

DIVISION 16 ELECTRICAL

I. GENERAL

- A. All materials and workmanship shall comply with all applicable local, county, state, and national codes, ordinances, utility company regulations, and specified industry standards.
- B. In cases of differences between building codes, state laws, local ordinances, industry standards and utility company regulations and the Contract Documents, the most stringent shall govern. Any work involved with these differences shall be performed at no additional cost to the Owner.
- C. In addition to the above, if the following industry standards and codes are more stringent, they shall take precedence.

IEEE - Institute of Electrical and Electronic Engineers  
 IES - Illuminating Engineering Society  
 NEC - National Electric Code (2005)  
 NEMA - National Electric Manufacturer's Association  
 NFPA - National Fire Protection Association  
 UL - Underwriter's Laboratory

- D. All work shall be performed in a neat and workman-like manner. Any work found to be unsatisfactory by the Architect or Engineer shall be removed and reinstalled immediately at no additional cost.
- E. Contractor shall provide all items of labor and materials to make a complete installation of electrical work, as shown on the drawings, as specified, and as necessary for a complete system, including, but not limited to the following:

- (1) Power and control power for heating, ventilating, and cooling systems. Refer to Division 15.
- (2) All wiring devices, including safety switches and time switches.
- (3) All lighting fixtures, and emergency lighting fixtures, with lamps included.
- (4) All electrical conductors and conduit.
- (5) Telephone conduits and plywood backboards.
- (6) Addressable Fire Alarm System.

F. FEES AND PERMITS

- (1) Each contractor shall obtain all permits, inspections, and approvals applicable to this trade, as required by regulatory authorities. All fees and costs of any nature whatsoever incidental to these permits, inspections and approvals shall be assumed and paid by the Contractor. The General Building Permit will be obtained under other sections of the work and that portion of the costs involved in obtaining this permit will be paid by the contractor for the electrical trade. The pro-rata costs, if any, of utilities serving this property will be paid for by the Owner and shall not be included as part of this Contract.

G. DRAWINGS AND SPECIFICATIONS

- (1) The interpretation of the specifications, drawings and schedules shall be as hereinbefore described in the Architectural Section of the Specifications.
- (2) The "Scope of Work" as hereinbefore stated, is intended to designate the general description of the work which shall be performed by each of the major sub-contractors. It is not intended to include all items of work, either generally or specifically, nor is it intended to limit the scope of the work where plans, schedules, notes or standard practices require the inclusion of other specified items.
- (3) When the drawings do not give exact details as to the elevations of pipe, conduit and ducts, the contractors shall physically arrange the systems to fit in the space available at the elevations intended with proper grades for the functioning of the systems involved. Piping, exposed conduit and the duct system are generally intended to be installed true and square to the building construction, and located as high as possible against the structure in a neat and workman-like manner. Work shall be concealed in all finished areas.
- (4) Different electrical outlets, devices, etc. are indicated by symbols scheduled on drawings. Approximate locations are shown, however, the Architect reserves the right to make reasonable changes in locations without additional cost.
- (5) Lines indicating branch circuits do not show exact routing but indicate the arrangement and control of circuits. Conceal raceways (unless otherwise noted) and run in the most direct manner between cabinets, outlets, etc.

H. ELECTRICAL WIRING OF MOTORS AND EQUIPMENT

- (1) The Electrical Contractor shall wire all interlock and all power wiring for the installation of equipment furnished under other sections of the work. The Electrical Contractor shall furnish all disconnect switches as required for the proper operation of the equipment unless such equipment is specified to be factory mounted.
- (2) The Mechanical Contractor will furnish complete wiring diagrams showing power wiring and interlock wiring. Diagrams shall be submitted to the Engineer for approval within thirty (30) days after the submittals for equipment have been approved. Diagrams shall be based on the approved equipment and shall be a complete set of integrated drawings, not a series of manufacturers individual diagrams. After these diagrams have been approved by the Engineer, copies will be furnished to the Electrical Contractor by the Mechanical Contractor. They shall be followed in detail.
- (3) Each contractor shall note that the electrical design and drawings are based on the equipment scheduled and shown on the drawings and should any Mechanical Contractor submit for approval, equipment requiring changes to the electrical design for which the Electrical Contractor will request extra charges, these charges shall be paid by the contractor providing the equipment requiring the change.
- (4) At job completion, the Mechanical Contractor, Electrical Contractor, and Temperature Control Sub-contractor shall meet at the job site and shall jointly inspect, check out and test each control circuit, interlock circuit and power circuit to each piece of equipment. The Architect, Engineer and Owner shall be advised in writing of the time and date of this inspection in sufficient time to allow them to make arrangements to have a representative present if desired. A mutual agreement shall be prepared, in writing, between the Temperature Control Sub-contractor, Mechanical Contractor and Electrical Contractor, each of whom shall sign a document indicating that the system as installed and as they observed in functioning that day will meet the requirements of the plan and specifications and that they will unconditionally guarantee continuous performance for the guaranteed period as hereinafter specified.

I. EQUIPMENT IDENTIFICATION

- (1) All major equipment such as panelboards, disconnects, and other similar equipment shall be identified by the attachment of name plates constructed from laminated 3 ply engraved phenolic plastic, with black surface and white interior core at least 1/16" thick. Engraved lettering shall be condensed gothic at least 3" high and properly spaced for easy and legible reading. Plates shall be attached to equipment by the use of a permanent type adhesive of chromium plated screws.
- (2) Complete all identification cards for switches, starters, panelboards, and similar pieces of equipment, on a typewriter in a neat manner and insert the card in the card holders behind a sheet of clear plastic. Panelboard schedules shall list circuit number and specific room(s) name and number served.
- (3) The Contractor shall provide and install on the service entrance equipment an engraved plastic nameplate as hereinbefore described indicating the name, address, and phone number of both the installing contractor and the Electrical Engineer.

J. SUPPORTS AND HANGERS

- (1) All horizontal runs of conduit shall be suspended from the structural members above, by means of approved hangers. Supports and hangers shall be installed to permit free expansion and contraction in the conduit system as necessary. No conduit shall be self-supporting nor shall it be supported from the equipment connections. Branch circuit conduit runs above suspended ceilings must be fastened to the building structure independent of the suspended ceiling system. No wire nor any other building system shall be connected to or supported from the conduit system.

K. OBSERVATION

- (1) The purpose of the Observation is to determine whether the contractor is performing the work in a proper and workman-like manner, that he is apparently installing the work in accordance with the intent of the drawings and specifications and that in the Architect and Engineer's opinion the work is satisfactory.

L. GROUNDING

- (1) The Electrical Distribution System shall be grounded in accordance with the most current version of the National Electrical Code and Local Ordinances.

M. PANELBOARDS

- A. Furnish and install panelboards of capacities, AIC rating and quantity of poles as shown in panelboard schedules and as scheduled on drawings.
- B. Panelboards shall consist of a can, front, interior and circuit protective devices and shall be labeled as listed by Underwriter's Laboratories. The gauge of metal used and the gutter space shall be in accordance with applicable UL Standards and the National Electrical Code. Each panel shall have a door mounted on semi-concealed hinges with a cylinder lock, and keyed to a master key system.

N. BRANCH/FEEDERS FOR POWER AND LIGHTING

- A. Furnish and install all feeders and branch circuits as shown on drawings. Feeders shall be of type THN copper.
- B. All wiring shall be in conduit. Buried conduit may be of Rigid PVC with Rigid Galvanized Steel Elbows. If steel conduit is buried it shall be Rigid Galvanized Steel. All above floor conduit shall be EMT. The architect, engineer, and owner, must be notified in writing if EMT cannot be utilized for any reason, prior to installation.

All wiring exposed to the elements shall be raintight. All connections to motor-operated equipment shall have a suitable length of flexible conduit to isolate movement and noise transmission. Use flexible conduit for light fixture wiring where length is within limits as prescribed by code.

Conduit interconnections of lighting fixtures shall be from Joliet level. Do not extend runs horizontally from fixture to fixture.

Except where wiring is to power and /or lighting panels, main telephone panels and other electrical equipment at the main electric service panel location, all wiring shall be concealed within floors, walls, or partitions.

All wire of #6 AWG or smaller shall be factory color-coded. Where factory color is not available, mark conductors on each end with a 1 inch band of colored pressure sensitive plastic tape or by the use of a properly applied brilliant waterproof lacquer. Colors for each phase shall be consistent throughout the system. Color code shall be as follows:

120/208 Volts		120/208 Volts	
Phase A	Black	Phase A	Brown
Phase B	Red	Phase B	Orange
Phase C	Blue	Phase C	Yellow
Neutral	White	Neutral	Grey
Ground	Green	Ground	Green W/ Orange Trace

O. POWER CONTROL, WIRING FOR AC SYSTEMS

- A. Furnish, install, and connect all wiring in accordance with wiring diagrams for power and control of this equipment as provided by the H.V.A.C. Contractor. Refer to the Mechanical Specifications, Division 15. Contractor shall verify electrical requirements. No extra cost will be paid for additional equipment of labor after contract is signed.

P. WIRING DEVICES AND BRANCH WIRING

- A. Furnish and install all wiring devices for convenience receptacles, lighting, and telephone outlets, toggle switches and other similar devices. Convenience outlets shall be duplex type unless otherwise indicated. Faceplates and devices shall be white in color unless otherwise indicated. All wiring devices shall be specification grade 20 amp, 125 volt, as made by Leviton, Hubbell, or PNS, unless otherwise noted on the drawings.

(1) Switches

- (a) Wall switches controlling loads not more than 1920 watts at 120volts shall be as follows:

TYPE	15A LEVITON	20A LEVITON
SINGLE POLE	1201-2	1221-2
TWO POLE	1202-2	1222-2
THREE WAY	1203-2	1223-2
FOUR WAY	1204-2	1224-2
LOCK 1 POLE	1201-2L	1221-2L

(2) Receptacles

TYPE	TYPE
15 AMP-125 VOLT, 2 P/3W GROUNDING	20 AMP-125 VOLT, 2 P/3W GROUNDING
LEVITON 5261 (SINGLE)	LEVITON 5261 (SINGLE)
LEVITON 5262A (DUPLEX)	LEVITON 5262A (DUPLEX)

(3) GFCI Receptacles

The device providing Ground Fault Interruption Protection shall incorporate features that render the device incapable of being reset unless its proper operation is verified by the successful completion of the built-in supervisory test. Do not use feed-through feature.

TYPE

20 AMP-125 VOLT LOCK OUT TYPE:  
 LEVITON 8999

(4) Covers for Exterior Devices

TYPE

WEATHERPROOF COVERS:  
 LEVITON 4970

(5) White in Use

Shall have locking covers.

TYPE

LEVITON 5946-GY (1 DUPLEX RECEPTACLE)  
 LEVITON 5947-GY (1 GFCI RECEPTACLE)

(6) Coverplates

(a) Coverplates for each and every device shall be furnished and installed by this contract. All plates shall be one piece. No sectional plates will be allowed. All faceplates shall be specification grade and ivory in color. In machine rooms and other similar areas with exposed conduit furnish galvanized steel plates to fit in exposed boxes.

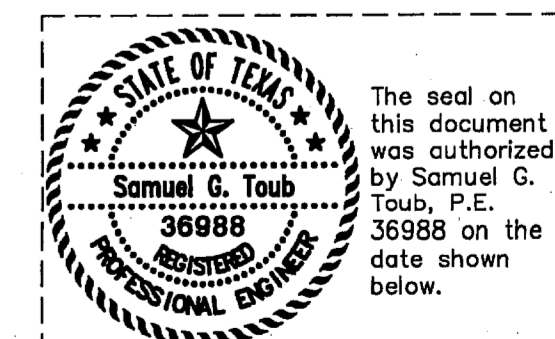
(b) Wall switches shall be ivory in color unless otherwise noted on the drawings. Switches shall be specification grade, 20 amp, 125 volt, as made by Leviton, Hubbell, or PNS.

(c) Floor Outlet boxes shall be galvanized boxes with brushed aluminum cover and access plug, unless otherwise shown on the drawings.

(d) All wiring to convenience outlets and lighting fixtures shall be a minimum of #12 AWG copper. THN type insulation for less than 5 conductors in conduit, and THHN type insulation for 6 or more conductors.

O. LIGHTING AND EMERGENCY LIGHTING FIXTURES

- A. Furnish, install and connect all lighting fixtures as scheduled on the drawings. Scheduled fixtures may have substitutions if the fixture is of equivalent or greater quality, design and if it is approved by the Owner. Each fixture shall be completely lamped. Unless otherwise scheduled, fluorescent lamps shall be T8 Osram 400K only. General duty incandescent lamps shall be frosted and shall be 120 volt unless otherwise scheduled. All lamps shall be General Electric, Phillips or Sylvania. Provide, install and connect emergency lighting fixtures as scheduled and shown on the drawings. Battery backup ballasts in emergency fixtures shall provide a minimum of 90 minutes of illumination in the event of a power outage.
- B. All fluorescent lighting shall be equipped with Electronic, High Frequency, Solid State Ballasts



2009.02.09  
 14:04:51 -06'00'

Project # 9788  
 S. Toub & Associates Inc.  
 Consulting Engineers Mechanical / Electrical  
 12841 Omega Road, Dallas, Texas 75244  
 972/396-5629  
 © COPYRIGHT 2008

architects  
**maa**  
 merriman  
 associates  
 architecture-planning  
 interior design  
 300 N. FIELD ST.  
 DALLAS, TEXAS 75202  
 214.987.1299  
 214.987.2138 (FAX)

JANI KING CALL CENTER  
 4393 SUNBELT DRIVE  
 ADDISON, TEXAS

© 2008  
 MERRIMAN ASSOCIATES  
 ARCHITECTS  
 P.L.L.C.

PROJECT NUMBER  
 2008195  
 DATE  
 FEBRUARY 9, 2009  
 SHEET NAME  
 NOTES, SYMBOLS  
 AND  
 ABBREVIATION

MEP1.03