

ELECTRICAL SPECIFICATIONS (CONT'D):

ELECTRICAL POWER - SERVICE AND DISTRIBUTION

ELECTRICAL SERVICE:

- SEE DRAWINGS FOR TYPE, SIZE, VOLTAGE, PHASE, AND OTHER REQUIREMENTS.
- PROVIDE OR ARRANGE WITH THE SERVING UTILITY FOR INSTALLATIONS TO PROVIDE AN RECORDING VOLTMETER AT THE SERVICE POINT ON THE FIRST DAY OF FACILITY OPEN FOR BUSINESS FOR A 24 HOUR VOLTAGE TEST. VOLTAGE AND REGULATION ARE NOT WITHIN ACCEPTABLE LIMITS. ARRANGE WITH THE UTILITY FOR PROPER VOLTAGE. SUBMIT TO THE OWNER A REPORT OF MAXIMUM AND MINIMUM VOLTAGE AND A COPY OF THE RECORDING VOLTMETER CHART.

CONNECTION TO SERVING UTILITIES:

- PROVIDE RACEWAYS, TERMINATIONS, METERING PROVISIONS, AND MISCELLANEOUS EQUIPMENT AS REQUIRED FOR ELECTRICAL AND TELEPHONE SERVICES FOR CONNECTION BY THE SERVING UTILITY. IN STRICT COMPLIANCE WITH THE REQUIREMENTS OF ALL APPLICABLE CODES AND OF THE SERVING UTILITY. VERIFY ALL SERVICE TERMINATION AND CONNECTION POINTS IN THE FIELD AND WORK IN CONJUNCTION WITH THE UTILITY INVOLVED IN THE INSTALLATION OF A SERVICE. PROVIDE ALL NECESSARY EQUIPMENT REQUIRED FOR COMPLETE UTILITY CONNECTION BUT NOT FURNISHED BY THE SERVING UTILITY. NOTIFY THE UTILITY COMPANIES INVOLVED WITHIN TWO WEEKS AFTER NOTICE TO PROCEED, OF ALL REQUIRED INFORMATION NECESSARY FOR THE UTILITY TO SUPPLY THE PROJECT WITH OUT DELAY. PAY ALL CHARGES FOR THE SERVING UTILITY FOR THE ELECTRICAL SERVICES.

GROUNDING:

- PERMANENTLY AND EFFECTIVELY GROUND AND BOND THE ELECTRICAL INSTALLATION IN A THOROUGH AND EFFICIENT MANNER AND IN CONFORMANCE WITH A MINIMUM WITH NFPA 70, OR THESE DOCUMENTS, WHERE THEY EXCEED CODE REQUIREMENTS. USE BARE OR INSULATED CONDUCTORS, AS SPECIFIED HEREIN, AND OTHER MATERIALS INDICATED ON THE DRAWINGS.

ELECTRICAL DISTRIBUTION - CIRCUIT BREAKERS IN EXISTING PANELBOARDS:

- PROVIDE NEW CIRCUIT BREAKERS FOR INSTALLATION IN EXISTING PANELBOARDS OF THE SAME MANUFACTURE AND TYPE AND MAKE CIRCUIT CURRENT INTERRUPTING RATINGS AS THE EXISTING PANELBOARD CIRCUIT BREAKERS.

ELECTRICAL DISTRIBUTION - DISCONNECT (SAFETY) SWITCHES:

- DISCONNECT (SAFETY) SWITCHES, SQUARE D, SIEMENS, CUTLER HAMMER, OR GENERAL ELECTRIC, OR NON-FUSED (AS INDICATED ON DRAWINGS OR OTHERWISE) NEMA 3SI, HEAVY DUTY, EXTERNALLY OPERATED, VISIBLE-BLADE SAFETY SWITCHES, NEMA ENCLOSURE TYPE INDICATED ON THE DRAWING OR SUITABLE FOR THE ENVIRONMENT IN WHICH INSTALLED, BASED ON FUSEIBLE SWITCH AND FUSE SIZES INDICATED, INCLUDE CLASS R, J OR L FUSE PROVISIONS AS APPLICABLE.
- WHERE INDICATED, PROVIDE FUSEIBLE SWITCHES PERMANENTLY LABELED AS SUITABLE FOR USE AS SERVICE ENTRANCE AND FINISH TERMINATION AND SEPARATE NEUTRAL AND GROUND ASSEMBLIES, SUITABLE FOR THE SIZES OF CONDUCTORS INDICATED. DO NOT DOUBLE-LUG ANY TERMINATIONS NOT SPECIFICALLY LISTED AS SUITABLE FOR MORE THAN ONE CONDUCTOR.
- PROVIDE SWITCHES WHERE NOT FURNISHED WITH THE STARTING EQUIPMENT, AT ALL OTHER POINTS REQUIRED BY NFPA 70, AND WHERE INDICATED ON THE DRAWINGS.

ELECTRICAL DISTRIBUTION - FUSES:

- PROVIDE EACH CIRCUIT AND SET OF FUSE CLIPS THROUGHOUT THE WORK WITH BUSMANN, FERRAZ SHAMUIT, OR LITTLEFUSE FUSES, SIZES AND TYPES AS REQUIRED OR INDICATED. ALL FUSES LARGER THAN 1/8 INCH OR SMALLER TO TYPE KRP-C BUSMANN LOW PEAK OR EQUAL, FUSES USED TO PROTECT MOTOR-LOAD CLASS RK5, BUSMANN FUSETRON OR EQUAL, FUSES USED TO PROTECT ALL OTHER ELECTRICAL EQUIPMENT, UL CLASS RFI, DUAL ELEMENT, BUSMANN LPS-1RN OR EQUAL. ALL FUSED DEVICES SHALL BE LABELED AS TO TYPE AND SIZE OF FUSE REQUIRED.

- FURNISH THREE SPARE FUSES OF EACH SIZE AND TYPE USED ON THE PROJECT EXCEPT FOR MAIN SWITCH (FURNISH ON SPARE), NEATLY CONTAINED IN A PROPERLY LABELED CABINET.

LIGHTING

LIGHT FIXTURE LOCATIONS:

- LIGHT FIXTURES SHOWN ON THE ELECTRICAL DRAWINGS REPRESENT GENERAL ARRANGEMENTS ONLY. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATIONS. COORDINATE LOCATION WITH ALL OTHER TRADES BEFORE INSTALLATION TO AVOID CONFLICTS. COORDINATE LIGHT FIXTURE LOCATIONS IN MECHANICAL ROOMS WITH FINAL INSTALLED PIPING AND DUCTWORK LAYOUTS.

LIGHT FIXTURES:

- PROVIDE LIGHT FIXTURES AS SCHEDULED ON DRAWINGS, INCLUDING ALL LAMPS, ALL NECESSARY MATERIAL AND LABOR TO COMPLETELY HANG, CLEAN, AND MAKE LIGHT FIXTURES COMPLETELY READY FOR USE. LIGHT FIXTURE MODELS, NUMBERS, SCHEDULED ON THE DRAWINGS, SHOW ON THE MANUFACTURER, GRADE AND STYLE OF LIGHT FIXTURES REQUIRED. PROVIDE ALL HANGERS, SUPPORTS, AND MISCELLANEOUS HARDWARE REQUIRED TO INSTALL LIGHT FIXTURES, PROPER TRIM TO FIT EACH CEILING CONDITION ACTUALLY EXISTING. PROVIDE ADDITIONAL TIE WIRES CONNECTED TO STRUCTURE TO CONFORM TO SEISMIC REQUIREMENTS WHERE REQUIRED BY THE APPLICABLE BUILDING CODES.

- PACKAGING OF LIGHT FIXTURES WILL NOT BE ALLOWED. ONLY THOSE LUMINAIRES LISTED IN THE LIGHT FIXTURE SCHEDULE, OR APPROVED IN ACCORDANCE WITH SUBSTITUTIONS OF THESE SPECIFICATIONS, WILL BE ACCEPTED. WHERE THE LIGHT FIXTURE SCHEDULE INDICATES AN ALLOWANCE FOR A SPECIFIC LIGHT FIXTURE, THE PRICE IS A CONTRACTOR PRICE. INCLUDE ALL ADDITIONAL COSTS FOR THE FREIGHT, LAMPS, AND INSTALLATION OF LIGHT FIXTURE AND LAMPS.

- SURFACE-MOUNT ALL LED LIGHT FIXTURES LOCATED IN AREAS WITHOUT SUSPENDED CEILING UNLESS OTHERWISE INDICATED ON THE DRAWINGS. PROVIDE RIGID METAL SPACERS FINISHED IN WHITE ENAMEL BETWEEN THE TOP OF EACH LIGHT FIXTURE AND THE CEILING ABOVE TO MAINTAIN 1/2-INCH SPACE. SPACERS SHALL BE APPROVED BEFORE INSTALLATION.

- INSTALL LED LIGHT FIXTURES HANG IN CONTINUOUS ROWS ON CHANNEL STRUTS SPECIFICALLY DESIGNED FOR THIS PURPOSE.

- INSTALL ALL LED LIGHT FIXTURES LOCATED IN AREAS WITHOUT CEILING IMMEDIATELY BELOW THE ROOF-FRAMING MEMBERS, OR SUSPENDED FROM CHAIN HANGERS SUITABLE IN LENGTH TO PROVIDE THE INDICATED MOUNTING HEIGHT. HANGERS, "HYDEE" HANGER TYPE FOR OUTLET TYPE FOR OUTLET BOX MOUNTING, COMPLETE WITH GROUNDING RECEPTACLE, PLUG, 3-WIRE CORD AND NECESSARY CHAIN.

- THROUGH WIRING OF RECESSED LIGHT FIXTURES, IN SUSPENDED CEILING, IS NOT PERMITTED. CONNECT EACH LIGHT FIXTURE BY A WHIP TO A JUNCTION BOX. PROVIDE CABLE WHIPS OF SUFFICIENT LENGTHS TO ALLOW FOR RELOCATING EACH LIGHT FIXTURE WITHIN A 5-FOOT RADIUS OF ITS INSTALLED LOCATION, BUT NOT EXCEEDING 6 FEET IN UNSUPPORTED LENGTHS.

EMERGENCY LIGHTING UNITS AND EXIT SIGNS:

- DESCRIPTION: SELF-CONTAINED UNITS COMPLYING WITH UL 924.
- BATTERY: SEALED, MAINTENANCE-FREE, LEAD-ACID TYPE. THE BATTERIES SHALL BE OF SUITABLE RATING AND CAPACITY TO SUPPLY AND MAINTAIN AT NOT LESS THAN 8 1/2 PERCENT OF THE NOMINAL BATTERY VOLTAGE FOR THE TOTAL LAMP LOAD ASSOCIATED WITH THE UNIT FOR A PERIOD OF AT LEAST 1 1/2 HOURS, OR THE UNIT EQUIPMENT SHALL SUPPLY AND MAINTAIN NOT LESS THAN 60 PERCENT OF THE INITIAL EMERGENCY ILLUMINATION FOR A PERIOD OF AT LEAST 1 1/2 HOURS.

- CHARGER: FULLY AUTOMATIC, SOLID-STATE TYPE WITH SEALED TRANSFER RELAY.

- OPERATION: RELAY AUTOMATICALLY TURNS LAMP ON WHEN POWER SUPPLY CIRCUIT VOLTAGE DROPS TO 80 PERCENT OF NOMINAL VOLTAGE OR BELOW. LAMP AUTOMATICALLY DISCONNECTS FROM BATTERY WHEN VOLTAGE APPROXIMATELY RECHARGE LEVEL. WHEN NORMAL VOLTAGE IS RESTORED, RELAY AUTOMATICALLY DISCONNECTS LAMP FROM BATTERY, AND BATTERY IS AUTOMATICALLY RECHARGED AND FLOATED ON CHARGER.

SAFETY HAZARD - SQUARE D SAFETY SWITCH RECALL

Square D Brand General Duty Safety Switch can potentially remain energized when the handle is in the "OFF" position:

Schneider Electric has recalled the Square D brand switches due to electrical shock hazard because the power can stay on when the safety switch handle is in the "OFF" position.

Name of Product: Square D brand General Duty 30 & 60A, 120/240-volt, 2-phase and 3-phase NEMA 3R Safety Switches
Remedy: Replace
Recall date: April 17, 2018

Description: This recall involves Square D brand General Duty 30 & 60A, 120/240-volt, 2-phase and 3-phase NEMA 3R safety switches. The switches are a dark gray metal box with a black handle on the side that can be moved to an "ON" or "OFF" position. The "OFF" position is designed to shut off the flow of electricity. The switches may be used in or around commercial buildings, outbuildings, apartments and homes. They measure about 10 inches by 7 inches by 4 inches. Brand name "Square D", the ampere of the safety switch and the 120/240-volt or 240-volt marking is printed on a label on the front of the safety switch. The recalled switches were manufactured between January 1, 2014 through January 18, 2018 and have date codes 1401 through 1803. The date codes are in the YYYY format (example: 1401 = year 2014, week 1). The date code of the product can only be found on the inside of the cover and is not accessible if the product is

Impacted Catalog Numbers:

DU222RB	DU322RBUP	D221NRBUP	DJ221RBUP
DU222RBUP	D211NRB	D321NRB	CD321NRB
DU321RB	D211NRBCP	D321NRBCP	DJ321RBBCP
DU321RBUP	D221NRB	D321NRBUP	DJ322RBBCP
DU322RB	D221NRBCP	DJ221RB	

ELECTRICAL SYMBOLS LIST

NOTE: ALL MOUNTING HEIGHTS ARE TO CENTER LINE OF THE OUTLET BOX UNLESS OTHERWISE INDICATED.

SYMBOL	DESCRIPTION
	EXIT LIGHT - CEILING, WALL, WITH LIGHTS
	EMERGENCY BATTERY LIGHT - INTERIOR, EXTERIOR
	FIXTURE - 2'x4' LED TROFFER - CEILING "A" = FIXTURE TYPE, "Q" = SWITCH, "M" = CIRCUIT
	FIXTURE - 2'x2' LED TROFFER - CEILING
	FIXTURE - 3' SQUARE RECESSED LED
	FIXTURE - 2'x4', 2'x2' - NIGHT-LIGHT OPERATION
	FIXTURE - EMERGENCY LIGHT 1/4 90 MIN BATTERY
	FIXTURE - 16" LED PENDANT/ 12" LED PENDANT
	FIXTURE - TRACK WITH TRACK HEADS - SPOT
	FIXTURE - LED LINEAR
	SWITCH-SINGLE POLE, THREE WAY, SUBSCRIPT DENOTES OUTLET CONTROLLED, DIMMER, OCCUPANCY SENSOR - MH. 44" AFT
	OCCUPANCY SENSOR - AS SPECIFIED - CEILING MOUNTED
	PHOTOCELL (INTERIOR) FOR DAYLIGHT HARVESTING
	LIGHTING CONTACTOR - TIME CLOCK
	RECEPTACLE - 20A - 125 VOLTS DUPLEX, DOUBLE DUPLEX - RECEPTACLE ONLY RECEPTACLE - 20A - 125 VOLTS DUPLEX, DOUBLE DUPLEX - MH. 44" AFT
	RECESSED FLOOR BOX - DUPLEX RECEPTACLE
	STUB UP - CONDUIT SIZE PER PLAN
	RECEPTACLE - SPECIAL - NEMA CONFIGURATION AS NOTED
	RECESSED FLOOR BOX - TELEPHONE/DATA OUTLET
	COMMUNICATIONS OUTLET - COMBINATION TELEPHONE/DATA PROVIDE 1/2 INCH FULLSTRINGS TO CEILING SPACE
	PANELBOARD 277/480 VOLTS - MH. 6'-6" TO TOP
	PANELBOARD 120/208 VOLTS - MH. 6'-6" TO TOP
	SPECIAL SYSTEMS CONTROL PANEL AS NOTED
	SAFETY DISCONNECT SWITCH
	FUSED DISCONNECT SWITCH
	DRY TYPE TRANSFORMER
	SWITCH - MOTOR RATED
	SWITCH - KEY
	JUNCTION BOX - IN FLOOR, CEILING
	MOTOR - SINGLE PHASE, MOTOR SPEEDS AS NOTED
	MOTOR - THREE PHASE, MOTOR SPEEDS AS NOTED
	CONTROL STARTER/DISCONNECT SWITCH
	ELECTRICAL LIGHTING ELEMENT
	DETECTOR
	SMOKE DETECTOR
	SECURITY CAMERA - CEILING
	DRAWING NOTE
	HOMERUN TO PANEL-LETTER AND NO. INDICATES CIRCUIT NUMBER. NO. OF CROSSLINES INDICATES NO. OF CONDUCTORS WHEN MORE THAN 3.
	CONDUIT - IN CEILING OR WALLS
	CONDUIT - IN OR UNDER FLOOR
	TELEVISION - COMBINATION RECEPTACLE / TV CABLE - WALL, CEILING
	FLUORESCENT
	SPEAKER - CEILING
	DOOR BELL CHIME
	FIRE ALARM DEVICE - VISUAL/AUDIBLE - WALL, CEILING
	FIRE ALARM DEVICE - AUDIBLE/HORN
	FIRE ALARM DEVICE - VISUAL - WALL
	FIRE ALARM DEVICE - VISUAL - CEILING
	FIRE ALARM DEVICE - VISUAL/FULLSTATION
	FIRE ALARM DEVICE - FULLSTATION
	TAMPER VALVE POSITION AND FLOW SWITCHES

WALL COLOR	FINISH COLOR
GRAY	SWITCH - GRAY COVERPLATE - GRAY UNSWITCHED RECEPTACLE - GRAY SWITCHED RECEPTACLE - RED
WHITE	SWITCH - WHITE COVERPLATE - WHITE UNSWITCHED RECEPTACLE - WHITE SWITCHED RECEPTACLE - RED
CEILING	MATCH SURROUNDING FINISH
NON-METALLIC FLOOR BOX	BRUSHED ALUMINUM COVER PLATE

LIGHTING NOTES (CONTROLS):

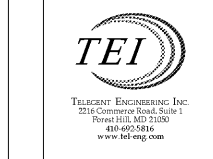
- ALL OCCUPANCY SENSORS SHALL TIMEOUT AFTER A 10 (TEN) MINUTE TIME PERIOD.
 - OCCUPANCY SENSORS SHALL BE CAPABLE OF MANUAL ON/AUTOMATIC OFF OPERATION.
 - OCCUPANCY SENSORS SHALL BE POSITIONED AND ADJUSTED SO THE SENSOR STATUS INDICATOR BLINKS WHEN ROOM IS OCCUPIED AND ACTIVATES WHEN PERSON BREAKS THE PLANE OF THE DOORWAY.
 - OCCUPANCY SENSORS SHALL NOT TRIP LIGHTS ON WHEN PERSON PASSES AN OPEN DOORWAY.
- LIGHTING SEQUENCE OF OPERATIONS:**
- LIGHTING OVERRIDE (AFTER HOURS - HOLDING AREAS) FUNCTION SHALL BE CONTROLLED THROUGH ENERGY MANAGEMENT SYSTEM (EMS) TIMECLOCK SWITCH AND INTERLOCKED WITH HIGH ENERGY MANAGEMENT SYSTEM (EMS) SECURITY SYSTEM. LIGHTS SHALL BE DISARMED OR IN ALARM CONDITION WHEN ARMED.
 - GENERAL LIGHTING (SALES AREA) SHALL BE CONTROLLED THROUGH ENERGY MANAGEMENT SYSTEM (EMS) TIMECLOCK SWITCH FOR (ONE) HOUR ON BEFORE STORE OPENING, AND OFF (ONE) HOUR AFTER STORE CLOSING. TRACK LIGHTING - DEFINED AS ADJUSTABLE CEILING AND SURFACE MOUNTED TRACK LIGHTING IN SALES AREA.
 - EXTERIOR SIGN LIGHTING SHALL BE CONTROLLED THROUGH ENERGY MANAGEMENT SYSTEM (EMS) TIMECLOCK SWITCH FOR (ONE) HOUR ON BEFORE STORE OPENING, AND OFF (ONE) HOUR AFTER STORE CLOSING. EXTERIOR LIGHTING - DEFINED AS EXTERIOR BUILDING WALL MOUNTED AND PARKING LOT LIGHTING.
 - ANY AND ALL BACK OF HOUSE LIGHTING (BOH) FIXTURES SHALL BE CONTROLLED BY WALL OR CEILING MOUNTED OCCUPANCY SENSORS BACK OF HOUSE - DEFINED AS OFFICES, BREAK AREA, INVENTORY, HALL, BATHROOMS, WORK AREA, ETC.

ABBREVIATIONS

GRD	- GROUND	DWS	- DRAWING
MH.	- MOUNTING HEIGHT	G, CDT	- CONDUIT
AFF	- ABOVE FINISHED FLOOR	T	- TRANSFORMER
GF1	- GROUND FAULT INTERRUPTER	NL	- NIGHT LIGHT
IG	- ISOLATED GROUND	LTS	- LIGHTS
TYP	- TYPICAL	RECP	- RECEPTACLE
S.O.N.	- SCOPE OF WORK	CLS	- CEILING
V.I.F.	- VERIFY IN FIELD	N.I.C.	- NOT IN CONTRACT
MFR	- MANUFACTURER		
AHJ	- AGENCY (AUTHORITY) HAVING JURISDICTION		
LCP	- LIGHTING CONTROL PANEL		
NRTL	- NATIONALLY RECOGNIZED TESTING LABORATORY		



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Specifications & Electrical Symbols List

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