ELECTRICAL SPECIFICATIONS GENERAL PROVISIONS:

All labor, materials, equipment transportation, construction plant and facilities necessary for the proper execution and completion of the work as defined and required by the Contract Documents. Also, all work not specifically included in the Contract Documents which is reasonably and properly inferable there from or accepted trade practice necessary for the proper completion of this work.

The electrical scope of work shall include, but is not limited to the following major components, products and complete operable systems:

* Modifications to existing distribution system including panelboards
* Branch circuit conductors, conduit and disconnects, etc.
* Lighting fixtures, lamps, ballasts and controlling devices
* Convenience and power outlet systems
* Voive/data outlet rough-in
* Power connections to all heating, ventilating and air conditioning equipment
* Additions and modifications to fire alarm system
* Surface mounted raceway systems.

ELECTRIC SERVICE:

The existing electric service both 480y/277 volt and 208y/120 volts shall be used to serve new loads for this project.

PERMITS, CODE REQUIREMENTS AND FEES:

All work shall conform to the rules and regulations of the latest edition of the National Electrical Code, including all subsequently published addenda thereto. Include all items of labor and materials required to meet such Code regulations regardless of the failure to mention in the in the specifications or show on the drawings each individual item.

The work shall also conform to the latest established standards of the Institute of Electrical Electronic Engineers (IEEE), National Electric Manufacturer's Association (NEMA); National Electric Code and all State, and local codes.

The foregoing standards shall be followed by the Contractor as minimum requirements; They shall not relieve the Contractor from furnishing and installing higher grades of materials and workmanship that may be specified herein or indicated on the drawings.

Take out all required permits and pay all fees in connection with work under this Division.

ACCURACY OF DATA, DRAWINGS AND INTERFERENCES:

Electrical drawings are intended to indicate only the extent diagrammatically, general character and location of the work included. Work intended, but having minor details obviously omitted or not shown shall be furnished and installed complete to perform the functions intended.

Examine carefully all contract drawings as well as the electrical drawings. Install equipment as nearly as possible to the locations and arrangements as indicated. Provide minor adjustments as necessary to coordinate the electrical work with the Architectural and Mechanical systems and to avoid all interferences therewith. All offsets, rises, pull boxes and fittings are not necessarily shown on the drawings; however, these shall be provided as required.

PRODUCTS:

Materials and workmanship in the installation shall be of the best for the purpose intended and shall meet with the approval of the Architect. The Architect reserves the right to reject any materials and workmanship not in accordance with those specified or not meeting the Architects approval, either before or after installation.

All materials shall be new, with UL label where available. If UL label is not available, material shall be manufactured in accordance with applicable NEMA, IEEE and Federal Standards. Labeled products shall be utilized and installed per manufacturer's instructions so that labeling is not violated.

SUBMITTALS

Prior to ordering any equipment, the electrical contractor shall furnish for the Architect's approval seven sets of submittal brochures. Submittals shall include the following: fire alarm devices, lighting fixtures and lamps, wiring devices/cover plates, wire/cable, boxes, conduit systems, junction boxes, fittings, seismic restraint products, wall and conduit fire stops materials.

Submittals shall include Contractors name and telephone number, Distributors name and telephone number, Manufacturer's name and product, catalog cut-sheets complete with product descriptions, weights, dimensions and all applicable device ratings (volts, amps, watts, interrupting ratings, etc.)

TEMPORARY UTILITIES:

All temporary wiring for construction power shall conform to Article 527 of NEC and all applicable rules and regulations of OSHA.

TESTING AND ADJUSTMENTS:

All wiring shall be so installed that when completed, the system will be free from short circuits and grounds except as allowed by Article 250 of National Electrical Code.

Check and adjust all equipment to operate smoothly, quietly and in accordance with manufacturer's installation, maintenance and start-up instructions.

All auxiliary and cable systems shall be tested for proper operation. Owner's personnel shall be thoroughly familiarized with the proper operating procedures for each system.

WORKMANSHIP, GUARANTEE (QUALITY ASSURANCE):

Work under this Division shall be first class with emphasis on neatness and workmanship. Install work using competent mechanics, under supervision of foreman, all duly certified by local authorities. Installation is subject to Architects periodic observation, final approval, and acceptance. All unsuitable work will be rejected.

Provide one year warrantee on all materials and workmanship furnished under this contract.

BASIC MATERIAL AND METHODS

CONDUITS:

All conduit 2-1/2" and larger shall be hot-dipped galvanized rigid steel conduit of high grade, open hearth, welded steel pipe of standard weight conforming to Federal Specifications WWC-581, ANSI C80.1 and UL Standard #6. All conduit 2" and smaller shall be EMT Electric Metallic Tubing.

The last 36" of conduit to motors and transformers and other vibrating equipment shall be liquid-tight, flexible electrical conduit with internal grounding conductor as sized by Code.

All conduits shall be 1/2" minimum diameter.

Couplings and connectors for all EMT conduit systems shall be set screw type of galvanized or shearardized steel (Die cast fittings, will not be acceptable). Fittings shall be concrete tight. Fitting installed in wet locations shall be rain tight.

All rigid steel conduit fittings shall be threaded galvanized steel.

MC cable is not an acceptable wiring method for this project.

WIRE AND CABLE:

All feeders and branch circuit wiring shall be type THWN suitable for 75 degree C normal conductor operation and shall be rated 600 volts of not less than 12 gauge except where noted differently. All wire and cable shall be stranded, all conductor sizes. Wire and cable color coding shall be as follows: 120/208 volts, black, red, blue, white and green.

WIRING DEVICES:

Devices where possible shall be of the same manufacturer and shall be as manufactured by Hubbell, Cooper, Leviton or Pass & Seymour. All wiring device colors shall be selected by Architect.

Wall switches in general shall be installed 48" above the floor on the strike side of the door. Switches shall be quiet operating, heavy duty specification grade, rated 20 amps, 120/277 volts, A.C. Switches shall be designed for back wiring with stranded wire. Switch mounting straps shall be brass with grounding screw terminal. Switches shall be Leviton as follows: #1221 series.

Duplex outlets shall be heavy duty specification grade of the polarized grounding type. Devices shall be designed for back wiring with stranded wire. Device mounting straps shall be brass with grounding screw terminal. Devices shall be Leviton Catalog #5362 rated 20 amps, 125 volts.

Ground fault circuit interrupting outlets shall be heavy duty specification grade, 20 amp, 125 volt. Devices shall be designed for back wiring with stranded wire and shall have brass mounting straps and grounds screw terminal. Outlets shall have UL lockout feature that prevents a device from being reset if improperly wired and when device malfunctions. Devices shall be Leviton #7899 series with LED indicator.

Device plates for switches and outlets shall be smooth polycarbonate (thermoplastic) of the configurations required for device, Mulberry Endura Series or reinforced nylon Leviton 80700-TP series. Device plates shall have color as selected by Architect.

ELECTRICAL SUPPORTING DEVICES:

Furnish and install all necessary hangers, supports, fasteners, platforms, frames and all other similar construction materials necessary for the proper and safe support of all conduit and equipment furnished under this Division of the Specifications.

Supports for lighting fixtures, panelboards, exposed feeders, etc., shall be UL approved. Lighting fixtures shall not be supported from the ceiling framing system.

Conduit shall be securely supported, strapped, or otherwise attached to the building structure in an approved manner. Conduit shall be firmly fastened within 3 feet of each outlet box, junction box, cabinet or fitting. Conduit shall be supported at intervals not to exceed those specified in Chapter 3 of National Electric Code. Conduits shall not be supported by ceiling or grid wire of lay-in ceiling.

All conduits shall be supported independently from ceiling system with approved supports. Tie wire is not an approved support.

Grouping of homeruns shall be limited to three phase conductors, neutral and ground unless shown otherwise on drawings. No grouping of 3 phase circuits will be allowed except where noted on drawings.

PULL BOXES, OUTLET BOXES AND FITTINGS:

Pull boxes or junction boxes, where shown on the drawings or where required to facilitate pulling of wires or cables, shall be of proper size and shape as required by Section 370 of NEC.

All metallic conduit fittings shall be galvanized or cadmium plated, adapted to type of conduit system installed. Fittings shall meet all requirements for the Underwriter's Laboratories, Inc., and the National Electrical Code.

Each switch, light, receptacle, and other miscellaneous device shall be provided with an outlet box. Boxes shall have only the holes necessary to accommodate the conduit at point of installation. All boxes shall have ears to secure covers.

Ceiling outlet boxes, where used with conduit that is concealed, shall be not less than 4" in diameter by 1-1/2" deep.

All boxes shall be rigidly secured in position. All concealed boxes for fixtures, switches, receptacles, telephone, etc., shall be so set that the front edge of box shall be flush with finished wall or ceiling line. When located near doors or windows, they shall be close to trim. Wall switches at the door locations shall be installed on lock side of the door.

Plaster flanges and masonry trim rings for outlet and switch boxes shall be of proper depth to match face of finished wall or within 1/8" maximum setback.

HVAC AND PLUMBING EQUIPMENT WIRING

All power wiring to operate the HVAC equipment shall be furnished by the Electrical Subcontractor, except wiring that is factory installed on equipment.

All control wiring including conduit, wire and devices to operate the HVAC and Plumbing systems including interlock wiring shall be furnished and installed under Division 15. Provide 20 amp, 120 volt control circuit to each control panel specified or detailed in contract documents.

All motor starters for HVAC equipment shall be furnished under Division 15 to be mounted under this Division if not factory mounted on equipment.

All duct mounted smoke detectors required for HVAC equipment shall be furnished under this Division with contacts as required for HVAC fan shut down. Installation of duct mounted detectors shall be by Division 15.

OWNER FURNISHED EQUIPMENT CONNECTIONS:

Furnish and install all necessary outlets, disconnects, wiring and connections for Owner furnished equipment and its control as required. Locations of stub-ups on drawings for said equipment are approximate. Exact locations shall be as instructed by the Owner and equipment supplier. All equipment shall be set in place ready for electrical connection.

CONDUIT FIRE STOPS:

Furnish and install on all conduit penetrations of fire walls, fire stops as manufactured by 3M or equal with UL rating equal to rating of wall penetrated.

SEISMIC RESTRAINT

All electrical equipment shall be seismically supported and protected per local Code requirements.

All equipment requiring seismic restraint must include verifying calculations and analysis performed by a licensed professional engineer in the State of Tennessee. Products shall be of similar to those furnished by Mason Industries, Inc. as represented by Gorham/Shaffler in Memphis, TN, telephone number (901) 345-6100.

PREFABRICATED LIGHTING AND OUTLET PANELBOARDS:

Contractor shall reuse existing circuit breakers and fused switches in panelboards and distribution panels as shown on drawings. Furnish new fuses and/or circuit breaker as noted and required. New breakers if required shall match existing manufacture, type and interrupting ratings.

Provide new type written circuit directories for all panels where circuits are modified or added.

SAFETY SWITCHES:

Safety switches shall be heavy duty, NEMA type "HD" fusible or nonfusible as indicated. Switch mechanism shall be quick-make, quick-break. Cover shall be interlocked with mechanism to prevent opening unless switch is on the "OFF" position.

SWITCHGEAR INSTALLATION:

Switchgear shall be installed as per switchgear manufacturer's recommendations and as required by the National Electrical Code. All electrical equipment shall be installed with vertical and horizontal clearance per NEC Articles 110 and 408. Plumbing, ductwork and other non-electrical equipment shall not be installed within the spaces dedicated to electrical equipment.

Internal parts of electrical equipment, including busbars, wiring terminals, insulators and other surfaces, shall not be damaged or contaminated by foreign materials such a paint, plaster, cleaners or corrosive residues.

LIGHTING FIXTURES:

General: Furnish and install complete in all respects all lighting fixtures and lamps as listed in the Fixture Schedule and/or as specified hereinafter.

Lamps shall be as described and scheduled in the Fixture Schedule. General use fluorescent lamps shall be T-8 unless noted differently. All fluorescent lamps shall be of the reduced mercury type, TCLP-compliant containing less than 3.8mg of mercury similar to Phillips Alto or approved equal.

Fluorescent lighting fixtures shall have an electrostatically applied white POLYESTER powder high temperature baked enamel finish applied after fabrication, with a minimum reflectance of 90%. Metal shall be properly cleaned and have an iron phosphate coating with rust inhibiter, applied before enamel coating. Fixture shall have a photometric efficiency of at least 70%.

Fluorescent Ballasts shall be solid state electronic energy saving, program start for use with occupancy sensor controls.

All fluorescent ballasts shall have 5 year warranty with a fixture replacement. Ballasts shall be Motorola, Advance or Magnetek.

LIGHTING FIXTURE INSTALLATION:

Provide all steel straps, hangers, mounting rings and accessories required for installation of lighting fixtures. Verify ceiling types prior to ordering fixtures to insure proper flanges, mounting arrangements, etc. Furnish proper ceiling slope adapters and ceiling thickness adapters as required.

At completion of project, clean all fixtures, lenses and interiors, removing all construction debris and accumulated dust. Replace all damaged lenses, louvers and fixture trims. If light fixtures are used for construction lighting, all lamps shall be replaced with new lamps at time of final inspection.

Fixtures installed in hard ceilings must be UL listed for access from below. Light fixtures installed outdoors shall have appropriate damp or wet location listing.

Fixtures weighing 50 pounds or more shall not be supported from outlet box or ceiling grid system. These fixtures shall be independently supported from structure above.

Lay-in fixtures in grid type ceiling systems shall be independently supported at four corners from structure above.

FIRE ALARM SYSTEM

Furnish and install new fire alarm devices to match existing manufacturer Siemens. Verify with Owner the current fire alarm vendor/supplier. Include in electrical cost the cost of any fire alarm programming that may be required for new added devices.

Furnish and install as shown on the plans, wall mounted audio/visual appliances with white lens, red "FIRE" lettering and Xenon flasher that complies with ADA requirements.

Furnish duct mounted smoke detectors with sampling tubes as required by mechanical drawings. Duct detectors shall match existing manufacturer and device type. If detector is installed in an inaccessible location, provide remote test/monitor panel as required by local fire department.

FIRE ALARM INSTALLATION

All fire alarm systems and associated devices shall be furnished by a factory authorized supplier. All fire alarm devices shall be of the same manufacturer or shall be UL system listed for use with main control panel and all other components.

Fire alarm contractor must be certified in accordance with the Tennessee Alarm Contractors Licensing Act of 1991, TCA Title 62 Chapter 32.

Contractor shall take out all necessary permits and pay all fees associated with fire alarm system.

Fire alarm system shall be installed in accordance with manufacturer's recommendations using wiring diagram prepared by manufacturer showing in one line form all wiring and conduit requirements including power wiring. Fire alarm system shall receive a final check in the presence of the Owner's representative to show proper operation of systems.

All fire alarm wiring shall be installed in conduit. Wiring shall be of the size, type and rating as recommended by the fire alarm manufacturer. All communication circuit conductors shall be shielded. All wiring shall meet the requirements of all national, state and local electrical codes. The sizes and color coding of wires shall be tagged at all junction points and shall test free of grounds or shorts between conductors. All wiring shall be as required by Article 760 of NEC.

Install fire alarm visual appliances in accordance with NFPA and ADA requirements. Strobe intensities, location and spacing shall be as required by NFPA-72 for a minimum 0.0375 lumens per square foot.

Where multiple visual appliances are installed in a single space, all strobes shall be synchronized to flash at the same time. Flash rate shall be in accordance with Code requirements.

Duct mounted smoke detectors and sampling tubes shall be installed in duct work of all RTU's, AHU's and at combination fire and smoke dampers by Division 15 Contractor. Locations shall be as required by NFPA 72E and as approved by the local Fire Department. Detectors shall be furnished to Division 15 including housings and sampling tubes for installation in duct work. Wire and conduit from smoke detector or control relays to unit control enclosure shall be by Division 16, final connection to control circuit shall be by Division 15.

Upon completion of the installation and Fire Marshal testing of fire alarm system, furnish System certification as required by NFPA 72, paragraph 2-2, "Documentation", sub-paragraphs 2-2.1 through 2-2.3. This paragraph covers the following general items on fire alarm system Final approval documentation, Approval/Acceptance, Certificate of Compliance, Owner's Manual, As-built drawings.

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REGISTERED ENGINEER
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STATE OF TENNESSEE

SEPT. 16, 2013

Revision	Description	Date
Revision	Description	Date
Revision	Description	Date
Revision	Description	Date

NEW COURTROOM LL188

SHELBY COUNTY JUSTICE CENTER

201 POPLAR AVENUE

MEMPHIS, TENNESSEE

Sheet Title: ELECTRICAL SPECIFICATIONS

Project No.: 13009

Drawing File No.: 130206

Drawn by: MLD

Date: SEPT. 16, 2013

Sheet No.: E1.3