

ELECTRICAL SPECIFICATIONS

SECTION 16000 – SPECIAL CONDITIONS – ELECTRICAL

PART 1 – GENERAL
1.1 SCOPE

ELECTRICAL SYSTEM LAYOUTS INDICATED ON THE DRAWINGS ARE GENERALLY DIAGRAMMATIC IN AN EFFORT TO SHOW THE OWNERS INTENT, LOCATION OF OUTLETS, EQUIPMENT, CONDUIT ROUTING AND COMBINING OF ALL CIRCUITS ARE SHOWN APPROXIMATELY AND SHALL BE INSTALLED CONSISTENT WITH JOB CONDITIONS AND APPLICABLE CODE REQUIREMENTS. ELECTRICAL CONTRACTOR SHALL PROVIDE ALL LABOR AND MATERIALS NECESSARY FOR A COMPLETE WORKING SYSTEM, AND ALL FINAL DESIGNS OF THE COMPLETE ELECTRICAL SYSTEM

- B. SECTIONS 16000 THROUGH 16999 ARE SUBJECT TO ALL APPLICABLE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

1.2 REGULATIONS, CODES AND FEES

- A. COMPLY WITH ALL APPLICABLE OSHA, FEDERAL, STATE, AND MUNICIPAL LAWS AND REGULATIONS
- B. COMPLY WITH ALL APPLICABLE ANSI, IEEE, NEMA, AND UTILITY COMPANY STANDARDS AND REGULATIONS.
- C. COMPLY WITH APPLICABLE NFPA CODES: REFERENCES HEREIN TO THE CODE" OF TO "NEC" REFER TO THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (NFPA-70--LATEST).
- D. SECURE NECESSARY PERMITS AND PAY ALL REQUIRED FEES APPLICABLE TO THE WORK IN DIVISION 16.

1.3 UTILITIES

- A. NOTIFY THE POWER AND TELEPHONE UTILITIES REGARDING THE CONSTRUCTION SCHEDULE AND ANTICIPATED DATES WHEN THE UTILITIES SHOULD BEGIN AND COMPLETE THE WORK.
- B. PAY ANY REQUIRED UTILITY COMPANY FEES OR BACK CHARGES IN CONJUNCTION WITH THE PERMANENT SERVICE IN SUFFICIENT TIME TO ALLOW THE UTILITY TO SCHEDULE AND COMPLETE THE WORK.
- C. NOTIFY LOCAL UNDERGROUND FACILITIES PROTECTIVE ORGANIZATION BEFORE PERFORMING AN EXCAVATION.
- D. COORDINATE LOCATIONS OF ALL UTILITIES.
- E. ELECTRICAL INSPECTIONS ARE REQUIRED FOR SERVICE,ROUGHWIRE, AND FINAL INSPECTION WITH CERTIFICATE PROVIDED TO OWNER WITH SUBMISSION OF FINAL INVOICE.

1.4 EQUIPMENT AND SYSTEM INCLUDED IN DIVISION 16

- A. INTENT: PROVIDE ALL MATERIALS, SUPPLIES, LABOR AND EQUIPMENT REQUIRED TO PLACE IN SATISFACTORY OPERATING CONDITION THE ELECTRICAL SYSTEMS SHOWN ON THE ELECTRICAL DRAWINGS AND OTHER DRAWINGS AS APPLICABLE AND SPECIFIED IN THIS DIVISION.
- B. THE ELECTRICAL DRAWINGS SHOW THE LAYOUT, SWITCHING, CIRCUITING, ETC., BUT NOT MINUTE DETAILS.
- C. ELECTRICAL EQUIPMENT AND SYSTEMS – BRIEF SCOPE:
1. PRIMARY SERVICE
 2. METERING
 3. GROUNDING
 4. MAIN SWITCH PANEL
 5. LIGHTING AND POWER FEEDERS
 6. CONDUIT, WIRING, OUTLETS, SWITCHES, ETC.
 7. MOTOR DISCONNECT SWITCHES – WHERE REQUIRED BY THE CODE.
 8. LIGHTING FIXTURES AND LAMPS
 9. MOTOR STARTERS, PUSH BUTTONS (IF REQUIRED)

1.5 ELECTRICAL EQUIPMENT SPECIFIED IN OTHER DIVISIONS

- A. INTENT: IT IS THE INTENT OF THESE SPECIFICATIONS THAT DIVISION 16 WILL PROVIDE THE MAIN POWER SUPPLY WIRING FOR THE SWITCHBOARD AND PANEL THROUGH THE DISCONNECTS (IF REQUIRED) AND THE LOAD CONTACTS OF THE CONTROLLER TO THE MOTOR OR OTHER LOAD, UNLESS SPECIFICALLY NOTED OTHERWISE. EXCEPT AS OTHERWISE NOTED, THE CONTROL CIRCUIT SHALL BE PROVIDED BY THE CONTRACTOR FURNISHING THE EQUIPMENT SO THAT THE RESPONSIBILITY FOR THE EQUIPMENT AND ITS CONTROL CIRCUIT REST WITH ONE CONTRACTOR. WHERE THE POWER SUPPLY CIRCUIT IS ALSO THE CONTROL CIRCUIT, THE WIRING SHALL BE INCLUDED UNDER DIVISION 16.
- B. BEFORE SUBMITTING PROPOSAL:
1. EXAMINE ALL DRAWINGS AND SPECIFICATIONS RELATING TO WORK OF ALL OTHER TRADES TO DETERMINE SCOPE AND RELATION TO OTHER WORK
 2. EXAMINE ALL EXISTING CONDITIONS AFFECTING COMPLIANCE WITH PLANS AND SPECIFICATIONS BY VISITING SITE AND OR BUILDING.
 3. ASCERTAIN ACCESS TO SITE, AVAILABLE STORAGE, AND DELIVERY FACILITIES.
 4. CALL ANY DISCREPANCIES OR PROPOSED CHANGES TO THE ATTENTION OF THE OWNER PRIOR TO SUBMITTING A PROPOSAL.
- C. BEFORE COMMENCING WORK:
1. VERIFY ALL GOVERNING DIMENSIONS AT SITE AND OR BUILDING.
 2. INSPECT ALL ADJACENT WORK.
 3. THE PROVISIONS OF THE GENERAL REQUIREMENTS, DIVISION 1, SHALL PREVAIL FOR UTILIZATION OF PRODUCTS CONSIDERED "OR EQUAL" BY THE NAMED MANUFACTURER(S) IN THE TECHNICAL SPECIFICATIONS OF DIVISION 16.
 4. THE ENGINEER SHALL BE THE SOLE JUDGE FOR DETERMINING IF A SUBMITTED PRODUCT IS "EQUAL" TO THE NAMED MANUFACTURER(S) IN THE TECHNICAL SPECIFICATIONS.
 5. EQUIPMENT SUBSTITUTED FOR THAT OF THE FIRST NAMED MANUFACTURER MUST CONFORM TO THE SPACE REQUIREMENTS SHOWN ON THE DRAWING. ANY SUBSTITUTED EQUIPMENT THAT CANNOT MEET SPACE REQUIREMENTS SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE. ANY MODIFICATIONS OF RELATED SYSTEMS (ELECTRICAL, PIPING, DUCTWORK, ETC.) CAUSED BY A SUBSTITUTION SHALL BE MADE AT THE CONTRACTOR'S EXPENSE.

6. THE COST OF REDESIGN FOR ANY BUILDING COMPONENT NECESSITATED BY THE SUBSTITUTION OF EQUIPMENT FOR THE FIRST NAMED IN THE TECHNICAL SPECIFICATIONS OF DIVISION 16 SHALL BE BORN BY THE CONTRACTOR MAKING SUCH SUBSTITUTION AND SHALL BE INCLUDED AS PART OF HIS BID.
 7. ACCEPTANCE OF SUBSTITUTED EQUIPMENT BY THE ENGINEER DOES NOT RELIEVE THE CONTRACTOR FROM MEETING ALL REQUIREMENTS OF DIVISION 16.
 8. SUBSTITUTION OF EQUIPMENT, SYSTEMS, ETC., REQUIRING APPROVAL OF LOCAL AUTHORITIES MUST COMPLY WITH SUCH REGULATIONS AND SHALL BE FILED FOR APPROVAL AT THE EXPENSE OF CONTRACTOR (SHOULD FILING BE NECESSARY). THE CONTRACTOR IN OFFERING SUBSTITUTIONS SHALL HOLD THE OWNER AND ENGINEER HARMLESS IF THE SUBSTITUTED ITEM IS AN INFRINGEMENT OF A PATENT HELD BY THE SPECIFIED MANUFACTURER.
- D. PROVIDE DISCONNECT SWITCHES WHERE REQUIRED BY THE CODE AND AS INDICATED ON DRAWINGS.
- E. PROVIDE MOTOR CONTROLLERS (EXCEPT AS OTHERWISE NOTED) AND BE RESPONSIBLE FOR OBTAINING THE PROPER OVERLOAD RELAY THERMAL TRIP UNITS. (SIZING SHALL BE DETERMINED FROM THE ACTUAL FULL LOAD CURRENT AS GIVEN OF THE MOTOR NAMEPLATE).

1.6 DISCREPANCIES

- A. CALL ALL DISCREPANCIES TO THE ATTENTION OF THE OWNER BEFORE BIDS ARE TAKEN.

1.7 TESTS

- A. GENERAL:
1. SCHEDULE ALL TESTS AS SOON AS EACH PART OF THE WIRING SYSTEM IS COMPLETE AND BEFORE IT IS ENERGIZED.
 2. FOR MEDIUM VOLTAGE SYSTEMS, NOTIFY THE OWNER AT LEAST 48 HOURS IN ADVANCE OF THE TEST.
 3. FOR GROUNDING SYSTEMS TEST OUT OF DOORS. DO NOT SCHEDULE TESTS WITHIN 48 HOURS AFTER A RAINFALL.
 4. PROVIDE ALL TEST EQUIPMENT AND SET-UP.
 5. PROVIDE ALL ELECTRICAL ENERGY FOR THE TESTS UNLESS NOTED OTHERWISE.
- B. WIRING SYSTEMS – 600 VOLTS OR LESS:
1. ALL CONDUCTORS OF ALL SYSTEMS SHALL BE TESTED FOR OPENS, SHORTS, AND GROUNDS.

1.8 DEFINITIONS

- A. CONTRACT DOCUMENTS ARE SUPPLEMENTED AS FOLLOWS:
1. "APPROVAL", "APPROVED", REFER TO ACCEPTANCE BY ENGINEER, CODE-ENFORCING AUTHORITY, OR UTILITY INSPECTION AUTHORITY.
 2. "NECESSARY"; NECESSITATED BY JOB CONDITIONS TO ATTAIN THE SPECIFIED RESULT.
 3. "PERMITTED"; BY TERMS OF SPECIFICATION ON DRAWINGS, OR BY INSPECTION AUTHORITIES.
 4. "PROVIDE"; FURNISH, INSTALL AND WIRE.
 5. "REQUIRED"; EXPRESSED OR IMPLIED REQUIREMENTS OF SPECIFICATION OR DRAWINGS, OR OF REFERENCED APPLICABLE CODES.
 6. "STANDARD"
- A. CONFORMING WITH APPLICABLE PUBLISHED STANDARDS OF TRADE OR TECHNICAL ORGANIZATION.
- B. REGULARLY CATALOGED MANUFACTURER PRODUCTS.

1.9 REQUIRED SUBMITTALS

- A. SUBMIT SHOP DRAWINGS UNDER PROVISIONS OF DIVISION 1.
- B. SUBMIT SHOP DRAWINGS FOR APPROVAL ON THE FOLLOWING ITEMS:
1. MAIN SWITCH PANEL
 2. FUSIBLE SWITCHES
 3. LIGHTING FIXTURES/LAMPS
 4. MOTOR STARTERS, PUSH BUTTONS, LIGHTING CONTRACTORS
 5. METERING
 6. NEMA 3R CABINETS

SECTION 16111 – CONDUIT

PART 1 – GENERAL

1.1 SCOPE

- A. THIS SECTION SUBJECT TO APPLICABLE REQUIREMENTS OF THE CONTRACT DOCUMENTS.
- B. WORK INCLUDES ALL CONDUIT REQUIRED BY THE CONTRACT, AND, IN GENERAL INCLUDES THE FOLLOWING ITEMS:
1. RIGID METAL CONDUIT AND FITTINGS
 2. INTERMEDIATE METAL CONDUIT AND FITTINGS
 3. SCH. 40 PVC FOR UNDERGROUND FEEDS ONLY. (1"Ø" ENVELOPE OF CONCRETE FOR MAIN SERVICE OR AS REQUIRED BY LOCAL AUTHORITIES.)

SECTION 16120 – WIRE AND CABLE

PART 1 – GENERAL

1.1 SCOPE

- A. THIS SECTION SUBJECT TO APPLICABLE REQUIREMENTS OF THE CONTRACT DOCUMENTS.
- B. WORK INCLUDES ALL WIRE AND CABLE REQUIRED BY THE CONTRACT, AND, IN GENERAL INCLUDES THE FOLLOWING ITEMS:
1. USE TYPE THHN FOR ALL NON DAMP AREAS THWN FOR DAMP AREAS

SECTION 16141 – WIRING DEVICES

PART 1 – PRODUCTS

1.1 ACCEPTABLE MANUFACTURERS

- A. HUBBELL
- B. PASS & SEYMOUR
- C. GENERAL ELECTRIC
- D. LEVITON

1.2 EXECUTION

- A. SURFACE MOUNTED DEVICES INCLUDING BOXES SHALL BE STEEL OR CAST PLASTIC BOXES ARE NOT ACCEPTABLE.

SECTION 16300 – SECONDARY POWER SYSTEM

PART 1 – GENERAL

1.1 WORK INCLUDED

- A. PROVIDE BRANCH CIRCUIT PANELS.
- B. PROVIDE FEEDER CONDUITS AND CONDUCTORS.
- C. PROVIDE METERING AS REQUIRED BY UTILITY CO.
- D. PROVIDE SECONDARY CONDUIT AND WIRING

SECTION 16470 – PANELS

PART 1– GENERAL

1.1 WORK INCLUDED

- A. LIGHTING AND APPLIANCE BRANCH CIRCUIT PANEL BOARDS AND ALL REQUIRED BREAKERS. BREAKERS TO BE COMMERCIAL GRADE.
- B. PROVIDE COPPER BUS IN ALL PANELS.

PART 2 – PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS – PANELS

- A. GENERAL ELECTRIC
- B. SQ D

PART 3. – EXECUTION

3.1 INSTALLATION

- A. INSTALL PANEL BOARDS PLUMB, IN CONFORMANCE WITH NEMA PB 1.1.
- B. INSTALL IN NEMA 3R ENCLOSURE.
- C. PROVIDE FILLER PLATES FOR UNUSED SPACES IN PANELS.
- D. PROVIDE TYPED CIRCUIT DIRECTORY FOR EACH BRANCH CIRCUIT PANEL. REVISE DIRECTORY TO REFLECT CIRCUITING CHANGES
- E. VERIFY A.I.C. RATINGS WITH POWER C.O. PRIOR TO ORDERING EQUIPMENT
- F. ALL SERVICE EQUIPMENT SHALL BE OF ONE MANUFACTURER

SECTION 16500 – LIGHTING

PART 1 – GENERAL

1.1 WORK INCLUDED

- A. FURNISH AND INSTALL LUMINARIES SHOWN AND SPECIFIED: TYPE DESIGNATIONS ARE THOSE SHOWN ON PLANS.
1. PROVIDE BALLASTS, FUSES, AND INTEGRAL CONTROLS.
 2. SPECIFICATION IDENTITIES BASIC MODELS ONLY: PROVIDE ALL FRAMES, TRIM SUPPORTS AND ACCESSORIES NECESSARY FOR PROPER INSTALLATION WITH CEILING SUPPORT SYSTEMS AND FINISHING MATERIALS PROVIDED UNDER GENERAL CONSTRUCTION DIVISION.
 3. PROVIDE ALL MODIFICATIONS SHOWN OR SPECIFIED.
- B. WIRE COMPLETE AS SHOWN.
- C. PROVIDE COMPLETE INSTALLATION OF LAMPS, NEW AT TIME OF DESIGN

SECTION 16600 – GROUNDING

PART 1 – GENERAL

1.1 WORK INCLUDED

- A. INSTALL GROUND RODS, FITTINGS, BONDING BUSHINGS, GROUNDING ELECTRODE CONDUCTORS, AND GROUNDING CONDUCTORS PER THE APPROPRIATE SECTIONS OF THE CODE.

1.2 PLUMBING SYSTEM

- A. CONNECT ALL INCOMING WATER PIPES TO THE UNDERGROUND LOOP OR TO THE SERVICE GROUND POINT.

SECTION 16700 – WARRANTY

A. ELECTRICAL CONTRACTOR WARRANTS:

(1) THE ELECTRICAL SYSTEM TO BE FREE OF DEFECTIVE WORKMANSHIP AND MATERIALS FOR A PERIOD OF ONE YEAR FROM DATE OF PERMANENT OCCUPANCY.

(2) THAT ALL EQUIPMENT FURNISHED AND INSTALLED BY ELEC. CONT'R. WILL CARRY A MANUFACTURER'S REPLACEMENT PART WARRANTY FOR A PERIOD OF ONE YEAR FROM THE DATE OF PERMANENT OCCUPANCY.

THAT ELEC. CONT'R. WILL FURNISH AT NO CHARGE WITHIN ONE YEAR FROM THE DATE OF PERMANENT OCCUPANCY ANY LABOR NECESSARY TO PROPERLY IMPLEMENT THE ABOVE EQUIPMENT WARRANTY RESPONSIBILITY.

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ELECTRICAL PLAN
ROCKWALL TECHNOLOGY PARK
ROCKWALL EDC

DRAWN:

CHECKED:

DATE: MAY 2012

SCALE: AS SHOWN

JOB NO.:

MEP2



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