Luminaire Schedule										
Type	Description	Manufacturer / Series	Housing / Mounting	Lamp Qty	Lamp Type	Ballast / Driver	Finish	Comments	Fixture Load	Voltage

ELECTRIC LEGEND

SYMBOL	DESCRIPTION
LIGHTING AND LIGHTING CONTROLS	
	LUMINAIRE (REFER TO THE LUMINAIRE SCHEDULE) NOTE THAT OTHER SHAPES MAY ALSO BE USED TO REPRESENT LUMINAIRES
	SHADED LUMINAIRES DENOTE THOSE CONNECTED TO EMERGENCY OR STANDBY POWER AS APPLICABLE (UNSWITCHED LUMINAIRES ARE EGRESS LIGHTS AND/OR NIGHT-LIGHTS THAT OPERATE 24/7)
	TRACK LIGHTING IN LENGTH SHOWN AND WITH NUMBER OF LUMINAIRE HEADS AS INDICATED PROVIDE ALL REQUIRED ACCESSORIES (FITTINGS, END CAPS, POWER FEEDS, ETC.)
	CEILING FAN
WALL MOUNT	SINGLE / DOUBLE SIDED EXIT SIGN CONNECT AHEAD OF SWITCHING & CONFIGURE ARROWS TO INDICATE DIRECTION OF EGRESS TRAVEL
	EMERGENCY LIGHTING UNIT WITH 90-MINUTE BATTERY BACKUP AND ASSOCIATED REMOTE HEADS WHERE APPLICABLE. CONNECT TO LOCAL LIGHTING CIRCUIT AHEAD OF SWITCHING
	OUTDOOR AREA SITE LIGHTING STANDARD NUMBER OF LUMINAIRE HEADS AS INDICATED ON DRAWINGS.
a NL / a EL	A = LUMINAIRE TYPE, NL = NIGHT-LIGHT (UNSWITCHED), a = SWITCHING DESIGNATION, EL = EGRESS LUMINAIRE (ILLUMINATES PATH OF EGRESS, UNSWITCHED UNLESS OTHERWISE NOTED)
	LIGHTING SWITCH (KEYS): 2 = 2-POLE, 3 = 3-WAY, 4 = 4-WAY, D=DIMMER, K=KEYED, T = TIMER SWITCH, M = MOMENTARY-CONTACT, P = SWITCH W/ PILOT LIGHT)
TYPE	CEILING-MOUNTED OCCUPANCY SENSOR. DUAL TECHNOLOGY UNLESS OTHERWISE NOTED BY TYPE. TYPE "IR" = INFRARED, TYPE "US" = ULTRASONIC
TYPE#	WALL-MOUNTED OCCUPANCY SENSOR SWITCH. DUAL TECHNOLOGY UNLESS OTHERWISE NOTED BY TYPE. TYPE "IR"=INFRARED, TYPE "US"=ULTRASONIC, "V"=VACANCY SENSOR, "#" = CONTROLLED CIRCUITS.
TYPE	WALL-MOUNTED OCCUPANCY SENSOR. INFRARED TECHNOLOGY UNLESS OTHERWISE NOTED BY TYPE. TYPE "US" = ULTRASONIC, TYPE "DT" = DUAL TECHNOLOGY
PC	PHOTOCELL / LIGHT-SENSOR / PHOTO-SENSOR
LCP# LCP#	LIGHTING CONTROL PANEL
KEY	LIGHTING CONTROL DIGITAL SWITCH OR CONTROL INTERFACE. "KEY" DENOTES SWITCH DESIGNATION DETAILED ON DRAWINGS
IR	LIGHTING CONTROL SYSTEM - CEILING-MOUNTED INFRARED RECEIVER/SENSOR
LR	AUTOMATIC LOAD CONTROL RELAY DEVICE
LT	EMERGENCY LIGHTING TRANSFER SWITCH DEVICE - 20A BRANCH CIRCUIT RATED
RECEPTACLES AND MISCELLANEOUS OUTLETS	
	SINGLE ("SIMPLEX"), DUPLEX, AND DOUBLE DUPLEX ("QUAD") RECEPTACLE RESPECTIVELY
	RECEPTACLES ON EMERGENCY OR STANDBY POWER CIRCUIT DIAMOND OUTLINE MAY BE APPLIED TO ANY SPECIALTY RECEPTACLE SYMBOL
	GFI / GFCI RECEPTACLES
	SURGE PROTECTIVE DEVICE RECEPTACLES
	ISOLATED GROUND RECEPTACLES
	RECEPTACLES WITH USB OUTLETS
	HALF SWITCHED RECEPTACLES
	FULL SWITCHED RECEPTACLES
	REGRESSED ("CLOCK HANGER") RECEPTACLES
	CEILING MOUNTED RECEPTACLES
TYPE	FLOOR OUTLET - POWER AND / OR TECHNOLOGY
	SPECIAL PURPOSE RECEPTACLE
	POWER WHIP CONNECTION TO SYSTEM FURNITURE
	CEILING DUPLEX RECEPTACLE WITH ADJACENT REEL-MOUNTED DROP CORD.
	RECEPTACLE ATTRIBUTES 42" = MOUNT RECEPTACLE AT THIS HEIGHT ABOVE GRADE / FINISHED FLOOR C = INSTALL ABOVE COUNTER AND BACKSPLASH H = INSTALL RECEPTACLE HORIZONTALLY L = LIT (PROVIDE ILLUMINATED FACE OR INDICATOR LIGHT TO INDICATE THERE IS POWER TO RECEPTACLE) SW = SPLIT WIRED T = TAMPER-RESISTANT W = WEATHER PROOF WHILE IN USE COVER AND WEATHER RESISTANT RECEPTACLE
DOOR OPERATORS/DEVICES	
SJ	SECURITY JUNCTION BOX - WALL-MOUNT ABOVE ACCESSIBLE CEILING ON SECURE SIDE OF DOOR
	ELECTRIC DOOR OPERATOR MANUAL (LEFT) AUTOMATIC (RIGHT)
	PUSH PLATE FOR MANUAL CONTROL OF ELECTRIC DOOR OPERATOR
	SINGLE-ENTRANCE TYPE HORN DOOR SIGNAL AND TRANSFORMER WITH ASSOCIATED PUSHBUTTON(S)
	SINGLE-ENTRANCE HORN/STROBE DOOR SIGNAL AND TRANSFORMER WITH ASSOCIATED PUSHBUTTON(S)
	2-ENTRANCE TYPE ELECTRIC DOOR CHIME AND TRANSFORMER WITH ASSOCIATED PUSHBUTTON(S)
	DOOR BELL WITH TRANSFORMER & PUSHBUTTONS
	FLUSH PUSHBUTTON FOR DOOR CHIME OR BELL

ELECTRIC LEGEND

SYMBOL	DESCRIPTION
MISCELLANEOUS	
T / TS	LOW VOLTAGE THERMOSTAT (LEFT) AND TEMPERATURE SENSOR (RIGHT)
T / TF	LINE VOLTAGE THERMOSTAT (LEFT) AND REVERSE ACTING THERMOSTAT (RIGHT)
H / HS	HUMIDITY STAT (LEFT) AND HUMIDITY SENSOR (RIGHT)
P / PS	PRESSURE STAT (LEFT) AND PRESSURE SENSOR (RIGHT)
ANSI	ANSUL MANUAL PULL STATION (REFER TO SPECIFICATION 260584.00 FOR REQUIRED WORK)
	INDICATES DIRECT CONNECTION TO EQUIPMENT
$ / $MS / $MSR	MOTOR RATED TOGGLE SWITCH, MANUAL STARTER WITH PILOT LIGHT, AND MANUAL STARTER WITH PILOT LIGHT WITH EXTERNAL RELAY FOR CONTROL OR MONITORING RESPECTIVELY - ALL MAY BE KEYED "K"
	HEAVY DUTY DISCONNECT SWITCH (NON-FUSED) (LEFT) HEAVY DUTY DISCONNECT SWITCH (FUSED) (RIGHT)
	ENCLOSED CIRCUIT BREAKER
	COMBINATION DISCONNECT SWITCH AND MAGNETIC STARTER W/ PILOT LIGHT, AUXILIARY CONTACTS AND H.O.A. SWITCH
	MOTOR
VFD	VARIABLE FREQUENCY DRIVE / VARIABLE SPEED DRIVE
	LINE VOLTAGE MOTOR OPERATED DAMPER
	EMERGENCY-POWER-OFF (EPO) PUSHBUTTON STATION WITH DESCRIPTIVE ENGRAVED PLATE AND MEANS TO PREVENT ACCIDENTAL ACTIVATION
	CONTROL STATION WITH DESCRIPTIVE ENGRAVED PLATE
TC	TIME CLOCK FOR PROGRAMMABLE TIME-OF-DAY AND EXTENDED CONTROL
R	ENCLOSED RELAY
C	CONTACTOR
	HAND DRYER
	PLYWOOD EQUIPMENT BOARD
FRONT	ELECTRICAL SWITCHBOARD OR SWITCHGEAR (DIMENSIONS MAY VARY)
	ELECTRICAL PANELBOARD OR DISTRIBUTION BOARD (DIMENSIONS MAY VARY / FLUSH OR SURFACE MOUNTED AS INDICATED)
FRONT	DRY TYPE TRANSFORMER - FLOOR MOUNTED ON CONCRETE PAD (LEFT), SUSPENDED FROM CEILING OR WALL (RIGHT)
PAD / POLE	OIL FILLED TRANSFORMER
	CONCRETE FILLED STEEL BOLLARD
	GROUND ROD - ROD ONLY (LEFT), WITH INSPECTION WELL (RIGHT)
SINGLE LINE DIAGRAM	
	ELECTRIC UTILITY COMPANY METER AND ASSOCIATED CURRENT TRANSFORMERS
HD	CUSTOMER ELECTRIC METER AND ASSOCIATED CURRENT TRANSFORMERS HD = HIGH DENSITY METERING CABINET-BANK MOUNTED TO TIGHTLY GROUP ALL METERS TOGETHER
	GROUNDING ELECTRODE PER NFPA 70 ARTICLE 250 MINIMUM
	ENCLOSED CIRCUIT BREAKER
	HEAVY DUTY DISCONNECT SWITCH (NON-FUSED)(LEFT) (FUSED)(RIGHT) SIZES MAY BE SHOWN ONLY IN SCHEDULE
	ELECTRICAL PANELBOARD OR DISTRIBUTION BOARD
	ELECTRICAL SWITCHBOARD OR SWITCHGEAR
	AUTOMATIC TRANSFER SWITCH
	SURGE PROTECTIVE DEVICE
ENVIRONMENTAL CONTROLS AND ALARMS	
	CARBON MONOXIDE ALARM DEVICE - MULTI-STATION
CO / VOC / EMR	ENVIRONMENTAL CONTROL PANEL CO = CARBON MONOXIDE, VOC = VOLATILE ORGANIC COMPOUNDS, M = METHANE, R = REFRIGERANT LEAKAGE
VOC	VOLATILE ORGANIC COMPOUNDS (VOC) SENSOR (MONITORED BY ENVIRONMENTAL CONTROL PANEL)
CO	CARBON MONOXIDE SENSOR (MONITORED BY ENVIRONMENTAL CONTROL PANEL)
RL	REFRIGERANT LEAK DETECTION SENSOR (MONITORED BY REFRIGERANT LEAK DETECTION CONTROL PANEL)
VOC / CO / M / R	ENVIRONMENTAL AUDIO / VISUAL ALARM DEVICE - WALL CO = CARBON MONOXIDE, VOC = VOLATILE ORGANIC COMPOUND, M = METHANE, R = REFRIGERANT LEAKAGE
VOC / CO / M / R	ENVIRONMENTAL AUDIO / VISUAL ALARM DEVICE - CEILING / OVERHEAD MOUNTED CO = CARBON MONOXIDE, VOC = VOLATILE ORGANIC COMPOUND, M = METHANE, R = REFRIGERANT LEAKAGE

ELECTRIC LEGEND

SYMBOL	DESCRIPTION
WIRE / CABLE / RACEWAY	
LPA-1,3	BRANCH CIRCUIT HOME RUN WITH PANEL NAME AND CIRCUIT NUMBER(S)
	CABLING / RACEWAY INSTALLED CONCEALED IN WALLS OR ABOVE CEILING
	CABLING / RACEWAY INSTALLED BELOW FLOOR OR GRADE
	CABLE TRAY
	FEEDER DUCT / BUS DUCT
J	JUNCTION BOX ABOVE ACCESSIBLE CEILING JUNCTION BOX AT OVERHEAD STRUCTURE IN AREAS WITH NO CEILING
F	FLUSH MOUNTED JUNCTION BOX OR PULL BOX AS APPLICABLE FOR APPLICATION
P	FLUSH-MOUNTED PULL BOX
MH	MANHOLE
	UTILITY POLE
	SINGLE-SERVICE SURFACE RACEWAY (ONE COMPARTMENT - POWER)
	MULTI-SERVICE SURFACE RACEWAY (TWO COMPARTMENT - POWER AND TECHNOLOGY)
	SURFACE RACEWAY WITH INTEGRAL RECEPTACLES ("PLUGSTRIP")
	SERVICE POLE - POWER AND TECHNOLOGY WHERE APPLICABLE.
UP / DN	CONDUIT UP OR DOWN
ABBREVIATIONS	

42"	DISTANCE ABOVE FINISHED FLOOR / GRADE / PAVEMENT	LR	LEGALLY REQUIRED STANDBY
AF	AMP FRAME OF FUSED SWITCH OR CIRCUIT BREAKER	LI LSI	LONG - INSTANTANEOUS LONG - SHORT - INSTANTANEOUS
AFCI	ARC-FAULT CIRCUIT INTERRUPTER	LSIG	LONG - SHORT - INSTANTANEOUS - GROUND FAULT
AT	AMP TRIP OF FUSED SWITCH OR CIRCUIT BREAKER	MCB	MAIN CIRCUIT BREAKER
ATS	AUTOMATIC TRANSFER SWITCH	MFR MLO	MANUFACTURER MAIN LUGS ONLY
BAS	BUILDING AUTOMATION SYSTEM	MTS MW	MANUAL TRANSFER SWITCH MICROWAVE OVEN
C.T.C.	WORK UNDER DIVISION 27 OR 28 AS APPLICABLE	NIC	NOT IN CONTRACT (SHOWN FOR REFERENCE ONLY)
C'B	CIRCUIT BREAKER	NTS	NOT TO SCALE
C / CH	COUNTER HEIGHT OR SPECIAL HEIGHT DEVICE	OFE	OWNER-FURNISHED EQUIPMENT - INSTALLED AND WIRED BY E.C.
DW	DISHWASHER	OS	OPTIONAL STANDBY
E	EMERGENCY	P.C.	WORK UNDER DIVISION 22
E.C.	WORK UNDER DIVISION 26	(R)	RELOCATE
EMS	ENERGY MANAGEMENT SYSTEM	S.C.	WORK UNDER DIVISION 21
EPO	EMERGENCY POWER OFF	SCCR	SHORT CIRCUIT CURRENT RATING
ER	EQUIPMENT ROOM	SPD	SURGE PROTECTIVE DEVICE
ERM	ENERGY REDUCTION MAINTENANCE SWITCH	ST	SHUNT TRIP
ESP	EMERGENCY STANDBY RATING	TAAC	TO ABOVE ACCESSIBLE CEILING
ETR	EXISTING TO REMAIN	TR	TAMPER RESISTANT
EWC	ELECTRIC WATER COOLER	TTB	TELEPHONE TERMINAL BOARD
EX.	EXISTING	TYP	TYPICAL
FBO	FURNISHED BY OTHERS - INSTALLED AND WIRED BY E.C.	UCR	UNDER COUNTER REFRIGERATOR
FIBO	FURNISHED AND INSTALLED BY OTHERS - WIRED BY E.C.	UL	UNDERWRITER'S LABORATORY
FP	RECEPTACLE TO BE USED FOR A FLAT PANEL DISPLAY.	U.L.S.E.	LISTED FOR SERVICE ENTRANCE
FWE	FURNISHED WITH EQUIPMENT BY OTHERS - INSTALLED AND WIRED BY E.C.	UNO	UNLESS NOTED OR INDICATED OTHERWISE ON DRAWINGS OR IN SPECIFICATIONS
GD	GARBAGE DISPOSAL	VFD / VSD	VARIABLE FREQUENCY / SPEED DRIVE
GFEP	GROUND FAULT EQUIPMENT PROTECTION	VIF	VERIFY IN FIELD
GFI / GFCI	GROUND FAULT CIRCUIT INTERRUPTER DEVICE	VM	VENDING MACHINE
GND	GROUND	VP	VANDAL PROOF
H.C.	WORK UNDER DIVISION 23	W / WP	WEATHERPROOF
H.O.A.	"HAND - OFF - AUTO" SWITCH	WG	WIRE GUARD
IG	ISOLATED GROUND	WR	WEATHER RESISTANT
Isc	SHORT CIRCUIT CURRENT	X	RATED FOR CLASSIFIED LOCATION

PLAN-VIEW AND GRAPHIC LINE TYPES

	WORK SHOWN BOLD-CONTINUOUS INDICATES NEW WORK (UNLESS OTHERWISE INDICATED)
	WORK SHOWN FADED INDICATES EXISTING WORK TO REMAIN OR NEW WORK BY OTHERS AS APPLICABLE (UNLESS OTHERWISE INDICATED)
	WORK SHOWN BOLD-DASHED INDICATES SELECTIVE DEMOLITION WORK (UNLESS OTHERWISE INDICATED)

DRAWING SET APPEARANCE

TO BETTER COMMUNICATE SCOPE TO PERMIT AGENCIES AND CONTRACTORS, EACH DRAWING IN THIS DRAWING SET HAS BEEN CREATED IN BOTH "COLOR" AND "BLACK AND WHITE". THERE EXISTS A COLOR LAYER WITHIN EACH DRAWING WHERE VISIBILITY IS CONTROLLED THROUGH THE .PDF LAYER MANAGER. THIS LAYER VISIBILITY CAN BE TOGGLED DISPLAYING EITHER "COLOR" OR "BLACK AND WHITE". TO MAINTAIN SCOPE BASED SHADING WHEN PRINTING TO PAPER, BLACK AND WHITE NEEDS TO BE VISIBLE.
FOR FURTHER INSTRUCTIONS, REFER TO CONTRACTOR RESOURCES ON OUR WEBSITE AND DOWNLOAD "DRAWING COLOR INSTRUCTIONS".
WWW.KLHENGRS.COM - CONTRACTOR RESOURCES (RIGHT HAND SIDE OF PAGE).

TECHNOLOGY LEGEND

SYMBOL	DESCRIPTION
TECHNOLOGY (ROUGH-IN ONLY)	
	COORDINATE WITH SYSTEM INSTALLERS PRIOR TO INSTALLATION FOR LOCATIONS, HEIGHTS, CONDUIT TERMINATIONS, ETC. ALL OUTLET BOXES FOR ROUGH-IN SHALL BE MINIMUM 2-1/4" DEEP.
	COMMUNICATION OUTLET - VOICE, DATA, DATA/VOICE RESPECTIVELY LEFT TO RIGHT - PROVIDE 4"X4" BOX WITH 1-GANG RING AND (1) 1" CONDUIT TO ABOVE ACCESSIBLE CEILING UNLESS NOTED OTHERWISE.
WAP	CEILING COMMUNICATION OUTLET - VOICE, DATA, DATA/VOICE RESPECTIVELY LEFT TO RIGHT - PROVIDE 4"X4" BOX WITH 1-GANG RING AND (1) 1" CONDUIT TO ABOVE ACCESSIBLE CEILING UNLESS NOTED OTHERWISE. "WAP" = WIRELESS ACCESS POINT.
	RF TELEVISION DATA/RF OUTLET - PROVIDE 4"X4" BOX WITH 1-GANG RING AND (1) 1" CONDUIT TO ABOVE ACCESSIBLE CEILING UNLESS NOTED OTHERWISE.
	WALL MOUNT AND CEILING MOUNT SECURITY CAMERA RESPECTIVELY LEFT TO RIGHT - PROVIDE 4"X4" BOX WITH 2-GANG RING AND (1) 1" CONDUIT TO ABOVE ACCESSIBLE CEILING UNLESS NOTED OTHERWISE.
	SECURITY DEVICE - KEYPAD, PROXMITY READER RESPECTIVELY LEFT TO RIGHT - PROVIDE 4"X4" BOX WITH 1-GANG RING AND (1) 1" CONDUIT TO ABOVE ACCESSIBLE CEILING UNLESS NOTED OTHERWISE.

ELECTRIC DESIGN CRITERIA

APPLICABLE BUILDING CODES

2017 OHIO BUILDING CODE (BASED ON THE INTERNATIONAL BUILDING CODE)
2017 NFPA 70 - NATIONAL ELECTRICAL CODE (NEC)
2012 INTERNATIONAL ENERGY CONSERVATION CODE (IECC)

TESTING/COMMISSIONING FOR LIGHTING CONTROLS

LIGHTING CONTROL DEVICES AND SYSTEMS SHALL BE TESTED TO ENSURE THE HARDWARE AND SOFTWARE IS CALIBRATED, PROGRAMMED, AND IN PROPER WORKING ORDER. INSTALLING CONTRACTOR SHALL BE RESPONSIBLE FOR ALL REQUIRED INSTALLATION REPORTS AND CERTIFICATES (UNLESS COMMISSIONING IS BEING PERFORMED IN WHICH CASE THE COMMISSIONING PROVIDER SHALL BE RESPONSIBLE FOR ALL REPORTS, CERTIFICATES, ETC.) AND SHALL PROVIDE MANUALS FOR LIGHTING CONTROL DEVICES TO OWNER PRIOR TO PROJECT CLOSE-OUT. INSTALLING CONTRACTOR SHALL BE RESPONSIBLE FOR CONTRACTING WITH APPROPRIATE PARTIES TO ARRANGE FOR TESTING OF THE LIGHTING CONTROL SYSTEMS AND SHALL BE RESPONSIBLE FOR ENSURING ALL REQUIRED FUNCTIONAL PERFORMANCE TESTING FORMS/REPORTS ARE COMPLETED AND SUBMITTED TO THE OWNER AND LOCAL AHJ PRIOR TO PROJECT CLOSE-OUT. FUNCTIONAL PERFORMANCE TESTING OF LIGHT CONTROLS SHALL FOLLOW THE REQUIREMENTS LISTED IN THE APPLICABLE ENERGY CODE INCLUDING (BUT NOT LIMITED TO) VERIFICATION OF THE PERFORMANCE OF OCCUPANCY SENSORS, AUTOMATIC TIME SWITCHES, AND DAYLIGHT HARVESTING CONTROLS.

ENERGY MANAGEMENT SYSTEM (EMS) LEGEND

(APPLIES ONLY FOR EMS DRAWING SHEETS)

SYMBOL	DESRIPTION	NOTE	CABLE/CONDUCTORS
DT	DEFROST CONDUIT	PROVIDE OUTLET BOX AT CASE. PROVIDE WIRING FROM CASE TO RESPECTIVE DANFOSS "RC" PANEL. SEE DEFROST WIRING SCHEDULE. PROVIDE WIRING IN 1" CONDUIT FOR WALK-IN COOLERS/FREEZERS AND ALL OTHER APPLICATIONS. FOR REFRIGERATED CASES PROVIDE WIRING FROM CASE TO RESPECTIVE SINGLE PHASE OR THREE PHASE CONNECTION POINT PER RISD-13 (WHERE APPLICABLE), OR DIRECTLY TO PROTOCOL UNIT SEE DEFROST WIRING SCHEDULE FOR DEFROST CIRCUIT PHASE. IN ADDITION, PROVIDE 1" CONDUIT FOR KLIXON UNITS. KLIXON UNITS TO BE WIRED IN SERIES PER REFRIGERATION CIRCUIT WITH A SINGLE HOME RUN TO "RC" PER CIRCUIT.	SEE DEFROST WIRING SCHEDULE ON EMS SHEETS. REFER TO SPECIFICATION 26.05.19 FOR CABLING REQUIREMENTS AND ADDITIONAL INFORMATION.
SS	SUCTION STOP SOLENOID	PROVIDE OUTLET BOX AT CASE. PROVIDE CABLE IN 1" CONDUIT FROM SOLENOID TO RESPECTIVE "RC" CONTROL PANEL. SOLENOID SHALL BE FURNISHED & INSTALLED BY REFRIGERATION CONTRACTOR.	
TS	TEMPERATURE SENSOR (REFRIGERATION)	PROVIDE OUTLET BOX AT CASE. PROVIDE CABLE FROM SENSOR TO RESPECTIVE "RC" CONTROL PANEL. PROVIDE 1" CONDUIT TO JOIST SPACE OR ABOVE CEILING, THEN FREE-WIRED TO JOIST SPACE. CABLE IN JOIST SPACE TO BE FREE-WIRED.	REFER TO SPECIFICATION 26.05.19 FOR CABLING REQUIREMENTS AND ADDITIONAL INFORMATION. REFER TO REFRIGERATION INSTALLATION SPECS FOR FREE-WIRED REQUIREMENTS.

WHERE REFRIGERATION EQUIPMENT IS SERVED FROM A PROTOCOL UNIT, ROUTE TO RESPECTIVE PROTOCOL UNIT'S "RC" CONTROL PANEL.

IN THE NOTES STATED ABOVE, PROVIDE SHALL MEAN FURNISH AND INSTALL.

PROVIDE AND WIRE ALL ADDITIONAL CONTACTORS, RELAYS AND ADDITIONAL ENCLOSURES NECESSARY FOR A FULLY WORKING DEFROST SYSTEM.

ENERGY MANAGEMENT SYSTEM (EMS) LEGEND NOTES

A. WHERE REFRIGERATION EQUIPMENT IS SERVED FROM A "SYSTEM", ROUTE TO "RC" CONTROL PANEL IN REAR COMPRESSOR ROOM.
B. WHERE REFRIGERATION EQUIPMENT IS SERVED FROM RACK "A" OR RACK "B", ROUTE TO RESPECTIVE RACK'S "RC" CONTROL PANEL IN REAR COMPRESSOR ROOM.
C. WHERE REFRIGERATION EQUIPMENT IS SERVED FROM A PROTOCOL UNIT, ROUTE TO RESPECTIVE PROTOCOL UNIT'S "RC" CONTROL PANEL.
D. IN THE NOTES STATED ABOVE, PROVIDE SHALL MEAN FURNISH AND INSTALL.
E. "EC" TO REFER TO BUILDING ELECTRICAL CONTRACTOR BIDDING TO THE GENERAL CONTRACTOR, "FEC" TO REFER TO FIXTURING ELECTRICAL CONTRACTOR SEPARATELY BIDDING EQUIPMENT TO KROGER, FOR ALL REMODELS AND EXPANSIONS, BEC AND FEC RESPONSIBILITIES WILL BE COMBINED AND FALL TO THE ELECTRICAL CONTRACTOR BIDDING TO THE GENERAL CONTRACTOR.
F. FEC TO PROVIDE AND WIRE ALL ADDITIONAL CONTACTORS, RELAYS AND ADDITIONAL ENCLOSURES NECESSARY FOR A FULLY WORKING DEFROST SYSTEM. REFER TO HUSSMAN EQUIPMENT SCHEDULES FOR PROTOCOL SYSTEMS AS THESE ARE TYPICALLY PROVIDED WITH THE PROTOCOL. FOR RACK AND PARALLEL SYSTEMS, ASSUME NONE ARE PROVIDED BY THE MANUFACTURER.
G. REFER TO REFRIGERATION CONTROL EQUIPMENT RESPONSIBILITY SCHEDULE ON E1.3 SERIES DRAWINGS FOR RESPONSIBILITIES OF ALL LOW VOLTAGE CABLING AND OTHER EMS SPECIALTIES.

GENERAL ELECTRICAL PROJECT NOTES

A. PROVIDE ALL JUNCTION BOXES, CONDUIT, WIRE, INSTALLATIONS, TERMINATIONS, ETC. AS NECESSARY FOR COMPLETE OPERATIONAL INSTALLATION OF KROGER-FURNISHED MATERIALS.
B. ELECTRICAL CONTRACTOR RESPONSIBILITIES FOR KROGER SUPPLIED MATERIALS SHALL BE AS FOLLOWS.
   a. RECEIVE, UNLOAD, STORE AND PROTECT PRODUCT ON SITE.
   b. INSPECT PRODUCTS UPON RECEIPT FOR SHORTAGES, DAMAGES OR DEFECTS AND NOTIFY SUPPLIER WITHIN 24 HOURS.
   c. NOTIFY SUPPLIER WITHIN 20 DAYS OF RECEIPT OF ANY HIDDEN DAMAGES FOR PRODUCTS REVIEWED.
C. NEATLY INSTALL ALL CONDUIT, CABLES, ETC. PARALLEL AND PERPENDICULAR TO BUILDING STEEL.
D. ALL ELECTRICAL DEVICES, OUTLETS, JUNCTION BOXES, ETC. THAT ARE SHOWN AGAINST A WALL SHALL BE FLUSH MOUNTED IN THE WALL (i.e. RECESSED IN WALL SO OPENING IS FLUSH WITH FINISHED WALL SURFACE). REFER TO EQUIPMENT SCHEDULE FOR MOUNTING HEIGHTS AND ADDITIONAL INFORMATION. ALSO SEE DETAILS ON SHEET E5-SERIES WHERE APPLICABLE.
E. INSTALL ELECTRICAL OUTLETS FOR REFRIGERATION ISLAND CASES IN A STRAIGHT LINE ALIGNED WITH THE HUB DRAWING. COORDINATE WITH PLUMBING DIMENSIONS SIGNED PLAN.
F. PROVIDE 10 FEET OF FLEXIBLE CONDUIT FOR REFRIGERATED CASES SERVED FROM WALL JUNCTION BOXES FOR CONNECTION TO CASES BY THE PHASE II EQUIPMENT CONTRACTOR.
G. PROVIDE MINIMUM #12AWG/THHN BRANCH CIRCUIT WIRING.
H. REGARDLESS OF WHERE JB's ARE SHOWN ON DRAWINGS, FEED CASES FROM WALL WHEREVER CASES ARE LOCATED AGAINST A WALL. INSTALL WALL OUTLET/JUNCTION BOXES FOR SUCH CASES SO THAT BOTTOMS OF BOXES ARE TWO (2) INCHES ABOVE TOP OF RESPECTIVE CASE (FIELD VERIFY).
I. NEW WORK SHOWN ON DRAWINGS IS SHOWN TO INDICATE MINIMUM REQUIREMENTS FOR THE NEW EQUIPMENT LAYOUT. EXISTING CONDUIT/OUTLET WORK MAY BE RE-USED WHEREVER POSSIBLE, SUBJECT TO BEING EQUIVALENT TO THE NEW WORK REQUIREMENTS SHOWN.
J. SAWCUT AND NEATLY PATCH (IN-KIND) EXISTING FLOOR SLAB AS REQUIRED FOR NEW UNDERFLOOR DUCT SYSTEM, ISLAND RELATED WORK, CHECKOUT AREA RACEWAYS, NEW GONDOLA/SHELVING RUNS, ETC.
K. ANY SPARE OR UNUSED CIRCUIT BREAKERS SHALL BE SET TO THE "OFF" POSITION AT PROJECT CLOSE OUT.

2" REFERENCE LINE

KLH ENGINEERS
KOHRS LONNEMANN HEIL ENGINEERS, INC.
MECHANICAL/ELECTRICAL ENGINEERS
WWW.KLHENGRS.COM
1538 ALEXANDRIA PIKE, SUITE 11
FT. THOMAS, KENTUCKY 41075
800-354-9783
859-442-8050
859-442-8058 FAX
LEXINGTON, KENTUCKY
LOUISVILLE, KENTUCKY
COLUMBUS, OHIO

#	Date	Change Description

KROGER N641
2028 E HARBOR RD
PORT CLINTON, OH 43452
for
THE KROGER COMPANY

MOODY•NOLAN
300 Spruce Street
Suite 300
Columbus, Ohio 43215
Phone: (614) 461-4664
Fax: (614) 280-8881
www.moodynolan.com

Dwg. Coord.: CJC | Tech. Coord.: JAT | Proj #: 25835.00

ELECTRICAL ABBREVIATIONS, SYMBOLS, AND GENERAL NOTES

E0.1

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