

Order Plans @

SPECIFICATIONS DIVISION 16000

I. GENERAL

- All materials shall be made in the USA, new, of the best grade, and bear a U.L. label. All workmanship shall be of the highest standards.
- All work to be performed in accordance with the International Building Code, prevailing local codes, and the National Electrical Code, 2014 ed. Contractor shall secure and pay for all permits.
- Shop drawings shall be submitted for approval for the following items:
 - Lighting fixtures.
 - Apparatus including panelboards, safety switches, and fuses.
 - Wiring devices.
 - Sprinkler Monitoring and Fire Pump Monitoring systems.
 - Other items requested by the architect.
- Submittals/shop drawings shall bear a stamp by the electrical subcontractor and the general contractor indicating they have been reviewed and that the equipment proposed is compatible without exception with the contract documents. Submittals/shop drawings without such stamp shall be returned without review by the Engineer.
- Automatic control wiring is not included except as shown on the drawings.
- All materials and installation to be guaranteed against defects for a period of one year from date of completion and final acceptance.
- Contractor shall repair all remodel penetrations made by his forces to original condition, paying particular attention to preservation of original fire ratings. Contractor shall submit UL Fire Resistance Directory details for all penetrations through fire rated assemblies.
- Contractor shall maintain an up to date set of drawings on site at all times reflecting as constructed changes. Drawings shall be turned over to the architect at the time of final acceptance.
- Contractor shall prepare 3 bound copies of all approved submittals, maintenance instructions, and other data the architect may request and submit to the architect at the time of final acceptance.
- Contractor shall provide engraved phenolic labels for all major pieces of electrical equipment.
- In all cases the word "provide" shall mean to both furnish and install.

II. RACEWAYS

- In or under concrete slabs - Schedule 40 PVC (3/4" minimum).
- Direct burial in earth - Schedule 40 PVC (3/4" minimum). Provide 24" minimum cover for runs below finished grade outside of buildings unless otherwise noted.
- Conduits entering building from underground shall be sealed.
- Concealed in walls or above ceilings - E.M.T.
- Exposed:
 - Portions of service entrance - Rigid steel.
 - Other areas - E.M.T.
- For interior connections to motors, transformers, and vibrating equipment - Flexible metal conduit.
- For connections to motors, etc. exposed to weather - sealtight.
- Fittings:
 - For E.M.T. - Die-cast, set-screw (compression type where exposed to weather).
 - For sealtight - Steel insulated throat type.
- Conduit shall be run concealed wherever possible. All conduit (exposed and concealed) shall be run parallel or perpendicular to major building elements.
- All conduits are to be cleaned and have pull string installed.
- Provide pull and junction boxes where required by code whether or not they are shown on the drawings. All boxes shall be legibly marked to indicate the circuits contained therein.
- Type MC cable with full size ground wire may be employed where concealed and allowed by NEC. In no case shall type MC cable be employed in exposed applications.

III. WIRE AND CABLE

- All wire to be copper unless specifically noted otherwise on the drawings. Minimum size to be #12 A.W.G. All conductors to be installed in conduit.
- Insulation:
 - Service entrance - Type XHHW.
 - #12 and larger - Type THHN/THWN.
- Splices in feeders will not be permitted.
- Color coding as follows shall be employed:
Voltage Phase A Phase B Phase C Neutral
120/208 Black Red Blue White
- Contractor shall provide a green grounding conductor in all raceways (except service lateral) whether indicated on the

drawings or not. In general these conductors have been shown in feeders and underground conduits on the drawings.

IV. WIRING DEVICES

- Duplex Receptacles - 20 Amp, 120 volt, Hubbell CR20WH1.
- Switches, single pole - 20 amp, 120/277 volt, Hubbell CS120W.
- Switches, 2 pole - 20 Amp, 277 Volt Hubbell CSB220W.
- Switches, momentary, center off - 20 Amp, 277 Volt Hubbell HBL1557W.
- Occupancy Sensor Switches, single pole - 120/277 Volt Sensor Switch WSX PDI VA WH (verify color with architect prior to purchase).
- All devices shall be white. Plates shall be smooth, opaque white nylon. Exposed receptacles shall be in 4" square boxes with industrial covers.
- When multiple boxes are indicated for one work station (e.g. power, telephone, and data) the boxes shall be arranged for a maximum 8" spacing between boxes. The contractor shall be required to provide horizontal members between studs as required to see that this is accomplished. In rooms where above counter receptacles are indicated, switch elevations shall be adjusted to match receptacle elevations for uniformity.
- All outlet boxes shall be minimum 4" square with device rings appropriate for the wall construction and openings as required to accommodate the indicated devices.
- Devices installed outdoors to be weather resistant type.

V. EQUIPMENT WIRING

- Provide final connection to all equipment shown on the drawings.
- Provide local disconnecting means for all equipment except where specifically noted on the drawings to be by others.
- Verify all equipment ratings prior to connection and notify architect of any discrepancy prior to proceeding with connection of same.
- Contractor shall be responsible for coordination of all materials interfaced, i.e. lug size versus conductors or other similar items.

VI. DISTRIBUTION EQUIPMENT

- Panelboards:
 - 120/208 Volt circuit breaker panelboards - Square D NQ00 or equivalent. Refer to fault current study (BUS AFC) on drawings for minimum AIC rating.
 - Provide each panelboard with an engraved phenolic nameplate and typewritten directory card in plastic pocket. Directory cards shall be worded to indicate the rooms being served.
 - Provide a ground bus in all panelboards.
 - Where breakers are serving HVAC equipment with a requirement for HACR breakers, in the range of 15-60 Amps, UL approved HACR breakers shall be used.
 - Contractor shall include Arc-Flash Study and Hazard Warning Label for meter socket and each panelboard in accordance with the requirements of NEC 110.16.
- Disconnect and safety switches:
 - All switches shall be general duty.
 - Switches exposed to weather shall be NEMA 3R.
 - Provide rejection clips for all fusible units.
 - All fuses shall be Class RK1, RK5 or Class L with applications as follows:
 - Service entrance: Class RK1.
 - Transformer and motor loads: Class RK5.
 - Ratings above 601 amps: Class L.

VII. LIGHTING FIXTURES

- Provide lamps as indicated on the schedule and manufactured by Sylvania, Philips, or GE.
- Ballasts for fluorescent fixtures shall be electronic type, and fused where required by local code.
- High bay fixtures shall be furnished with factory hooks. Mounting shall be via 3/8" machine eye bolts installed with double nuts and washers through holes drilled in structural components. Ballasts shall be fused where required by local code.
- All fixtures shall be securely fastened to structural elements from two (2) points.

VIII. LIGHTING CONTACTORS

- All contactors to be electrically or mechanically held as indicated on the drawings. Square D class 8903, 30 amp contact minimum.
- Provide lockable, hinged NEMA 3R enclosure sized to house all control devices shown on drawings.

IX. TELEPHONE AND DATA SYSTEMS

- In insulated walls, outlets shall consist of a 4" square box with single gang device ring and 3/4" conduit extended to the ceiling space and terminated in a bushing. In non-insulated walls, and non-insulated walls the use of a single

gang device ring with pull string extended through the top plate of the partition shall be acceptable.

- Route conduits to minimize number of ells.
- Install long-sweep, 90 degree rigid galvanized steel ells on all PVC telephone service conduits.
- Plywood backboard shall be painted with (2) coats of fire retardant paint.
- Provide a 1" minimum conduit from the main telephone service location to the telephone board in the space.

X. SPRINKLER MONITOR AND FIRE PUMP MONITOR PANELS

- The contractor is to provide a complete and operating system in accordance with all applicable codes, regulations, and the requirements of all appropriate authorities. The system shall be addressed per plans, electrically supervised, connected, tested and left in first class operating condition. All equipment herein specified shall comply with applicable standards of Underwriters Laboratories and the National Fire Protection Association.
- Actuation of an initiating device shall initiate its respective address display at the FACP and annunciator panel. The visual alarm indicator shall remain illuminated until the system has been restored to the normal operating mode. Activation of the system shall silence any and all public addressing systems.
- The main control panel shall be supplied with an alarm silence/acknowledge switch which will silence the audible alarms. Should a subsequent alarm actuation of a different address occur, the alarm devices will sound until silenced or the main control panel is reset.
- Each initiating circuit shall be supervised. Any disarrangement of system wiring such as loss of power, opens, or grounds shall initiate the audible and visual trouble indicators. The trouble lamp illumination shall be nonoperating except by an actual clearing of the trouble condition. The audible trouble signal may be silenced by use of a trouble silence switch which incorporates the ring-back feature.
- Power for operating smoke detectors will be obtained from a supervised power supply within the main fire alarm control panel.
- The control unit shall derive its primary operating power from a 120 VAC single phase 60 Hz supply. The FACP shall be equipped with battery charger and nicad batteries.
- The system shall be provided with sufficient battery capacity to operate the entire system upon loss of normal 120 VAC power in a normal supervisory mode of a period of twenty-four (24) hours with five (5) minutes, but not less than that required by the local authority, of alarm indication at the end of this period. The system shall automatically transfer to the standby batteries upon power failure. All battery charging and recharging operations shall be automatic. Batteries, once discharged, shall recharge at a rate to provide a minimum of 70% capacity in 12 hours.
- System and components shall be as manufactured by Silent Knight or Fire Lite only. Products are as follows:
 - FACP - Fire Lite, MS-9050UD(E) with built in digital alarm communicator transmitter (Power limited, addressable-analog system).
 - Horn/Strobe units - Wall mounted, 75 candela minimum.
 - Pull Stations - Semi flush, double action.
 - Smoke Detectors - Photoelectric type ceiling mounted.
 - Smoke Detectors - Photoelectric type, duct mounted with enclosure with sampling tube supply, for remote test station. Contractor is to connect control points of RTU via relay to shut down fans. Detectors are to be furnished by the electrical subcontractor and installed by the mechanical contractor the wired by the electrical contractor.
 - Water Flow and Leaker switches - Provide addressable monitoring module.
- Wiring:
 - For other initiating circuits - #16 AWG wire to comply with NEC 760.
 - For bell wire - #16 AWG VDC power, door holder wiring - #14 AWG wire to comply with NEC 780.
 - All wire to be installed in conduit. All conduit to be electrical metallic tubing (EMT).
 - Consistent color coding shall be maintained throughout the system.
 - All wiring is power limited Class B.
- Labeling:
 - Contractor shall provide a framed typewritten address schedule which clearly indicates devices connected to each alarm address and signal circuit and hang adjacent to the FACP.
 - Junction boxes shall be spray painted red.
- Supervision and Testing:
 - The installation shall be supervised by an authorized manufacturer's representative as a Remote Supervisory Station Fire Alarm System.
 - Upon completion, the system shall be tested in accordance with NFPA 72 in the presence of the owner and tenant's representative, the Fire Marshal, and an authorized manufacturer's representative.
 - Manufacturer's and contractor's certification of completed, operable, and successfully tested system shall be furnished to the owner.

ELECTRICAL LEGEND

SYMBOL	DESCRIPTION
○	LIGHT FIXTURE, CEILING TYPE (1)
○-○	LIGHT FIXTURE, WALL BRACKET TYPE (1)
□	FLUORESCENT LIGHT FIXTURE (1)
□	FLUORESCENT LIGHT FIXTURE ON EMERGENCY POWER OR WITH BATTERY PACK (1)
—	FLUORESCENT STRIP (1)
□	FLUORESCENT STARWELL LIGHT FIXTURE ON EMERGENCY POWER OR WITH BATTERY PACK (1)
☞	FLOODLIGHT, (ARROW SHOWS AIMING) (1)
☞	EXIT LIGHT, (ARROW(S) AS INDICATED) (1)
○-□	POLE WITH ARM MOUNTED FIXTURE (1)
☞	EMERGENCY LIGHT (BATTERY PACK) (1)
☞	COMBINATION TWIN HEAD EMERGENCY EXIT LIGHT (1)
§	SINGLE POLE SWITCH 46" AFF OR AS NOTED (2)
§	TWO POLE SWITCH 46" AFF OR AS NOTED (2)
§	THREE-WAY SWITCH 46" AFF OR AS NOTED (2)
§	FOUR-WAY SWITCH 46" AFF OR AS NOTED (2)
§	DIMMER SWITCH (1000W MINIMUM LOAD) 46" AFF OR AS NOTED (2)
§	OCCUPANCY SENSOR SWITCH 46" AFF OR AS NOTED (2)
§	FAN CONTROLLER 46" AFF OR AS NOTED (2)
§	DUPLEX RECEPTACLE 18" AFF OR AS NOTED (2) (3)
§	DUPLEX RECEPTACLE (MOUNTED ABOVE COUNTER) 46" AFF OR AS NOTED (2) (3)
§	DUPLEX RECEPTACLE (ONE HALF SWITCHED) 46" AFF OR AS NOTED (2)
§	SINGLE RECEPTACLE 125V, 20A, 15 AMP OR AS NOTED (2)
§	2 DUPLEX RECEPTACLES IN 2 GANG BOX WITH COMMON COVER PLATE, 18" AFF OR AS NOTED (2)
§	2 DUPLEX RECEPTACLES IN 2 GANG BOX WITH COMMON COVER PLATE, 46" AFF OR AS NOTED (2)
§	POWER POLE POKE-THRU FLOOR (2) (3)
§	OCCUPANCY SENSOR SWITCH LOCATED IN CEILING (2)
§	RECEPTACLE HIGH FLOOR MOUNTED (2) (3)
§	SPECIAL RECEPTACLE AS NOTED, 18" AFF OR AS NOTED
§	WIREMOLD, SIZE, LENGTH AND NUMBER OF OUTLETS PER FOOT NOTED, MOUNT AS NOTED
§	TELE-POWER POLE
§	TELEPHONE OUTLET 18" AFF OR AS NOTED
§	COMMUNICATIONS/DATA OUTLET 18" AFF OR AS NOTED
§	COMBINATION TELEPHONE/DATA OUTLET 18" AFF OR AS NOTED
§	TELEPHONE OUTLET FLUSH IN FLOOR
§	CABLE TV OUTLET 18" AFF OR AS NOTED
§	DRY TYPE TRANSFORMER
§	DISCONNECT SWITCH, AMPERAGE/POLE/FUSE/VOLTAGE/NEMA TYPE (NEMA 1 UN) (600V UN) AS INDICATED
§	SINGLE PHASE MANUAL MOTOR STARTER
§	MOTOR STARTER, SIZE AND TYPE AS NOTED
§	COMBINATION MOTOR STARTER AND DISCONNECT SWITCH, SIZE AND TYPE AS NOTED
§	MOTOR CONNECTION OR EXHAUST FAN
§	OUTLET, JUNCTION OR PULL BOX
§	DRIVEN GROUND UN
§	JUNCTION BOX WITH FLEXIBLE CONNECTION TO LIGHT FIXTURE ABOVE CEILING
§	CONDUIT CONCEALED IN CEILING SPACE OR WALL (3)
§	CONDUIT IN SLAB OR UNDERGROUND (3)
§	CONDUIT EXPOSED ON WALL OR CEILING (3)
§	PHASE, NEUTRAL, EQUIPMENT GROUND, ISOLATED GROUND CONDUCTORS (3)
§	PANELBOARD 480Y/277V, TOP 84" AFF
§	PANELBOARD 208Y/120V OR 240V/120V, TOP 84" AFF
§	MOLDED CASE CIRCUIT BREAKER
§	INSULATED CASE DRAW OUT CIRCUIT BREAKER
§	CONDUIT RUN UP
§	CONDUIT RUN DOWN
§	CONDUIT STUD
○	REFER TO LIKE NUMBERED NOTES

ELECTRICAL LEGEND

SYMBOL	DESCRIPTION
[FACP]	FIRE ALARM CONTROL PANEL, TOP 86" AFF
[RAMP]	FIRE ALARM REMOTE ANNUNCIATION PANEL, TOP 86" AFF
□	FIRE ALARM SYSTEM PULL STATION 46" AFF
☞	FIRE ALARM SYSTEM HEAT DETECTOR CEILING MOUNTING (W FOR WALL MOUNTING)
☞	FIRE ALARM SYSTEM SMOKE DETECTOR SEMI FLUSH IN WALL 80" AFF TO BOTTOM (W FOR WALL MOUNTING)
☞	FIRE ALARM SYSTEM DUCT TYPE SMOKE DETECTOR IN SUPPLY DUCT (R IN RETURN DUCT)
☞	FIRE ALARM SYSTEM SMOKE DETECTOR SEMI FLUSH IN CEILING (W FOR WALL MOUNTING)
☞	FIRE ALARM SYSTEM SMOKE DETECTOR SEMI FLUSH IN WALL 80" AFF TO BOTTOM
☞	FIRE ALARM SYSTEM HORN/STROBE SEMI FLUSH IN WALL 80" AFF TO BOTTOM
☞	FIRE ALARM SYSTEM BELL
■	MAGNETIC DOOR HOLDER WITH FLUSH BOX ON WALL
□	TAMPER SWITCH
□	FLOW SWITCH
□	FAN SHUTDOWN RELAY

ABBREVIATIONS

AF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AMU	AIR HANDLING UNIT
ATS	AUTOMATIC TRANSFER SWITCH
BFG	BELOW FINISHED GRADE
□	OUTLET
□	CEILING MOUNTED
□	CONDENSING UNIT
□	EXISTING
EC	ELECTRICAL CONTRACTOR
EG	EQUIPMENT GROUND
EWC	ELECTRIC WATER COOLER
EWH	ELECTRIC WATER HEATER
GEC	GROUNDING ELECTRODE CONDUCTOR
GFI	GROUND FAULT INTERRUPTER
HD	HIGH INTENSITY DISCHARGE
HP	HORSEPOWER
IG	ISOLATED GROUND
JB	JUNCTION BOX
LSG	LONG, SHORT, INSTANTANEOUS, GROUND FAULT SETTINGS
(N)	NEW
NEUT	NEUTRAL
NF	NON-FUSED
NL	NIGHT LIGHT
NP	NAMEPLATE
PNL	PANEL
(R)	RELOCATED
RTU#	ROOF TOP UNIT
SER	SERVICE ENTRANCE RATED
SPEC	SPECIFICATIONS
TFL	THROUGH FEED LUGS
TL	TWISTLOCK
UN	UNLESS OTHERWISE NOTED
WP	WEATHERPROOF

LEGEND NOTES

- LETTER INSIDE OR ADJACENT TO FIXTURE SYMBOL INDICATES TYPE. SEE FIXTURE SCHEDULE FOR MANUFACTURER, MOUNTING, QUANTITY AND TYPE OF LAMPS.
- SEE SPECIFICATIONS FOR VOLTAGE AND AMPERE RATING.
- CIRCUIT AND NEUTRAL SHARING DESIGNATIONS ARE SHOWN ON HOMERUNS AND ARE TO BE CONSISTENT THROUGHOUT CIRCUITS. WHERE MULTIPLE NEUTRALS ARE INSTALLED, INTERCHANGE OF NEUTRALS IS PROHIBITED. ALL RACEWAYS CONTAIN AT MINIMUM (2) #12 CURRENT CARRYING CONDUCTORS PLUS (1) #12 EQUIPMENT GROUND IN 1/2" UN (3/4" UN WHERE INSTALLED BELOW GRADE).

LEGEND GENERAL NOTES

- ALL MOUNTING HEIGHTS ARE TO CENTERLINE UN
- ALL SYMBOLS MAY NOT BE USED

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PROJECT NAME
Publix/Retail @ Lake Crossing
South Lake Drive & Palm Springs Road
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SHEET TITLE
ELECTRICAL LEGEND

NO.	DESCRIPTION	DATE
A	100% Final Submission	03/07/17
B	100% Public	05/17/17
A	ISSUED FOR BIDDING/INSTALL	06/01/17

PROJECT NO.	DATE	BY	CHECKED
210102	03-17-17	MM	CS

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