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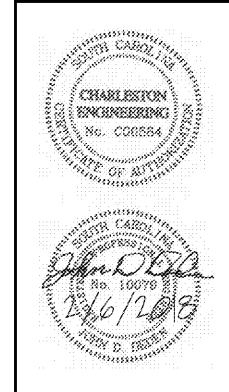
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Revisions:

ELECTRICAL
SPECIFICATIONS
E212

ELECTRICAL SPECIFICATIONS

PART 1 - GENERAL

- 1.01 SCOPE:
A. FURNISH AND INSTALL A COMPLETELY WIRED AND OPERATIONAL ELECTRICAL SYSTEM AS SHOWN ON THE DRAWINGS AND SPECIFIED HEREIN, INCLUDING BUT NOT LIMITED TO THESE MAJOR ITEMS:
1. LIGHTING FIXTURES AS INDICATED AND SPECIFIED ON PLANS.
2. ELECTRICAL PANELS, CONTROLS, SERVICE, DISCONNECTS, CONDUIT, WIRING, ETC., FOR ALL OUTLETS AND EQUIPMENT.
3. TELEPHONE/DATA OUTLETS AND CONDUIT AS INDICATED.
- 1.02 CODES, REGULATIONS AND STANDARDS:
A. THE INSTALLATION SHALL COMPLY WITH APPLICABLE LOCAL AND STATE CODES AND ORDINANCES, INCLUDING THE REGULATIONS OF THE FOLLOWING:
1. AMERICANS WITH DISABILITIES ACT - 1990 W/ 2008 AMENDMENT
2. INTERNATIONAL BUILDING CODE - 2012
3. NATIONAL ELECTRIC CODE - 2011
4. INTERNATIONAL ENERGY CONSERVATION CODE - 2009
5. LOCAL BUILDING CODES AND ORDINANCES
B. THE FOLLOWING INDUSTRY STANDARDS, SPECIFICATIONS ARE ALSO MINIMUM REQUIREMENTS:
1. THE NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION STANDARDS (NEMA).
2. THE MANUFACTURER'S RECOMMENDATION.
3. UNDERWRITER LABORATORIES INCORPORATED STANDARDS (UL).
4. AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI).
- 1.03 PERMITS
A. OBTAIN AND PAY FOR ALL REQUIRED PERMITS AND INSPECTION FEES.
- 1.04 INSPECTION OF SITE:
A. PRIOR TO SUBMITTING A BID, VISIT THE SITE OF THE PROPOSED CONSTRUCTION TO BECOME THOROUGHLY ACQUAINTED WITH EXISTING UTILITIES, WORKING CONDITIONS, ETC. ALLOWANCE WILL NOT BE MADE FOR NONCOMPLIANCE WITH THIS CONDITION AFTER BIDDING.
- 1.05 CLEAN-UP:
A. KEEP THE PREMISES FREE FROM ACCUMULATION OF WASTE MATERIAL, OR RUBBISH CAUSED BY EMPLOYEES OR WORK UNDER THIS DIVISION OF THE SPECIFICATION. AT THE COMPLETION OF THE WORK, REMOVE ALL SURPLUS MATERIALS, TOOLS, ETC., AND LEAVE THE PREMISES "BROOM-CLEAN". REMOVE ALL TEMPORARY WIRING UPON PROJECT COMPLETION.
- 1.06 DRAWINGS:
A. THE DRAWINGS INDICATE THE GENERAL ARRANGEMENT AND LOCATIONS OF THE ELECTRICAL WORK. DATA PRESENTED ON THESE DRAWINGS ARE AS ACCURATE AS PLANNING CAN DETERMINE, BUT FIELD VERIFICATION OF ALL DIMENSIONS, LOCATIONS, LEVELS, ETC., TO SUIT FIELD CONDITIONS IS REQUIRED. REVIEW ALL ARCHITECTURAL, STRUCTURAL AND MECHANICAL DRAWINGS AND ADJUST ALL WORK TO MEET THE REQUIREMENTS OF CONDITIONS SHOWN. THE ARCHITECTURAL DRAWINGS SHALL TAKE PRECEDENCE OVER ALL OTHER DRAWINGS. DISCREPANCIES BETWEEN DIFFERENT PLANS, OR BETWEEN DRAWINGS AND SPECIFICATIONS, OR REGULATIONS AND CODES GOVERNING THE INSTALLATION SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT IN WRITING BEFORE THE DATE OF BID OPENING. IF DISCREPANCIES ARE NOT REPORTED, IT IS THE GREATER QUANTITY OR BETTER QUALITY, AND APPROPRIATE ADJUSTMENTS WILL BE MADE AFTER CONTRACT AWARD. FIELD MEASURE AND CONFIRM MOUNTING HEIGHTS AND LOCATION OF ELECTRICAL EQUIPMENT WITH RESPECT TO COUNTERS, MECHANICAL EQUIPMENT, ETC. DO NOT SCALE DISTANCES OFF THE ELECTRICAL DRAWINGS; USE ACTUAL BUILDING DIMENSIONS.
B. IN ALL CASES SWITCHES CONTROLLING LIGHTING ARE TO BE LOCATED ON THE STRIKE SIDE OF DOORS. LOCATION INDICATED FOR SWITCHES AND OUTLETS ARE APPROXIMATE. OWNER MAY MAKE MINOR RELOCATIONS AT NO ADDITIONAL CHARGE.
C. SHOULD STRUCTURAL ELEMENTS PREVENT RUNNING OF CONDUITS, INSTALLATION OF OUTLETS OR CABINETS AS SHOWN ON THE DRAWINGS, THE NECESSARY MINOR CHANGE, AS DETERMINED BY THE ARCHITECT SHALL BE PERMITTED.
- 1.07 CUTTING AND FITTING:
A. PERFORM CORING, CUTTING, CHOPPING, FITTING, REPAIRING AND FINISHING OF THE WORK NECESSARY FOR THE INSTALLATION OF THE EQUIPMENT OF THIS SECTION. HOWEVER, NO CUTTING OF THE WORK OF OTHER TRADES OR OF ANY STRUCTURAL MEMBER SHALL BE DONE WITHOUT THE CONSENT OF THE ARCHITECT AND LANDLORD. PROPERLY FILL SEALS, FIREPROOF AND WATERPROOF ALL OPENINGS, SLEEVES, AND HOLES IN SLABS, FURNISH AND INSTALL ALL REQUIRED SLEEVES AND INSERTS.
- 1.08 COORDINATION WITH OTHER TRADES:
A. COOPERATE WITH OTHER TRADES SO THAT INSTALLATION OF ELECTRICAL PANELS AND EQUIPMENT WILL BE PROPERLY COORDINATED. CHECK CONDUIT ROUTURE, AND THE EQUIPMENT LOCATIONS WITH THE OTHER TRADES TO AVOID CONFLICT WITH THE PIPING, DUCTWORK, STEEL, PIPING, BEAMS, OR OTHER OBSTRUCTIONS.
B. CAREFULLY CHECK THE LOCATIONS OF THE OUTLET BOXES AND EQUIPMENT THAT HAVE NOT BEEN DISTURBED DURING THE INSTALLATION OF MATERIAL OF OTHER TRADES.
C. VERIFY ALL CIRCUITS FOR HVAC WITH MECHANICAL CONTRACTOR.
D. COORDINATE OUTLET LOCATIONS IN CABINETS.
- 1.09 UTILITY COMPANIES
A. COORDINATE INCOMING ELECTRICAL SERVICES WITH POWER AND TELEPHONE COMPANIES.

PART 2 - PRODUCTS AND EXECUTION

- 2.01 MATERIALS:
A. ALL MATERIAL SHALL BE NEW AND OF QUALITY AS SPECIFIED ON THE PLANS OR SPECIFICATIONS AND MUST CARRY THE UNDERWRITER'S LABORATORIES APPROVAL COVERING THE PURPOSE FOR WHICH THEY ARE USED, IN ADDITION TO MEETING ALL REQUIREMENTS OF THE CURRENT APPLICABLE CODES AND REGULATIONS.
- 2.02 CONDUIT:
A. RIGID GALVANIZED STEEL (RGS) MAY BE USED IN ALL AREAS. INTERMEDIATE METALLIC CONDUIT (IMC) MAY BE USED IN INDOOR LOCATIONS. USE ELECTRICAL METALLIC TUBING (EMT) IN INDOOR LOCATIONS NOT IN CONTACT WITH EARTH, NOT IN CONCRETE SLABS OR CONCRETE WALLS AND NOT SUBJECT TO DAMAGE. USE FLEXIBLE STEEL CONDUIT NOT EXCEEDING 36" FOR INDOOR FINAL CONNECTIONS TO MECHANICAL EQUIPMENT AND NOT EXCEEDING 72" AND RECESSED REMOVABLE FLUORESCENT LIGHT FIXTURES. USE LIQUID-TIGHT FLEXIBLE STEEL CONDUIT NOT EXCEEDING 36" FOR OUTDOOR FINAL CONNECTIONS TO EQUIPMENT OR IN WET LOCATIONS. USE SCHEDULE 40 PVC BELOW GRADE & IN SLAB.
B. WHERE THE CONDUIT ENTERS OUTLET BOXES, FIXTURES OR CABINETS, FIRMLY FASTEN BY DOUBLE LOCKNUTS AND BUSHINGS. FIRMLY FASTEN CONDUIT TO THE BUILDING CONSTRUCTION. RUN EXPOSED CONDUITS PARALLEL TO THE BUILDING LINES, SUPPORTED BY APPROPRIATE HANGERS (UNISTRUT, TAB OR APPLETON) FROM STRUCTURE. SUPPORT CONDUITS ON 5 FOOT INTERVALS AND WITHIN 3 FEET OF ANY BOX OR FITTING. DO NOT SUPPORT CONDUITS FROM CEILING, PIPING, CEILING SUPPORTS, DUCTWORK, OR OTHER CONDUITS.
C. CONDUIT CONNECTORS SHALL BE DOUBLE LOCKNUT TYPE, UL LISTED AND LABELED, WITH COMPRESSION FITTINGS.
D. CONDUIT SIZES SHALL BE AS REQUIRED BY CODE AND AS INDICATED OR SPECIFIED HEREIN. MINIMUM CONDUIT SIZE 1/2".
E. ALL EMPTY CONDUIT SYSTEMS SHALL HAVE 200 LB. TEST PULL CORD TO FACILITATE INSTALLATION OF FUTURE WIRE.
F. CONCEAL CONDUITS AND OUTLETS WITHIN THE BUILDING STRUCTURE; EXCEPT THAT CONDUITS MAY BE RUN EXPOSED AT PANELS AND ON CEILING. RUN CONDUIT SHOWN TO BE INSTALLED IN CABINETS, AND CASEWORK DIRECTED BY ARCHITECT.
- 2.03 OUTLET, PULL AND JUNCTION BOXES:
A. EACH SWITCH, LIGHT, RECEPTACLE OR OTHER OUTLETS SHALL BE PROVIDED WITH CODE GAUGE, GALVANIZED STEEL OUTLET BOX. JUNCTION AND PULLBOXES SHALL BE CODE GAUGE, GALVANIZED STEEL. OUTLET BOXES SHALL BE OF THE ONE PIECE LOCKOUT TYPE, IN GENERAL 4" SQUARE WITH PLASTER RING. PLASTER RINGS SHALL BE USED TO PROVIDE NOT MORE THAN 1/8" FROM WALL SURFACE TO RING. IN NO CASE SHALL PLASTER RING PROJECT BEYOND SURFACE OF WALL. SINGLE GANG RINGS SIMILAR TO STEEL CITY 52020 SHALL BE USED FOR BOXES IN UNFINISHED BRICK.
B. BOXES INSTALLED IN POURED CEMENT FLOORS SHALL BE FLUSH TYPE PVC WITH WATER TIGHT GASKETED COVERS, GRAY METALLIC EMERGENCY WHERE BOXES ARE INSTALLED IN FLOORS WITH TILE OR CARPET FLOOR COVERING; COVERS SHALL BE OF THE RECESSED TYPE TO ACCOMMODATE THE FLOOR COVERING.
C. BOXES INSTALLED FOR THE ALARM, COMPUTER AND SECURITY SYSTEM SHALL BE PROVIDED WITH APPROPRIATE COVER PLATES.
- 2.04 CONDUCTORS:
A. UNLESS OTHERWISE SPECIFIED, ALL WIRE SHALL BE TYPE THHN, THWN OR XHHW COPPER. THE WIRE SHALL BE COLOR CODED INDICATING PHASE VOLTAGE. UNLESS OTHERWISE REQUIRED BY LOCAL ORDINANCES, GROUND WIRES SHALL BE GREEN, NEUTRAL WIRES SHALL BE WHITE. CONDUCTORS SHALL BE #12 AWG UNLESS OTHERWISE INDICATED.
B. INSTALL CONDUCTORS UNTIL CONDUIT SYSTEM IS COMPLETE. USE MINERALAC FIBER OR EQUIVALENT AS ALLUMINUM TO FACILITATE THE INSTALLATION OF THE CONDUCTORS IN THE CONDUIT SYSTEM.
C. ALL BRANCH CIRCUITS SHALL CONTAIN A GROUND CONDUCTOR. ALL 3 PH BRANCH CIRCUITS SHALL CONTAIN 2 PHASE CONDUCTORS AND GROUND CONDUCTOR.
D. TYPE MC CABLE SHALL BE USED WHERE CONCEALED IN WALLS OR ABOVE CEILING.
- 2.05 SWITCHING DEVICES:
A. 120A, 125 VOLT, WHITE COLOR.
B. ALL SWITCHES SHALL BE SPECIFICATION GRADE AC SILENT TYPE SWITCHES.
C. MOUNTING POLES SHALL BE SPECIFICATION GRADE, DUPLEX TYPE, NEMA 5-20R, WHITE COLOR, 20 AMPERE, 125 VOLT GROUNDED TYPE. DEVICE PLATES SHALL BE STANDARD SIZE SMOOTH FINISH WHITE COLOR UNBREAKABLE NYLON. PROVIDE TYPE OF FACEPLATES TO MATCH DEVICES.
- 2.06 PANELBOARDS:
A. PROVIDE BRANCH CIRCUIT PANELBOARD(S) AS SHOWN ON DRAWINGS AND AS SPECIFIED HEREIN. PROVIDE TIN-PLATED ALUMINUM BUS BARS. MULTIPLE POLE BREAKERS SHALL HAVE HANDLE TIES SO ALL POLES ACT SIMULTANEOUSLY. MAIN BREAKER SHALL BE CENTER MOUNTED. EQUIPMENT RATINGS SHALL EXCEED AVAILABLE FAULT CURRENT (PANELS MAY BE SERIES FAULT RATED). PROVIDE TYPED CIRCUIT DIRECTORY UNDER PLASTIC COVER IN EACH PANEL DOOR. CIRCUIT BREAKERS SHALL BE SWITCH RATED BOLT-ON TYPE. BALANCE FINAL LOADS WITHIN 10% OF ALL THREE PHASES. MOUNT PANELS 6"-6" TO TOP.
- 2.07 LIGHTING FIXTURES:
A. PROVIDE LIGHTING FIXTURES, COORDINATE PROCUREMENT OF THESE FIXTURES WITH OWNER'S REPRESENTATIVE IN A TIMELY MANNER TO MEET JOB SCHEDULES. RECEIVE, UNCRATE, INSPECT, STORE AND PROTECT ALL MATERIAL. INSTALL AND LAMP FIXTURES AS NOTED ON DRAWINGS.
B. SUBMIT ALL LIGHTING FIXTURES TO OWNER FOR APPROVAL.
- 2.08 SAFETY SWITCHES:
A. SAFETY SWITCHES SHALL BE GENERAL DUTY TYPE, 250 VOLT, WITH NUMBER OF POLES REQUIRED FOR 120/208 VAC SERVICE AND HEAVY DUTY FOR 277 VAC SERVICE. SAFETY SWITCHES FOR AIR CONDITIONING USE SHALL BE OF THE FUSIBLE TYPE. SWITCH SIZE SHALL BE AS REQUIRED BY CODE AND AS INDICATED ON THE DRAWINGS. WHERE OUTSIDE THE BUILDING, THE SWITCHES SHALL BE RAIN TIGHT TYPE NEMA 3R. ALL SWITCHES SHALL BE LOCKABLE. VERIFY DISCONNECT SIZES WITH EQUIPMENT MANUFACTURERS.
- 2.09 MOTOR WIRING:
A. WIRE ALL MOTORS TO CONFORM WITH MANUFACTURERS RECOMMENDATIONS AND WITH APPLICABLE CODES. PROVIDE NECESSARY MATERIAL, INCLUDING WIRE, CONDUIT, FITTINGS, ETC. REQUIRED TO CONNECT MOTOR. MOTORS, STARTERS, ETC. SHALL BE PROVIDED BY THE SUPPLIER OF THE DRIVEN EQUIPMENT. VERIFY EQUIPMENT LOCATION AND SIZES WITH THE TRADE SUPPLYING THE MOTOR BEFORE INSTALLING THE CONDUIT OR OUTLETS.
- 2.10 TELEPHONE/DATA SYSTEM:
A. WALL OUTLETS SHALL CONSIST OF STANDARD 4-SQUARE BOXES WITH 3/4" CONDUIT TO CEILING SPACE. DEVICE COVERPLATES SHALL HAVE RECEPTACLES. PROVIDE PULL STRING IN ALL EMPTY CONDUITS.
- 2.11 FIRE ALARM SYSTEM:
A. PROVIDE A COMPLETE ADDRESSABLE FIRE ALARM SYSTEM WITH DEVICES AS SHOWN ON DRAWINGS.
B. INSTALL AND TEST SYSTEM PER NFPA72.
C. CONNECT TO MONITORING SERVICE SELECTED BY OWNER.
- 2.12 LIGHTING CONTROL SYSTEM:
A. PROVIDE A PROGRAMMABLE TIME-BASED, SENSOR-BASED AND MANUAL LIGHTING CONTROL SYSTEM WITH DEVICES AS INDICATED ON THE DRAWING AND ADDITIONAL DEVICES AS REQUIRED FOR A FULL AND COMPLETE SYSTEM. THE SYSTEM SHALL HAVE THE FOLLOWING FEATURES:
1. ALL SYSTEM DEVICES SHALL BE NETWORKED TOGETHER ENABLING DIGITAL COMMUNICATION AND SHALL BE INDIVIDUALLY ADDRESSABLE. THE SYSTEM ARCHITECTURE SHALL FACILITATE REMOTE OPERATION VIA A COMPUTER CONNECTION AND SHALL INCLUDE ALL REQUIRED SOFTWARE.
2. ALL DEVICES IN THE LIGHTING CONTROL SYSTEM SHALL HAVE A 5 YEAR WARRANTY.
3. THE SYSTEM SHALL BE FULLY COMMISSIONED WITH OPERATIONAL INPUT FROM THE OWNER AND OWNER TRAINING.
4. PRE-APPROVED SYSTEMS ARE NUGHT NETWORK CONTROL SYSTEM FROM SENSOR SWITCH ACUITY BRANDS COMPANY OR DIGITAL LIGHTING MANAGEMENT SYSTEM FROM WATSTOPPER.
B. OCCUPANCY SENSORS SHALL PROVIDE LIGHTING CONTROL IN ROOMS INDICATED ON DRAWING. OCCUPANCY SENSORS SHALL BE ADJUSTABLE TIME, DUAL TECHNOLOGY, CEILING MOUNTED.
- 2.12 TEMPERATURE CONTROL:
A. UNLESS OTHERWISE INDICATED ON THE PLANS, ALL CONDUIT, WIRING, BOXES, ETC. FOR TEMPERATURE CONTROLS SHALL BE FURNISHED AND INSTALLED BY THE MECHANICAL CONTRACTOR.
- 2.13 GENERATOR:
A. DIESEL GENERATOR RATED 200 KW, 250 KVA, @ 0.8 PF, 277/480 VAC, 3 PHASE, 60 HZ.
B. SUB BASE FUEL TANK - 400 GALLONS DOUBLE WALL CONSTRUCTION APPROXIMATELY 24 HOUR RUN TIME. CONTAINMENT WITH LEAK DETECTION MONITOR U.L. 142 LISTED.
C. WEATHER PROTECTIVE HOUSING, SOUND ATTENUATED.
D. PROVIDE 3 POLE 350 AMP ENCLOSED CIRCUIT BREAKER.
E. APPROVED MANUFACTURERS:
CATERPILLAR
GENERAC
KOHLER
ONAN
TAYLOR
- 2.14 AUTOMATIC TRANSFER SWITCH:
A. SERVICE ENTRANCE RATED 600 AMPS, 480 VOLTS, 3 PHASE, 3 POLE NEMA 3R ENCLOSURE. SOLID NEUTRAL OPEN TRANSITION.
- 2.15 LABELING
A. PROVIDE NAMEPLATES TO IDENTIFY PANELBOARDS, DISCONNECT SWITCHES, STARTERS, AND OTHER MAJOR EQUIPMENT.
- 2.16 GUARANTEE
A. GUARANTEE ALL MATERIAL FURNISHED AND ALL WORKMANSHIP PERFORMED FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE OF THE WORK. ANY DEFECTS DEVELOPING WITHIN THIS PERIOD, TRACEABLE TO MATERIAL FURNISHED AS PART OF THIS SECTION OR WORKMANSHIP PERFORMED HEREUNDER, SHALL BE CORRECTED AT NO EXPENSE TO THE OWNER.
- 2.17 CONDITIONS PRECEDENT TO FINAL ACCEPTANCE:
A. UPON COMPLETION OF PROJECT, PREPARE AND SUBMIT ONE COMPLETE SET OF ELECTRICAL RECORD DRAWING OF "AS-BUILT" CONDITIONS SHOWING ALL WIRING AS ACTUALLY INSTALLED. PRINTS SHALL ALSO SHOW, AS INDICATED BY MARKED-UP NOTATIONS, ALL DEVIATIONS AND CHANGES OF WIRING AND CIRCUIT NUMBER FROM THE ORIGINAL CONTRACT DRAWINGS.

Order Plans @