



ADDITION, RENOVATIONS AND RECONSTRUCTIONS FOR

# SPELLMAN MUSEUM

## OF FORNEY HISTORY

200 S. BOIS D'ARC STREET - FORNEY, TEXAS 75126

### ELECTRICAL SPECIFICATIONS

AUGUST 21, 2012

# E3.1

#### ELECTRICAL GENERAL SPECIFICATION NOTES

- G1. **CONTRACTOR RESPONSIBILITY:** THE ELECTRICAL NOTES, SPECIFICATIONS, AND PLANS ("THE DOCUMENTS") ADDRESS THE REQUIREMENTS AND RESPONSIBILITIES OF THE ELECTRICAL CONTRACTOR. UNLESS NOTED OTHERWISE, THE ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR ALL WORK OF AN ELECTRICAL NATURE. THE TERM "PROVIDE" USED IN THESE DOCUMENTS SHALL BE DEFINED AS "FURNISH AND INSTALL."
- G2. **COMPLETE SYSTEMS:** PROVIDE LABOR, MATERIALS, EQUIPMENT, AND TRANSPORTATION TO RECEIVE, INSTALL, ADJUST, AND PUT INTO OPERATION COMPLETE ELECTRICAL SYSTEMS IN ACCORDANCE WITH THE INTENT OF THE CONTRACT DOCUMENTS. PROVIDE PRODUCTS NOT MENTIONED BUT NECESSARY AND INCIDENTAL TO THE COMPLETION OF THIS WORK.
- G3. **SCOPE:** WORK SHALL INCLUDE, BUT NOT BE LIMITED TO THE FOLLOWING: MECHANICAL WORK AS REQUIRED FOR COORDINATION, POWER DISTRIBUTION AND LIGHTING.
- G4. **UTILITIES:** COORDINATE WITH ALL BUILDING SERVICES AS REQUIRED. NOTIFY OWNER OF COMMENCEMENT OF WORK. MAKE ALL ARRANGEMENTS FOR TEMPORARY SERVICES. PROVIDE ALL WORK AND MATERIALS NECESSARY TO COMPLY WITH ALL OWNER REGULATIONS AND REQUIREMENTS.
- TEMPORARY POWER:** ELECTRICAL CONTRACTOR TO FURNISH TEMPORARY ELECTRICAL WIRING. REMOVE ALL TEMPORARY WIRING WHEN PERMANENT WIRING IS AVAILABLE.
- G5. **PERMITS:** OBTAIN ALL NECESSARY PERMITS TO BEGIN AND CONTINUE WITH WORK. PAY ALL ASSOCIATED FEES FOR PERMITS AND OTHER MUNICIPAL AND GOVERNING REQUIREMENTS.
- G6. **EXPERIENCE:** ALL WORK DONE SHALL BE PERFORMED BY QUALIFIED ELECTRICIANS UNDER THE SUPERVISION AND DIRECTION OF A SUPERINTENDENT HAVING SUCCESSFUL EXPERIENCE INSTALLING AND SUPERVISING EQUIPMENT AND SYSTEMS OF SIMILAR TYPE AND SIZE AS INDICATED BY CONTRACT DOCUMENTS.
- G7. **REGULATIONS:** ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH CURRENT RULES, REGULATIONS, AND INDUSTRY STANDARDS OF THE NATIONAL ELECTRICAL CODE (NEC), UL, IPCEA, NEMA, NFPA, OSHA, NATIONAL ELECTRICAL SAFETY CODE, ADA, AND ANY LOCAL CODES, LAWS, OR ORDINANCES. IN THE EVENT THAT A DISCREPANCY IS FOUND IN THE CONTRACT DOCUMENTS, THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY.
- G8. **COSTS AND CONDITIONS:** EXAMINE AND BECOME FAMILIAR WITH ALL CONTRACT DOCUMENTS IN THEIR ENTIRETY. SURVEY THE PROJECT AND BECOME FAMILIAR WITH EXISTING CONDITIONS AND SCOPE OF WORK. ALL COSTS SUBMITTED SHALL BE BASED ON A THOROUGH KNOWLEDGE OF ALL WORK AND MATERIALS REQUIRED. ANY ADDITIONAL COSTS DUE TO FAILURE TO COMPLY WITH THIS REQUIREMENT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
- G9. **SPECIFICATIONS:** BECOME FAMILIAR WITH ALL SPECIFICATIONS, DESIGN CRITERIA, AND EQUIPMENT REQUIREMENTS PRIOR TO ANY EQUIPMENT PURCHASE OR INSTALLATION. REFERENCE SPECIFICATIONS FOR DEVICES, MATERIALS, AND WORKMANSHIP REQUIREMENTS. ADDITIONAL REQUIREMENTS ARE GIVEN IN THESE NOTES AND THE DRAWINGS. THERE SHALL BE NO DEVIATIONS FROM SPECIFICATIONS WITHOUT THE APPROVAL OF THE OWNER.
- G10. **COORDINATION:** COORDINATE WORK AND SCHEDULING WITH ALL OTHER TRADES.
- G11. **PRODUCTS:** ALL PRODUCTS SHALL BE NEW, U.L. APPROVED, AND OF A SPECIFICATION GRADE. NEW PRODUCTS OF A SIMILAR NATURE SHALL BE OF THE SAME TYPE AND MANUFACTURER. PROVIDE THE STANDARD PRODUCTS OF MANUFACTURERS REGULARLY ENGAGED IN THE PRODUCTION OF SPECIFIED PRODUCTS, UNLESS OTHERWISE REQUIRED BY DRAWINGS. ALL PRODUCTS SHALL BE CONSTRUCTED AND INSTALLED IN ACCORDANCE WITH NATIONALLY RECOGNIZED AND ACCEPTED STANDARDS AND PROCEDURES. COMPLY WITH ALL MANUFACTURERS' REQUIREMENTS AND RECOMMENDATIONS.
- G12. **IDENTIFICATION:** ALL ELECTRICAL DISTRIBUTION EQUIPMENT, PANELBOARDS, AND OTHER ENCLOSED EQUIPMENT SHALL BE IDENTIFIED AS INDICATED IN THE CONTRACT DOCUMENTS.
- BRANCH CIRCUIT IDENTIFICATION:** EACH BRANCH CIRCUIT OVERCURRENT PROTECTION DEVICE SHALL BE IDENTIFIED BY CIRCUIT NUMBER AND SCHEDULED INSIDE PANEL DOOR. EACH BRANCH CIRCUIT SPLICE OR TERMINATION SHALL BE IDENTIFIED BY PANEL AND CIRCUIT DESIGNATION SHOWN ON THE JUNCTION OR OUTLET BOX, OR UPON INDIVIDUAL WIRES IN CASES WHERE MORE THAN ONE OF EACH PHASE CONDUCTOR OCCUR. EACH CONDUCTOR TERMINATION SHALL BE IDENTIFIED BY NUMBER AT EACH DEVICE, INSIDE BOX, OR WIRE BY APPROVED MEANS.
- G13. **WIRING:** ALL CONDUCTORS CARRYING GREATER THAN 50 VOLTS SHALL BE MINIMUM #10 AWG, SOLID COPPER, SOFT DRAWN OF 98% CONDUCTIVITY, UNLESS NOTED OTHERWISE. CONDUCTORS OF SIZE #8 AWG OR LARGER SHALL BE CONCENTRIC LAY STRANDED. PROVIDE MINIMUM #14 AWG CONDUCTORS, CARRYING LESS THAN LINE VOLTAGE, FOR COMMUNICATIONS, CONTROLS, OR LOW VOLTAGE LIGHTING, UNLESS NOTED OTHERWISE.
- ALUMINUM WIRING:** ALUMINUM CONDUCTORS MAY BE USED ONLY FOR LINE SIDE OF SERVICE TO MAIN PANEL MP AND PANEL P. ALL OTHER CONDUCTORS ON LOAD SHALL BE COPPER.
- INSULATION:** PROVIDE TYPE THW, THWN, THHN, OR XHHW TYPE INSULATIONS. COORDINATE INSULATION TYPES WITH CONDITIONS, NEC REQUIREMENTS, AND CONDUIT FILL REQUIREMENTS. ALL WIRING SIZES ARE BASED ON 60C OR 75C INSULATION ACCORDING TO CURRENT, REGARDLESS OF ACTUAL INSULATION USED. COMPLY WITH ALL UL "GREEN BOOK" REQUIREMENTS. REFERENCE CONDUIT NOTES BELOW.
- HOMERUNS:** PROVIDE MINIMUM #10 AWG WIRING ON ALL 120 V HOMERUNS 100 FEET OR GREATER.
- NEUTRALS:** SIZE ALL NEUTRALS FULL UNLESS SPECIFICALLY REDUCED ON PLANS. PROVIDE SEPARATE NEUTRALS (DO NOT SHARE) UNLESS NOTED OTHERWISE.

120/240V, 1 PHASE, 3 WIRE  
PHASE A - BLACK  
PHASE C - BLUE  
NEUTRAL - WHITE  
GROUND - GREEN

- G14. **GROUNDING:** ALL BRANCH CIRCUITS AND FEEDERS SHALL BE RUN WITH AN INSULATED GREEN COPPER GROUND WIRE. THE USE OF CONDUIT AS THE ONLY EQUIPMENT GROUND IS UNACCEPTABLE.
- G15. **RACEWAYS:** ALL WIRING SHALL BE IN CONDUIT. MINIMUM 1/2" EMT CONDUIT IS ACCEPTABLE INDOORS FOR SIZES UP TO 3" IN DIAMETER.
- FLEXIBLE METAL CONDUIT** MAY BE USED FOR LIGHT FIXTURE WHIPS AND FLEXIBLE CONNECTIONS TO EQUIPMENT. LENGTH OF FLEXIBLE CONDUIT SHALL NOT EXCEED 6'. CONDUIT SHALL BE LIQUID-TITE IN DAMP OR WET LOCATIONS.
- ENT, NM ("ROMEX"), NMC, AND SNM** ARE NOT ACCEPTABLE. TYPE MC CABLE SHALL BE PERMITTED WHERE ALLOWED BY OWNER AND AHJ.
- RIGID CONDUIT:** CONDUIT OVER 3" IN DIAMETER, OR EXPOSED TO WEATHER, OR EXPOSED TO POTENTIAL DAMAGE, OR USED FOR SERVICE ENTRANCE SHALL BE GALVANIZED RIGID STEEL TYPE, UNLESS NOTED OTHERWISE. INTERMEDIATE METALLIC CONDUIT MAY BE ACCEPTABLE WHERE SPECIFICALLY ALLOWED FOR OR CALLED FOR BY ENGINEER.
- PVC CONDUIT:** PVC CONDUIT, MINIMUM SCHEDULE 40, IS ACCEPTABLE ONLY FOR USE BELOW GRADE, AND ONLY WHEN INSTALLED WITH WIDE RADIUS RIGID STEEL TURNS.
- ROUTING:** CONDUIT ROUTING SHOWN IS SYMBOLIC AND DIAGRAMMATIC. INSTALL CONDUIT TO FIT ACTUAL FIELD CONDITIONS. COORDINATE ROUTING WITH ENGINEER IN FIELD WHERE DRAWINGS DO NOT REFLECT ACTUAL CONDITIONS. NOTE SUCH CONDITIONS IN SHOP DRAWINGS. CONDUIT SHALL NOT BE RUN IN OR THROUGH DUCTWORK.
- FITTINGS:** USE ONLY FITTINGS APPROPRIATE FOR TYPES OF CONNECTIONS TO BE MADE. ALL FITTINGS SHALL BE COMPRESSION OR THREADED TYPE. USE OF SET SCREW FITTINGS IS ACCEPTABLE ONLY IF APPROVED BY OWNER AND LOCAL AUTHORITIES. FITTINGS FOR PVC, WHEN ALLOWED, SHALL BE APPROVED FOR USE WITH PVC AND WATERTIGHT.
- CONDUIT FILL:** CONDUIT FILL IS CALCULATED BASED ON TYPE THHN INSULATION AND CONCENTRIC STRANDED CONDUCTORS. IF ALTERNATE CONDUIT SIZING IS DESIRED BY CONTRACTOR BASED ON OTHER INSULATION, CONTRACTOR IS RESPONSIBLE FOR CALCULATING ALTERNATE CONDUIT SIZES, SUBJECT TO APPROVAL BY ENGINEER.
- G16. **DISTRIBUTION EQUIPMENT:** PROVIDE ONLY COMMERCIAL GRADE DISTRIBUTION EQUIPMENT PURCHASED FOR USE ON THIS PROJECT.
- PANELBOARDS:** PROVIDE WITH COPPER OR ALUMINUM BUSSING AND MAXIMUM 42 POLES PER PANEL SECTION. 120/240V PANELS SHALL BE EQUAL TO SQUARE D NQOD SERIES WITH HINGED COVER AND BOLT-ON BREAKERS.
- DISCONNECT SWITCHES:** PROVIDE HEAVY DUTY RATED DISCONNECT SWITCHES, FUSED OR NON-FUSED AS NOTED, AND VOLTAGE AS APPROPRIATE OR INDICATED ON PLANS, RATED AT 200,000 AIC.
- DISTRIBUTION EQUIPMENT ACCEPTABLE MANUFACTURERS:** SQUARE D, SIEMENS, G.E.
- OVERCURRENT PROTECTION DEVICES:**
- CIRCUIT BREAKERS:** ALL BRANCH CIRCUIT OVERCURRENT PROTECTION DEVICES (CIRCUIT BREAKERS) SHALL BE INVERSE TIME THERMAL MAGNETIC BOLT-ON CIRCUIT BREAKERS, RATED 20 AMPERES, UNLESS OTHER AMPACITY IS NOTED. MULTI-POLE BREAKERS SHALL BE INTEGRAL UNITS. USE OF HANDLE TIES IS NOT ACCEPTABLE.
- FUSES:** ALL FUSES 600 AMPERES OR LESS SHALL BE UL LISTED, CLASS J, CURRENT LIMITING, TIME DELAY, REJECTION TYPE, 200,000 AIC, 600 VOLT.
- FAULT CURRENT RATING:** ALL ELECTRICAL DISTRIBUTION EQUIPMENT SHALL BE FULLY RATED FOR THE A.I.C. RATING SCHEDULED. SERIES RATING IS NOT ACCEPTABLE.
- FUSE ACCEPTABLE MANUFACTURERS:** BUSSMANN, GOULD SHAWMUT (MERSEN).
- G17. **LOW VOLTAGE SYSTEMS WIRING:**
- ALL CONTROL SYSTEMS WIRING IN AREAS WITH GYPSUM BOARD CEILING AND AREAS WITH EXPOSED STRUCTURE CEILING SHALL BE INSTALLED IN EMT CONDUIT.
- UNLESS NOTED OTHERWISE, ALL CONTROL SYSTEMS WIRING SHALL BE CONCEALED IN WALLS AND ABOVE CEILING SPACE. ALL WIRING SHALL BE SUPPORTED VIA BRIDLE HOOKS. BRIDLE HOOKS SHALL BE INSTALLED THROUGHOUT FACILITY ON 6'-0" CENTERS.
- G18. **PENETRATIONS OF RATED PARTITIONS:** INSTALL FIRE PROOFING AROUND ALL PENETRATIONS TO SMOKE RATED AND FIRE RATED WALLS. REFER TO ARCHITECTURAL DRAWINGS.
- G19. **PROJECT RECORD DOCUMENTS:** UPON COMPLETION OF WORK, PREPARE LIGHTING AND POWER PROJECT RECORD DOCUMENTS ("AS-BUILTS") ON CAD USING AUTOCAD RELEASE 2010. PRESENT COMPLETED CAD DRAWINGS AND ONE HARD COPY TO OWNER, AND COMPLETED CAD DRAWINGS AND TWO SETS OF PRINTS TO ENGINEER. "AS-BUILT" DRAWINGS SHALL INCLUDE ALL BRANCH CIRCUIT WORK, ALL PANELBOARD INFORMATION AVAILABLE, FINAL SWITCHING, AND ALL SUBMITTAL AND SHOP DRAWING MATERIALS.
- G20. **WARRANTY:** WARRANT ALL MATERIALS, EQUIPMENT, AND INSTALLATION FOR A PERIOD OF ONE YEAR FROM DATE OF ACCEPTANCE BY OWNER.

#### GENERAL LIGHTING NOTES

- L1. **FIXTURES TYPES:** IN GENERAL, FIXTURE TYPES ARE TO BE AS SPECIFIED OR APPROVED EQUAL. VERIFY REQUIREMENTS WITH OWNER.
- L2. **DESIGNATIONS:** REFERENCE LIGHTING FIXTURE SCHEDULE AND REFLECTED CEILING PLAN FOR COMPLETE DESCRIPTION OF EACH FIXTURE TYPE. LIGHT FIXTURES ARE IDENTIFIED BY LETTERS AND SYMBOLS.
- L3. **ALL INTERIOR LIGHTING** SHALL BE CONTROLLED BY TIMECLOCK OR OCCUPANCY SENSORS AS SHOWN ON THE DRAWINGS.
- L4. **SWITCH LOCATIONS:** TYPICAL SWITCHING SHALL BE LOCATED INSIDE EACH ROOM NEAR THE STRIKE SIDE OF EACH DOOR, UNLESS OTHERWISE SHOWN OR NOTED ON PLANS. MOUNT SWITCHES AT 48" AFF OR AS DIRECTED BY OWNER.
- L5. **SWITCHES:** PROVIDE SPECIFICATION GRADE TOGGLE STYLE, SILENT SWITCHES, RATED 20 AMPERES, 120 VOLTS. PROVIDE POLE AND THROW COMBINATIONS AS INDICATED.
- L6. **PLATES:** PROVIDE SWITCH PLATES OF TYPE AND COLOR AS DIRECTED BY OWNERS REPRESENTATIVE.
- L7. **APPROVED MANUFACTURERS:** HUBBELL, LEVITON, PASS & SEYMOUR, OR APPROVED EQUAL.
- L8. **EXIT SIGNS:** PROVIDE EXIT SIGNS PER LIGHT FIXTURE SCHEDULE WITH INTEGRAL 90 MINUTE BATTERY BASED EMERGENCY POWER SOURCE WITH BATTERY INDICATOR LIGHT AND TEST SWITCH.
- L9. **FIXTURE LOCATIONS:** REFERENCE REFLECTED CEILING PLAN FOR EXACT LOCATIONS OF LIGHT FIXTURES. COORDINATE INSTALLATION IN FIELD WITH OWNER AND ENGINEER.
- L10. **INSTALLATION:** WIRE FROM JUNCTION BOXES TO FIXTURES OR SWITCHES AS INDICATED. ADDITIONAL JUNCTION BOXES MAY BE REQUIRED BEYOND THOSE SHOWN.
- L11. **SUPPORT:** SUPPORT ALL FIXTURES FROM GYPBOARD CEILING OR FROM STRUCTURE ABOVE.
- L12. **ENERGY EFFICIENCY:** ALL FLUORESCENT AND EXIT SIGNS SHALL BE ENERGY EFFICIENT TYPE. ALL FLUORESCENT FIXTURES SHALL HAVE ELECTRONIC BALLASTS.
- L13. PROVIDE BALLAST DISCONNECTING MEANS PER NEC 410.73G.

#### GENERAL POWER NOTES

- P1. **GENERAL:** VERIFY EXACT LOCATION OF OUTLETS AND DEVICES WITH OWNER PRIOR TO ROUGH-IN. PROVIDE OUTLETS BOXES, DEVICES, COVERPLATES, AND FLANGES AS REQUIRED.
- P2. **COORDINATION:** MOUNT ALL OUTLETS AT HEIGHT AND ORIENTATION AS SHOWN ON PLANS. MOUNT ALL OUTLETS ABOVE COUNTERTOPS HORIZONTALLY. COORDINATE ALL HEIGHTS, DIMENSIONS, AND CONFIGURATION OF DEVICES NOT INDICATED ON THESE DRAWINGS WITH OWNER.
- P3. **CONVENIENCE OUTLETS:** ALL CONVENIENCE OUTLETS SHOWN SHALL BE NEMA TYPE 5-20R. SPECIFICATION GRADE DUPLEX RECEPTACLES (HUBBELL #5352 OR EQUAL) WITH COVERPLATES OF TYPE AND COLOR AS DIRECTED BY OWNERS REPRESENTATIVE. INSTALL AT ADA REQUIRED 18" AFF, UNLESS NOTED OTHERWISE.
- P4. **GFI RECEPTACLES:** ALL GROUND FAULT INTERRUPT (GFI) DEVICES SHALL BE RATED AT 20 AMPERES AND SHALL HAVE A DEDICATED GREEN GROUND WIRE. THE GROUND WIRE SHALL BE RUN CONTINUOUS AND UNSPLICED BETWEEN DEVICE AND PANEL GROUND BUS.
- P5. **INSTALLATION:** DROP FROM JUNCTION BOXES TO DEVICES AS INDICATED. ADDITIONAL JUNCTION BOXES MAY BE REQUIRED BEYOND THOSE SHOWN.
- P6. **SPECIAL RECEPTACLES:** VERIFY ALL EQUIPMENT RECEPTACLE REQUIREMENTS. PROVIDE PLUGS, CORDS AND RECEPTACLES AS REQUIRED. VERIFY ALL SPECIAL RECEPTACLES UPON ARRIVAL OR EQUIPMENT. FURNISH ADDITIONAL RECEPTACLES WHEN NECESSARY.
- P7. **EXPOSED EQUIPMENT:** EQUIPMENT EXPOSED TO WEATHER SHALL BE WEATHERPROOF, NEMA 3R, OR AS SPECIFIED ON PLANS.
- P8. **CONTROL WIRING:** PROVIDE CONTROL WIRING AND CONDUIT FROM ALL NECESSARY AIR CONDITIONING CONTROLS. VERIFY EXACT REQUIREMENTS WITH EQUIPMENT SUPPLIER, HVAC CONTRACTOR, AND OWNER.