

DIVISION 16 - ELECTRICAL

SECTION 16010 - GENERAL PROVISIONS

- 1. GENERAL
1.01 The following are minimum requirements and shall govern, except that building laws and/or drawings shall govern when their requirements are in excess thereof.
2. DRAWINGS AND SPECIFICATIONS
2.01 The architectural, mechanical, electrical and equipment drawings and specifications are hereby incorporated into and become a part of this Division.
2.02 Electrical drawings are diagrammatic and are intended to show the approximate locations of equipment and piping.
2.03 The exact locations of apparatus, fixtures, equipment and conduits shall be ascertained from the Owner's representative in the field, and the work shall be laid out accordingly.
2.04 The electrical drawings and specifications are intended to supplement each other and any material or labor called for in one shall be furnished and supplied even though not specifically mentioned in both.
2.05 The work required under these specifications includes all labor, materials, equipment and services necessary to provide lighting and power systems, service entrances, motor controls and connections, branch circuiting, feeders, panels, fixtures, wiring devices, and other items shown on the plans or specified.
2.06 When the specification of an item is not identified with a particular area, the item shall pertain to all areas.
2.07 This Contractor shall furnish such labor and materials as hereinafter specified and as required to complete all electrical connections in accordance with the manufacturer's requirements for all mechanical equipment and Owner's equipment as shown and/or specified.
3. EXAMINATION OF SITE
3.01 Bidder is to visit the site and familiarize himself with existing conditions and satisfy himself as to the nature and scope of work.
4. DEFINITIONS
4.01 "Install" shall mean to place, fix in position, secure, anchor, wire, etc., including necessary appurtenances and labor so that equipment or installation will function as specified and intended.
4.02 "Furnish" shall mean to purchase and supply equipment or components.
4.03 "Provide" shall mean to "furnish and install".
4.04 "Or approved equal" shall mean equal in type, design, quality, style, color, etc., as determined by the Engineer/Architect.
5. INTERFERENCES
5.01 It shall be the duty of this Contractor to report any interferences between his work and that of any other Contractor to the Owner or Architect as soon as they are discovered.
6. MATERIALS AND WORKMANSHIP
6.01 All work shall be installed in a practical and workmanlike manner by competent workmen, skilled in their branch of the trade.
6.02 Unless otherwise specified or indicated on the drawings, all materials shall be new and free from defects and shall be the best of their several kinds.
6.03 All material and equipment shall meet or exceed standards specified by UL, NEMA, ANSI and IEEE wherever such standards have been established.
6.04 From time-to-time during the operation and at the completion thereof, this Contractor shall remove all debris and excess materials caused by his work and he shall leave the area of the operation broom clean.
6.05 All electrical equipment and material shall bear the Underwriter's Laboratories label.
7. SUPPORTS
7.01 This Contractor shall furnish and install all angle iron, channel iron, rods, supports or hangers required to install or mount panelboards, switchboards, or any electrical equipment called for on the plans, in these specifications, or as necessary to mount any piece of electrical equipment, material, or device.

- 11.06 Installation
A. Degrease and clean surfaces to receive nameplates and tape labels.
B. Install nameplates and tape labels parallel to equipment lines.
C. Secure nameplates to equipment fronts using screws, rivets or adhesive.
D. Mark every junction or pull box cover plates with the circuit number(s) of all wires contained therein.
11.07 Wire Identification:
A. Provide wire markers on each conductor at terminal strips and at final line and load connections.
B. All wires shall be color coded.
12. GUARANTEE
12.01 In addition to guarantees of equipment by manufacturer of same, this Contractor shall also guarantee equipment provided by him and shall be held for a period of one (1) year to make good any defects in material and workmanship occurring during this period.
13. SCOPE OF WORK
13.01 Furnish all labor and material necessary to complete the electrical work shown on the drawings, specified herein or required to complete the construction of the building as shown.
13.02 The listing herein of article or material, operation or method, required to be provided and installed by the Contractor (unless noted to be supplied by others) shall be of quality or subject to qualifications as noted.
13.03 The electrical Contractor shall schedule his work to conform to the progress of the other trades and Contractors employed on this project.
13.04 The electrical work shall include but is not limited to the following:
A. Complete power and lighting distribution systems including panels, as shown on plans.
B. Complete branch circuit wiring system.
C. Temporary electric service as required for construction.
D. Testing of all electrical equipment.
14. MANDATORY SHOP DRAWINGS
14.01 Submit a minimum of five (5) copies of all required electrical shop drawings.
14.02 Shop Drawings shall be submitted for:
Switchgear and surge suppressors
All Lighting Fixtures
All Wiring Devices
END OF SECTION 16010

SECTION 16100 - BASIC MATERIALS AND METHODS

- 1. CONDUIT
1.01 All wire shall be run in accordance with the applicable codes (corrosion resistant rigid, threaded metal conduit or electrical metallic tubing (E.M.T.)), unless otherwise specifically stated.
A. Conduit below first floor slab, exposed to weather, or underground shall be rigid, threaded, galvanized, heavy wall type.
B. Carlon PVC, Type 40 heavy wall conduit with ground wire may be used underground below floor slab or pavement in lieu of rigid, threaded metal conduit.
C. A ground conductor shall be supplied over conduits and raceways.
D. PVC conduit run through areas subject to heavy vehicular traffic such as commercial parking areas, drive throughs, shall be concrete encased.
E. Conduits used between lighting standards shall be Carlon Type 40 min. and comply with NEMA TC-2, UL-651 (Standard).
1.02 Conduit and E.M.T. shall be delivered to the building in 10-foot lengths and each length shall have the Underwriter's Laboratories label.
1.03 Conduit and E.M.T. shall be run concealed in all finished areas of the building.
1.04 E.M.T. connectors and couplers shall be set screw type made of die cast as manufactured by Thomas & Betts, Steel City, or Appleton.
1.05 Conduit shall be securely fastened in place at no more than 8-foot centers, and hangers, supports or fastenings shall be provided at each conduit, elbow and at the end of each straight run, terminating at a box or cabinet.
1.06 Horizontal and vertical conduit runs shall be supported by one-hole malleable straps or other approved metal device with suitable bolts, expansion shield or beam clamp for mounting to building structure or special brackets.
1.07 Armored cable (BX) or nonmetallic sheathed cable (Romex) shall not be used.
1.08 No aluminum conduit shall be used.

- 1.09 Only short runs of flexible metal conduit not over 6' in length and having a ground conductor, shall be used for terminal connections to motors and also for electrical equipment where it is not practical to make final connection with rigid conduit.
1.10 Exposed conduit and conduit in ceiling space shall be run parallel to the building structure.
1.11 Conduit system shall conform to all the requirements of the National Electrical Code (N.E.C./N.F.P.A.-70) and local codes.
1.12 Metal Clad (MC) cable may be used where allowed by these drawings and conform to notes shown on sheet E0.0.
2. CONDUCTORS
2.01 Sizes of conductors for feeders are given on the drawings and no wire smaller than #12 gauge shall be used for branch lighting or power circuits.
2.02 All wire and cable for branch lighting or small power circuits shall have "NEC" Type "THHN/THWN" 600-volt insulation.
2.03 Wire and cable #10 gauge and above shall be stranded Type "THWN" insulated for 600-volts.
2.04 For special conditions, as provided by the National Electrical Code, Type "RHH, A.V.A." or other required insulation shall be used.
2.05 Where lighting fixtures are used as raceways, 90 degree C. minimum insulated wire shall be used.
3. GROUNDING
3.01 This Contractor shall provide, install and connect a complete system of grounding for all equipment and structures.
3.02 Electrical system and equipment grounds shall comply with the N.E.C. as well as all local and state codes and regulations.
3.03 Panels, conduit systems, motor frames, lighting fixtures and other equipment that are part of this installation shall be securely grounded both mechanically and electrically in accordance with all codes.
3.04 System ground shall not exceed a maximum of ten (10) OHMS resistance.
3.05 A ground conductor shall be supplied in ALL conduit.
4. TOGGLE SWITCHES AND RECEPTACLES
4.01 Color for all general purpose switches and receptacles shall be selected by architect/owner.
4.02 Acceptable device manufacturers are Hubbell, Leviton, or Pass & Seymour.
4.03 Wall Switches:
A. Single poles #1221, double pole #1222 and three (3) way switches #1223 shall be rated 20-ampere, 120/277 volts.
B. Switches shall be mounted 4"-0" above finished floor to ceilingline.
4.04 Duplex receptacles shall be 20-ampere at 120-volts, white porcelain #5362 or approved equivalent at 18" above floor to centerline or as noted on plans.
4.05 Outdoor receptacles shall be weatherproof with spring cover (Intertek #4926 plates).
5. WALL PLATES
5.01 Unless otherwise noted, all plates for wall switches, receptacles and telephone outlets shall be stainless steel.
5.02 All plates shall flush with contact with the wall and boxes. Edges shall be parallel to the finished walls and ceilings.
6. OUTLETS
6.01 Locations of outlets are shown approximately on the drawings.
6.02 Outlet boxes for concealed work shall be pressed steel boxes, galvanized and not less than #12 gauge, except floor boxes which shall be cast iron.
6.03 Outlets on the exterior of the building shall be flush weatherproof type.
6.04 All outlets shall be firmly secured in place.
6.05 All outlet locations in floor shall be verified with Owner's Representative before pouring of concrete floor.
7. BRANCH CIRCUIT WIRING
7.01 The Electrical Contractor shall provide and connect a complete system of panels, conduits, wire fittings, boxes, supports and all other miscellaneous materials required for equipment as indicated on the plans and ready for operation by the Owner.
7.02 All circuits shall be color coded.
END OF SECTION 16100

SECTION 16400 - ELECTRICAL SERVICE AND DISTRIBUTION

- 1. SECONDARY SERVICE
1.01 Electrical service shall be as shown on plans.
1.02 Electrical Contractor shall provide feeders from the existing service equipment to main panel in Shop as indicated on drawings.
1.03 Site electrical shall be coordinated with Owner by Electrical Contractor.
1.04 Provide coordination, via the General Contractor, for the final locations, penetrations, and service tie-ins associated with service conduits.
2. SAFETY SWITCHES
2.01 General
A. Switch shall be type as indicated on plans, with visible, quick make, quick break blades.
2.02 Enclosures
A. Steel enclosures with operating handle at side.
B. The enclosure shall be interlocked with the switch handle such that the enclosure door cannot be opened with switch in the "on" position.

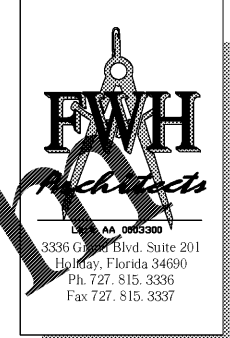
- 2.03 Ratings
A. Safety switches shall be rated for the continuous current and voltage indicated on the drawings.
2.04 Poles
A. Safety switches shall have the number of poles indicated on the drawings, but not fewer than one (1) pole for each ungrounded conductor to be opened.
2.05 Fuses
A. Where indicated, safety switches shall be fused in each ungrounded leg in accordance with the requirements of the Section entitled "Fuses".
2.06 Acceptable
A. Acceptable manufacturers are General Electric, Eaton, Square 'D', or Siemens.
3. DISTRIBUTION PANELBOARDS (INCLUDING TRANSFORMER PANELS)
3.01 Power and distribution panels shall be suitable voltage indicated on plans and/or riser diagrams.
3.02 Panels shall be provided with spare open full provisions for future breakers as shown.
3.03 Panels shall be manufactured as a complete unit by Siemens, Square 'D', General Electric Company, or Eaton, not an assembly of parts secured from a supply house.
3.04 Panelboards and switches shall be identified for "usage".
LIGHTING AND APPLIANCE PANELBOARDS
4.01 Lighting panels shall be dead front type, aluminum buss, with lugs only in the mains and branch circuits as indicated on the drawings.
4.02 Electrical Contractor shall arrange circuits as near as possible to circuit numbers on the drawings.
4.03 Panels shall be enclosed in galvanized steel of code thickness.
5. GENERAL (FOR ALL PANELS AND PANELBOARDS)
5.01 Metal framed card holders with typewritten circuit directory must be provided for each panel.
5.02 All panels, safety switches, starters and in general, all equipment requiring lugs shall be equipped with solderless type U.L. approved lugs.
5.03 Provide all necessary unistrut, channel, backing and supports to mount switchboard and panelboards securely in place.
6. FUSES
6.01 This Contractor shall replace all fuses blown during construction and testing and shall provide a complete set of fuses in all fuse holders, switches, panels and all other devices requiring fuses.
6.02 Fuses shall be as specified herein and indicated on drawings.
END OF SECTION 16400

SECTION 16500 - LIGHTING

- 1. LIGHTING FIXTURES
1.01 All fixtures shall be as shown on Fixture Schedules, and approved by owner.
1.02 Unless otherwise indicated, all lighting fixtures shall be furnished and installed by Electrical Contractor as indicated on the Lighting Fixture Schedules, including lamps.
1.03 All fixtures shall bear the Underwriter's Laboratories label and shall be installed according to manufacturer's instruction.
1.04 All fixtures, unless otherwise indicated, shall be new and undamaged.
1.05 Surface-mounted fluorescent fixtures shall be mounted 1-1/2" from ceiling.
1.06 This Contractor shall provide and install all necessary support media for all lighting fixtures including structural steel, angles, rods, etc.
1.07 This Contractor shall support all fixtures from building structural members and NOT from ceiling system.
END OF SECTION 16500

Original Plans

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TO THE BEST OF THE KNOWLEDGE OF THE ARCHITECTS AND ENGINEERS, PLANS AND SPECIFICATIONS COMPLY WITH THE APPLICABLE MINIMUM BUILDING CODES AND THE APPLICABLE MINIMUM FIRE SAFETY STANDARDS

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Table with 4 columns: no., date, revision, descriptions

STARBUCKS SHELL CONSTRUCTION 2500 MONUMENT ROAD JACKSONVILLE, FL

12.13.17 date 17.047 comm. no.

ELECTRICAL SPECIFICATIONS

E4.0

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