

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	06-00334-00-SW	MCLEAN	14	E1.4
STA.	TO STA.			
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		

ELECTRICAL SPECIFICATION

1. RELATED DOCUMENTS

- A. GENERAL PROVISIONS OF THE CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS, APPLY TO WORK INDICATED ON THE ELECTRICAL DRAWINGS.
- B. THESE DRAWINGS INDICATE THE GENERAL EXTENT OF THE WORK AND ARE NOT INTENDED TO INDICATE OR DESCRIBE ALL WORK REQUIRED FOR THE FULL PERFORMANCE AND COMPLETION OF THE REQUIREMENTS OF THE CONTRACT DOCUMENTS. REFER TO THE CONTRACT DOCUMENTS FOR ADDITIONAL REQUIREMENTS GOVERNING THE WORK OF THIS CONTRACT.
- C. EXISTING CONDITIONS SHOWN ARE BASED ON INFORMATION OBTAINED FROM THE FIELD OBSERVATIONS, AND SHALL NOT BE CONSIDERED "AS-BUILT" AND EXTREME ACCURACY IS NOT GUARANTEED. THE CONTRACTOR SHALL FIELD VERIFY EXISTING INSTALLATIONS BEFORE SUBMITTING THE BID AND PRIOR TO COMMENCING WORK TO ENSURE PROPER COORDINATION AND BE FULLY FAMILIAR WITH EXISTING CONDITIONS. NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES.

2. SCOPE OF WORK

- A. PROVIDE ALL LABOR, MATERIALS, TOOLS, AND EQUIPMENT REQUIRED FOR A COMPLETE AND FUNCTIONAL ELECTRICAL SYSTEM AS SPECIFIED AND INDICATED ON THE DRAWINGS.
- B. MAKE APPLICATION, OBTAIN, AND PAY FOR ALL LICENSES, PERMITS, INSPECTIONS, AND FEES REQUIRED BY ALL AUTHORITIES HAVING JURISDICTION FOR ELECTRICAL SYSTEMS.
- C. PROMPTLY INFORM THE ENGINEER IN WRITING OF ANY DEVIATIONS IN THE CONTRACT DOCUMENTS FROM REQUIREMENTS OF LOCAL UTILITIES OR LOCAL STATE OR FEDERAL LAWS AND RULES. PERFORM THE WORK IN ACCORDANCE WITH SUCH REQUIREMENTS AT NO ADDITIONAL COST TO THE OWNER.

3. SUBMITTALS

- A. SUBMIT A MINIMUM OF SIX (6) SETS OF MANUFACTURERS' PRODUCT LITERATURE FOR ALL MAJOR ELECTRICAL EQUIPMENT PROVIDED.
- B. UPON SUBSTANTIAL COMPLETION OF THE WORK THE CONTRACTOR SHALL SUBMIT FULLY DETAILED RECORD DRAWINGS TO THE OWNER. THE CONTRACTOR'S RECORD DRAWINGS SHALL SHOW THE COMPLETE ELECTRICAL INSTALLATION.
- C. SUBMIT A MINIMUM OF SIX (6) SETS OPERATING AND MAINTENANCE MANUALS FOR ALL INSTALLED EQUIPMENT. MANUALS SHALL INCLUDE THE FOLLOWING:
 - 1. PRODUCT INFORMATION.
 - 2. NORMAL OPERATING CHARACTERISTICS AND LIMITS.
 - 3. ENGINEERING DATA.
 - 4. COMMERCIAL REPLACEMENT PART NUMBERS.
 - 5. OPERATING AND MAINTENANCE INSTRUCTIONS.
- D. SUBMIT ORIGINAL CERTIFICATES OF INSPECTION AND OTHER CERTIFICATES OF COMPLETION OR ACCEPTANCE TO THE OWNER.

4. QUALITY ASSURANCE

- A. MANUFACTURER QUALIFICATIONS: PROVIDE ELECTRICAL PRODUCTS OF MANUFACTURERS REGULARLY ENGAGED IN MANUFACTURING ELECTRICAL PRODUCTS COMPLYING WITH PROJECT REQUIREMENTS THAT HAVE BEEN USED ON AT LEAST FIVE PROJECTS OF SIMILAR SIZE AND SCOPE AS THIS PROJECT.
- B. INSTALLER QUALIFICATIONS: FIRMS WITH AT LEAST THREE (3) YEARS OF SUCCESSFUL INSTALLATION EXPERIENCE ON PROJECTS WITH ELECTRICAL EQUIPMENT AND MATERIALS SIMILAR TO THAT REQUIRED FOR THIS PROJECT.
- C. PROVIDE ELECTRICAL EQUIPMENT AND MATERIALS THAT ARE UL LISTED AND LABELED.
- D. INSTALL WORK TO MEET THE REQUIREMENTS OF THE MOST CURRENT EDITION OF THE FOLLOWING CODES AS APPLICABLE TO INSTALLATION AND MATERIALS OF ELECTRICAL EQUIPMENT AND PRODUCTS:
 - 1. NFPA-70, NATIONAL ELECTRICAL CODE.
 - 2. ANSI/IEEE C2, NATIONAL ELECTRICAL SAFETY CODE.
 - 3. OSHA, OCCUPATIONAL SAFETY AND HEALTH ACT.
- E. ALL ELECTRICAL MATERIALS AND INSTALLATIONS SHALL COMPLY WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL LAWS, RULES, AND ORDINANCES.
- F. ALL ELECTRICAL EQUIPMENT AND MATERIALS SHALL BE NEW AND MEET THE REQUIREMENTS OF ALL APPLICABLE STANDARDS OF THE FOLLOWING ORGANIZATIONS:
 - 1. AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI).
 - 2. AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM).
 - 3. CERTIFIED BALLAST MANUFACTURERS (CBM).
 - 4. ELECTRONIC INDUSTRIES ASSOCIATION (EIA).
 - 5. ELECTRICAL TESTING LABORATORIES (ETL).
 - 6. FACTORY MUTUAL (FM).
 - 7. ILLUMINATING ENGINEERING SOCIETY OF NORTH AMERICA (IES).
 - 8. THE INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS (IEEE).
 - 9. NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA).
 - 10. NATIONAL FIRE PROTECTION ASSOCIATION (NFPA).
 - 11. UNDERWRITERS' LABORATORIES, INC. (UL).

5. DELIVERY, STORAGE AND HANDLING

- A. DELIVER ELECTRICAL EQUIPMENT AND MATERIALS IN FACTORY-FABRICATED TYPE CONTAINERS AND WRAPPINGS, WHICH PROPERLY PROTECT THE CONTENTS FROM DAMAGE. MARK EACH PACKAGE OR PIECE WITH THE MANUFACTURER'S NAME, VENDOR'S NAME, OWNER'S NAME, AND THE PROJECT NAME AND NUMBER.
- B. DELIVER ELECTRICAL PRODUCTS TO THE JOB SITE PROPERLY IDENTIFIED WITH NAMES, MODEL NUMBERS, TYPES, GRADES, COMPLIANCE LABELS, AND OTHER INFORMATION REQUIRED FOR IDENTIFICATION.
- C. DO NOT RELEASE MATERIALS TO THE JOB SITE UNTIL THE TIME FOR INSTALLATION.

- D. DO NOT RELEASE MATERIALS TO THE JOB SITE UNTIL THE TIME FOR INSTALLATION.
- E. COORDINATE DELIVERY OF ELECTRICAL EQUIPMENT TO ALLOW MOVEMENT INTO DESIGNATED SPACE WHERE IT WILL BE INSTALLED.
- F. STORE ELECTRICAL PRODUCTS IN ORIGINAL PACKAGING AND PROTECTED FROM WEATHER AND CONSTRUCTION TRAFFIC. WHEREVER POSSIBLE STORE IN A DRY PLACE FREE FROM DAMAGE AND ABUSE. WHERE NECESSARY TO STORE OUTDOORS, STORE ABOVE GRADE AND ENCLOSE WITH WATERTIGHT WRAPPING.
- G. STORE ELECTRICAL EQUIPMENT AND MATERIAL IN A DRY PLACE SO CONDENSATION WILL NOT FORM ON OR IN THE EQUIPMENT.
- H. HANDLE ELECTRICAL EQUIPMENT AND MATERIALS CAREFULLY TO PREVENT PHYSICAL DAMAGE. DO NOT INSTALL DAMAGED MATERIALS; REMOVE FROM JOB SITE AND REPLACE WITH NEW.
- I. HANDLE ELECTRICAL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. WHERE PROVIDED USE FACTORY INSTALLED LIFTING PROVISIONS.

6. PROJECT/SITE CONDITIONS

- A. DO NOT INTERFERE WITH THE USE OF ADJACENT AREAS NOT INCLUDED IN THE SCOPE OF WORK. MAINTAIN FREE AND SAFE PASSAGEWAYS TO AND FROM SUCH AREAS. DO NOT CLOSE OR OBSTRUCT THE ROAD OR SIDEWALK.
- B. MAINTAIN SERVICES PASSING THROUGH THE WORK AREA TO SERVE AREAS THAT REMAIN IN USE.

7. COORDINATION

- A. THE CONTRACTOR SHALL REVIEW THE DRAWINGS OF ALL OTHER DISCIPLINES AND VERIFY THE LOCATION AND SIZE OF ELECTRICAL EQUIPMENT WILL FIT AND MATE WITH WORK OF OTHER TRADES.
- B. ALL DIFFICULTIES THAT ARE A RESULT OF NOT COORDINATING THE WORK SHALL BE RESOLVED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.

8. GUARANTEE

- A. THE CONTRACTOR SHALL GUARANTEE THE ELECTRICAL WORK TO BE FREE OF DEFECTS IN MATERIAL AND WORKMANSHIP AND OPERATE AS DESIGNED FOR A PERIOD OF ONE (1) YEAR FROM DATE OF OPERATION OF LIGHTS.
- B. SHOULD ANY PORTION OF THE ELECTRICAL WORK BE FOUND DEFECTIVE THE CONTRACTOR SHALL REPAIR OR REPLACE, AT THE OWNER'S OPTION, THE DEFECTIVE PORTION(S) OF THE WORK.
- C. UPON NOTIFICATION OF A GUARANTEE ISSUE THE CONTRACTOR SHALL PROVIDE ALL NECESSARY LABOR AND MATERIALS IN A REASONABLE AMOUNT OF TIME AND AT NO ADDITIONAL EXPENSE TO THE OWNER DURING THE GUARANTEE PERIOD.
- D. THIS GUARANTEE IS IN ADDITION TO ANY AND ALL EQUIPMENT MANUFACTURERS' WARRANTIES.

9. EXECUTION - GENERAL

- A. DO NOT SCALE DRAWINGS; FOLLOW NOTES AND WRITTEN DIMENSIONS.
- B. BRANCH CIRCUIT FOR RECEPTACLES ON POLE IS 20A/1P AND BRANCH CIRCUIT FOR DECORATIVE LIGHTS IS 20A/2P, UNLESS INDICATED OTHERWISE.

10. EXAMINATION

- A. CEASE OPERATIONS AND NOTIFY THE OWNER IMMEDIATELY IF PERSONNEL SAFETY OR STRUCTURAL STABILITY APPEARS TO BE ENDANGERED. TAKE PRECAUTIONS TO PROPERLY SUPPORT UNSTABLE ELEMENTS. DO NOT RESUME WORK UNTIL SAFETY IS RESTORED.

11. INSTALLATION

- A. RACEWAYS AND BOXES
 - 1. ALL POWER WIRING SHALL BE INSTALLED IN CONDUIT. THE CONDUIT SHALL BE RIGID GALVANIZED STEEL CONDUIT AND RIGID PVC SCHEDULE 80 (MINIMUM).
 - 2. ALL CONDUIT BENDS SHALL BE RIGID GALVANIZED STEEL.
 - 3. PROVIDE GROUNDING TYPE BUSHINGS WITH INTEGRAL GROUND LUG FOR BONDING METAL CONDUITS TO METAL ENCLOSURES.
 - 4. CAP THE ENDS OF ALL CONDUITS DURING ROUGH-IN TO PREVENT ACCESS TO DIRT AND MOISTURE.
 - 5. HANDHOLE (SPECIAL) SHALL BE A 12"x18"x18" QUARTZITE BOX.

B. WIRES AND CABLES

- 1. BRANCH CIRCUIT CONDUCTORS SHALL BE RATED 600 VAC, TYPE XHHW-2 INSULATION, AND STRANDED COPPER FOR SIZES #6 AND LARGER.
- 2. FEEDER CONDUCTORS SHALL BE RATED 600 VAC, STRANDED COPPER TYPE XHHW-2 INSULATION.
- 3. SPLICE CONDUCTORS ONLY AT THE POLE BASE. SPLICES SHALL NOT BE PULLED INTO CONDUIT. SPLICE AND TAP CONNECTORS SHALL BE COMPATIBLE WITH CONDUCTOR MATERIAL AND POSSESSES EQUIVALENT OR BETTER MECHANICAL STRENGTH AND INSULATION RATING THAN CONDUCTORS BEING SPLICED.

C. WIRING DEVICES

- 1. PROVIDE HEAVY DUTY SPECIFICATION GRADE WIRING DEVICES AS MANUFACTURED BY HUBBELL INC., GE WIRING DEVICES, OR ARROW HART. ALL WIRING DEVICES PROVIDED SHALL BE THE PRODUCTS OF ONE MANUFACTURER.
 - A) WEATHERPROOF, GROUND FAULT CIRCUIT INTERRUPTER TYPE RECEPTACLES SHALL BE HEAVY DUTY SPECIFICATION GRADE, NEMA 5-20R.
- 2. OUTLETS IN DECORATIVE POLE SHALL BE FLUSH MOUNTED UNLESS INDICATED OTHERWISE. MOUNT RECEPTACLE WITH GROUND CONNECTION UP.
- 3. STANDARD MOUNTING HEIGHT FOR ALL RECEPTACLES MOUNTED IN DECORATIVE POLE SHALL BE PROVIDED AS INDICATED IN THE DRAWING.
- 4. WEATHERPROOF COVERS FOR OUTLETS SHALL BE " IN USE WEATHERPROOF " TYPE INSTALLED IN THIS PROJECT. AND COLOR SHALL MATCH WITH POLE.

D. ELECTRICAL IDENTIFICATION

- 1. ALL ELECTRICAL INSTALLATIONS SHALL BE IDENTIFIED AND LABELED USING UL LISTED IDENTIFICATION PRODUCTS. IDENTIFICATION SHALL BE PROVIDED FOR THE FOLLOWING:
 - A) BRANCH CIRCUIT AND FEEDER CONDUCTORS.
 - B) RECEPTACLES
- 2. CIRCUIT CONDUCTORS SHALL BE COLOR CODED ACCORDING TO THE FOLLOWING.
 - A) PHASE A: BLACK - 120/208 VAC;
 - B) PHASE B: RED - 120/208 VAC;
 - C) PHASE C: BLUE - 120/208 VAC;
 - D) NEUTRAL: WHITE
 - E) GROUND: GREEN
- 3. CABLE IDENTIFICATION SHALL INCLUDE COLOR CODING AND CIRCUIT NUMBER.
- 4. RACEWAY IDENTIFICATION SHALL BE PREPRINTED SELF-ADHESIVE PLASTIC TAPE 4" LONG WITH 1-1/8" HIGH LETTERING EXTENDING 360° AROUND THE CONDUIT.
- 5. UPDATE CIRCUIT DIRECTORIES FOR 100 AMP LOAD CENTERS. INDICATE THE LOAD CENTER RATINGS TOGETHER WITH THE LOAD DESCRIPTION SERVED FOR EACH BRANCH CIRCUIT.

E. GROUNDING

- 1. PROVIDE GREEN INSULATED EQUIPMENT GROUNDING CONDUCTORS IN ALL BRANCH CIRCUITS AND FEEDERS SIZED ACCORDING TO NEC ARTICLE 250, UNLESS INDICATED OTHERWISE.
- 2. GROUND ALL ELECTRICAL SYSTEMS AND EQUIPMENT ACCORDING TO NEC ARTICLE 250.

F. LIGHTING

- 1. CONTRACTOR SHALL PROVIDE ALL LUMINAIRES INDICATED ON THE DRAWINGS AND SPECIFIED IN THE GENERAL NOTES, COMPLETE WITH LAMPS, AND SPECIFIED OR NECESSARY ACCESSORIES.
- 2. FIELD VERIFY LUMINAIRE COMPATIBILITY WITH ADJACENT CONSTRUCTION AND FINISH AND COORDINATE WITH ALL TRADES. LUMINAIRES SHALL BE PROVIDED COMPLETE WITH ALL HARDWARE, LAMPS, AND ACCESSORIES.
- 3. ALL LUMINAIRES SHALL BE UL LISTED FOR THE INTENDED LOCATION.
- 4. LIGHTING BRANCH CIRCUIT DESIGN IS BASED ON THE ELECTRICAL DATA INDICATED.
- 5. LUMINAIRES INSTALLED IN EXTERIOR LOCATIONS SHALL BE SUITABLE FOR LOCAL TEMPERATURES AND CONDITIONS.
- 6. MANUFACTURER'S STANDARD FINISH WILL BE SELECTED DURING REVIEW OF THE SHOP DRAWINGS. LUMINAIRES SHALL BE FABRICATED COMPLETE PRIORITY TO APPLICATION OF THE FINISH.
- 7. LUMINAIRE FINISHES SHALL BE MANUFACTURER'S STANDARD APPLIED OVER CORROSION RESISTANT TREATMENT OR PRIMER. PAINT FINISHES SHALL BE FREE OF STREAKS, RUNS, STAINS, BLISTERS, AND SIMILAR DEFECTS.
- 8. ALL LIGHT FIXTURES SHALL BE WEATHERPROOF AND RUSTPROOF.
- 9. EACH FIXTURE SHALL HAVE SEPERATE FUSE FOR LUMINAIRE AND SEPERATE FUSE FOR RECEPTACLE
- 10. BALLAST SHALL OPERATE FROM -20°F TO 120°F
- 11. CLEAN FIXTURES AFTER INSTALLATION. USE METHODS AND MATERIALS RECOMMENDED BY MANUFACTURER.
- 12. FINISH OF POLE/SUPPORT STRUCTURE FOR ARM, BRACKET, AND TENON MOUNT MATERIALS SHALL MATCH WITH LIGHT FIXTURE OR VICE VERSA.
- 13. POLE/SUPPORT STRUCTURE BASES: ANCHOR TYPE WITH HOLD DOWN OR ANCHOR BOLTS LEVELING NUTS, AND BOLT COVERS.
- 14. CONCRETE FOR POLE FOUNDATIONS:
 - A) DESIGN STRENGTH: 3000 PSIG (20.7-MPa), 28 DAY COMPRESSIVE STRENGTH
- 15. PROVIDE BREAKWAY CONNECTION FUSE HOLDERS ON ALL POLES AT BASE.
- 16. PROVIDE FACTORY MOUNTED 24"x36" DOUBLE ARM BANNER ATTACHMENT ON ONLY FOUR POLES. SEE DETAILS IN DRAWING. LOCATION SHALL BE DETERMINED BY OWNER.

12. GRADING AND PLANTING

- A. RESTORE SURFACE FEATURES, INCLUDING VEGETATION, AT AREAS DISTURBED BY WORK OF THIS SECTION. REESTABLISH ORIGINAL GRADES UNLESS OTHERWISE INDICATED. RESTORE AREAS DISTURBED BY TRENCHING, BORING, STORING DIRT, CABLE LAYING, AND OTHER TO THEIR ORIGINAL CONDITION. MAINTAIN RESTORED SURFACES.

13. ADJUSTING

- A. TEST AND ADJUST, WHERE NECESSARY, ELECTRICAL EQUIPMENT AND DEVICES IN THE PRESENCE OF THE OWNER'S REPRESENTATIVE TO ENSURE EQUIPMENT OPERATES AS INTENDED. REPAIR OR REPLACE MALFUNCTIONING UNITS AT THE SITE AND RETEST.

14. PROTECTION

- A. PROVIDE AND MAINTAIN TEMPORARY PROTECTION OF EXISTING CONDITIONS THAT ARE TO REMAIN AS WELL AS INSTALLED NEW WORK. SUCH PROTECTION SHALL INCLUDE GUARDS AND BARRIERS WHERE MATERIALS ARE HANDLED OR EQUIPMENT MOVED AND DUST PROOF PARTITIONS TO PREVENT THE SPREAD OF DUST, FUMES, AND NOISE TO OTHER AREAS. UPON COMPLETION OF THE WORK REMOVE THE PARTITIONS AND REPAIR DAMAGED SURFACES TO MATCH ADJACENT SURFACES. THE CONTRACTOR SHALL REPAIR OR REPLACE AT THE OWNER'S OPTION ANY PORTION OF THE WORK OR ANY PART OF EXISTING BUILDING THAT IS DAMAGED DUE TO INADEQUATE PROTECTION. SUCH REPAIRS SHALL BE AT NO COST TO THE OWNER.

REVISIONS	
NAME	DATE

ILLINOIS DEPARTMENT OF TRANSPORTATION
 ELECTRICAL SPECIFICATIONS
 CITY OF BLOOMINGTON
 DOWNTOWN MAIN STREET BEAUTIFICATION
 FRONT STREET TO WASHINGTON STREET
 SCALE: VERT.
 HORIZ.
 DATE: 01-31-08
 DRAWN BY:
 CHECKED BY:

PLOT DATE = 08/07/08
 FILE NAME = 06ELE1.4
 USER NAME = 08/07/08