2) ANCHORS ARE REQUIRED FOR EACH BOX. WHEN BOXES ARE LOCATED BETWEEN STRUCTURAL SUPPORTS, USE CADDY BOX SUPPORTS.
.03 ALL SUPPORTS, ANCHORS, BOLTS AND HARDWARE SHALL BE SIZED IN ACCORDANCE WITH MANUFACTURER'S PUBLISHED INFORMATION FOR THE SIZE AND WEIGHT OF THE SUPPORTED OBJECTS.

16450 GROUNDING

.01 REFER TO ELECTRICAL DRAWINGS AND DIAGRAMS FOR GROUNDING CONNECTIONS.
.02 THE CONDUIT SYSTEM AND THE NEUTRAL CONDUCTORS SHALL BE GROUNDED. FOLLOW REQUIREMENTS OF THE NATIONAL ELECTRIC CODE LATEST EDITION, NEUTRALS OF ALL TRANSFORMER SECONDARIES SHALL BE GROUNDED TO MINIMUM ONE (1) INCH COLD WATER PIPE.
.03 THE GROUND CONNECTION OF THE CONDUIT SYSTEM AND THE NEUTRAL CONDUCTORS SHALL BE MADE AT THE MAIN SERVICE PANELBOARD GROUND BUS.
.04 WHERE THREE (3) PHASE THREE (3) WIRE FEEDERS ARE EXTENDED TO UTILIZATION EQUIPMENT AND APPARATUS, A BONDING CONDUCTOR OF ADEQUATE SIZE, GREEN COLOR, SHALL BE USED TO GROUND THE EQUIPMENT FRAME. THE CONDUCTOR SHALL BE INSTALLED FROM GROUND BUS TO EQUIPMENT FRAME IN THE CIRCUIT RACEWAY.
.05 SEE GENERAL NOTES ON DRAWINGS.

16480 FEEDER CIRCUITS

.01 PROVIDE FEEDERS AS INDICATED ON THE DRAWINGS AND IN SCHEDULES.

16485 BRANCH CIRCUITS

.01 PROVIDE ALL WIRING AND CONNECTIONS TO OUTLETS AND FIXTURES AS INDICATED ON DRAWINGS AND IN SCHEDULES.

16500 LIGHTING - INTERIOR

.01 FURNISH AND INSTALL ALL LIGHTING FIXTURES CALLED FOR BY THE LIGHTING FIXTURE SCHEDULE ON THE SITE, EXTERIOR ELECTRICAL AND INTERIOR ELECTRICAL DESIGN DRAWINGS.
.02 EACH FIXTURE SHALL BE EQUIPPED WITH ANY REQUIRED MOUNTING FRAMES, HARDWARE AND ACCESSORY FASTENING ITEMS, FIXTURE MOUNTING FRAMES SHALL BE COMPATIBLE WITH CEILING CONSTRUCTION.
.03 EACH FIXTURE SHALL BE LAMPED WITH THE LAMP, WATTAGE TYPE AND WATTAGE INDICATED ON THE SCHEDULE.

16510 INTERIOR LIGHTING FIXTURES

.01 INSTALL AS INDICATED ON DRAWINGS ALL REFLECTED CEILING PLANS, DIMENSIONAL REFERENCE PRINTS AND TO ARCHITECTURAL DETAILS AND SCHEDULES.
.02 ALL INTERIOR FIXTURES (WHERE APPLICABLE) SHALL HAVE 100% VIRGIN ACRYLIC PNEUMATIC DIFFUSERS. POLYSTYRENE OR NYL WILL NOT BE ACCEPTABLE.
.03 SEE LIGHTING FIXTURE SCHEDULE AND NOTES ON ELECTRICAL DRAWINGS.

16600 SPECIAL SYSTEMS - COMPUTER (P.O.S. SYSTEM)

PROVIDE POWER WIRING AND OUTLETS FOR COMPUTER SYSTEM AS INDICATED ON THE DRAWINGS. COMPUTER CABLE INSTALLATION SHALL BE AS DIRECTED BY OWNER.

16700 SOUND SYSTEMS

.01 RACEWAYS, BACKBOARDS, OUTLET BOXES SHALL BE AS CALLED FOR ON DRAWINGS.
.02 PROVIDE NYLON PULLCORD IN ALL EMPTY RACEWAYS AND IDENTIFY PULLCORD ENDS.
.03 INTERIOR INSTRUMENTS AND WIRING BY OWNER CHOSEN COMMUNICATIONS CONTRACTOR.
.04 TELEPHONE SERVICE WIRING BY LOCAL TELEPHONE UTILITY.
.05 WHEN SHOWN ON DRAWINGS, THE CONTRACTOR SHALL PROVIDE AND INSTALL A 12" X 12" X 4" RECESSED TELEPHONE CABINET.
.06 PROVIDE BASIC MATERIALS CALLED FOR IN SECTION 16100.

16900 CONTROLS AND INSTRUMENTATION

.01 CONTROL WIRING DIAGRAMS ARE INDICATED ON DRAWINGS AND FURNISHED WITH EQUIPMENT. CONTRACTOR SHALL COORDINATE ALL WIRING WITH THESE DRAWINGS AND MANUFACTURER.
.02 ANY DISCREPANCY BETWEEN SYSTEM ELECTRICAL CHARACTERISTICS AND EQUIPMENT REQUIREMENTS ARE TO BE BROUGHT TO THE ATTENTION OF THE OWNER'S REP. FOR DECISION.

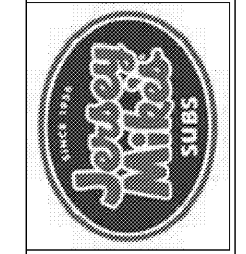
GENERAL NOTES:

- 1. PROVIDE AND PAY FOR ALL PERMITS AND INSPECTION FEES AS REQUIRED.
2. FURNISH ALL LABOR AND MATERIAL TO COMPLETE THE WORK AS SHOWN ON THE DRAWINGS. RECEPTACLES AND SWITCHES SHALL BE LEVITON OR AN APPROVED EQUAL. ALL WORK SHALL BE IN COMPLIANCE WITH ALL APPLICABLE CODES.
3. GENERAL CONTRACTOR SHALL PROVIDE AND INSTALL ALL NEW LIGHTING FIXTURES UNLESS OTHERWISE SPECIFIED ON THE DRAWINGS.

TELEPHONE AND CABLE TELEVISION

- 1. OWNER SHALL CONTRACT SEPARATELY WITH A TELEPHONE COMPANY. NUMBER AND LOCATION OF NEW TELEPHONE JACKS TO BE DETERMINED BY OWNER.
2. THE GENERAL CONTRACTOR SHALL COORDINATE HIS WORK WITH THAT OF THE TELEPHONE CONTRACTOR.

THE CONTENTS OF THIS DRAWING WILL REMAIN THE PROPERTY OF THOMAS F. TEDROW, AIA. ITS CONTENTS, INCLUDING ALL INFORMATION, SHALL NOT BE REPRODUCED USING ANY MEANS WITHOUT EXPRESSED WRITTEN CONSENT AND/OR PERMISSION FROM THOMAS F. TEDROW, AIA.



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Table with columns: REV. NO., DATE, DESCRIPTION. Includes project info: PROJECT NO. JMW-200, DRAWN BY: AK, CHECKED BY: AR, ISSUE DATE: 11/04/19, and ELECTRICAL SPECIFICATIONS.

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