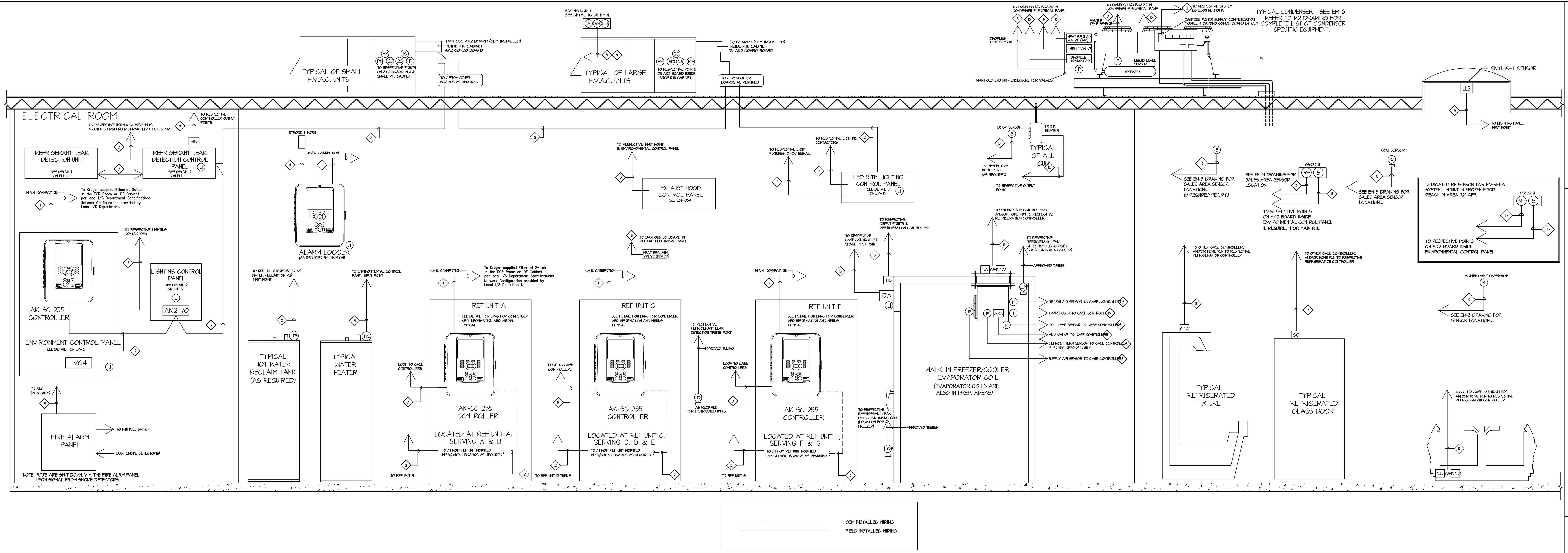


1 ENERGY MANAGEMENT SYSTEM REQUIREMENTS

SCALE: NONE

REFRIGERANT LEAK DETECTION			
Kroger Item #	**Description**	**Supplier Part ID**	**Qty**
K-0005955	AK2 Enclosure for 1 row of 4 full size Modules Includes Power Supply and 1AK2 Comm Module 13x30x5	AK2I08	1
K-0005947	AK2 Module Type AK2-XM 205A (8AI/8DO)	080Z0010	2
K-0005980	150 VA Wall Mount Control Transformer - 24V	55-168	1
K-0052368	Bacharach 16Ch HGM MZ, 5x 1,000' Tubing,10 High Flow Fittings, 2 & 3 way splitter connections with line end filter assembly, Machine room binder with technical bulletins and parts guide (Includes Filter Ends)	3015-KIT	1
K-0052369	4- 20v Interface Card (Danfoss compatible)	3015-5152	1
K-0052371	Washdown J-box for filter ends.	3015-5748	4
K-0052370	Tubing- 1,000' roll (Not for NH3)	TG100	EXTRA IF REQ'D
K-0052372	Line End Filter Assembly (Includes filter & tubing connection)	3015-3420	EXTRA IF REQ'D
K-0052397	TYPE BLUE HORN STROBE MTWPB-2475W-NW	BLUE HORN STROBE	1 FOR OFFICES, 1 NEAR LDU, 1 PER MECH ROOM, 1 PER BOX (CODE MAY REQUIRE 2 PER BOX, INSIDE AND OUTSIDE)
LIGHTING CONTACTOR CONTROL			
Kroger Item #	**Description**	**Supplier Part ID**	**Qty**
K-0005936	Lighting Control Kit, includes: Enclosure w/ power supply,~One (1) 8DO, Two (2) 8AI/8DO w/ comm module and indoor photocell (photo-mas), overided timer and terminal blocks.	080Z2595KT	1
K-0005980	150 VA Wall Mount Control Transformer - 24V	55-168	1
LIGHTING DIMMING CONTROL			
Kroger Item #	**Description**	**Supplier Part ID**	**Qty**
K-0005955	AK2 Enclosure for 1 row of 4 full size Modules Includes Power Supply and 1AK2 Comm Module 13x30x5	AK2I08	1
K-0005947	AK2 Module Type AK2-XM 205A (8AI/8DO)	080Z0010	1
K-0023514	Danfoss AK-XM 103A, Control, Ext. Module, 4AI/4AO	080Z0032	1
K-0037729	AK2 Light Ballast Dimmer Driver board (Boosts signal to drive multiple ballasts)	080Z0270	2
K-0005980	150 VA Wall Mount Control Transformer - 24V	55-168	1
BUILDING CONTROL			
Kroger Item #	**Description**	**Supplier Part ID**	**Qty**
K-0005935	Environmental Control Kit; includes:~AK2-SC255 Building Controller mounted on 22x28x6 enclosure w/ power supply & comm module,8RO, 8RO/8AI combo, outdoor humidistat / photocell / temp sensor, indoor temp sensor, VO2 board.	080Z2590KT	1
K-0005981	AK2-SC255 Box VGA/TP78 / Alarm Logger	080Z2030	1 (IF REQ'D BY DIVISION)
K-0005967	Humidity sensor w/Indoor Temp. Sensor (Old Part Number EMHS3-1)	080Z2171	2
K-0037731	Zone Temperature Sensor (Temp sensor on cover plate - for HVAC room temperature)	ZTP-2	1 PER RTU
K-0022867	Danfoss CO2 Detector	LDCO2	2
K-0046573	AKS 21W Boiler Temp Probe (fits well with 1/2 NPT)	084N2032	1
K-0052690	AKA 222 Modbuss repeater	084B2240	3 TYP. (CASE CONTROL ONLY. NEEDED IF MORE THAN 32 CASE CONTROLLERS ON A COMM LOOP.)
K-0005978	No Sweat unit - 16 circuits	C20125416	2 (NOT NEEDED W/ CASE CONTROLS)
K-0005963	Box Temperature Probe Assembly	BXP2	1 PER BOX (NOT NEEDED W/ CASE CONTROLS)
K-0007856	DANFOSS only: Misc. Controls Equipment (per quote); Note: Quote No. must appear on PO.	PER QUOTE	USE FOR DANFOSS COMMISSIONING (CASE CONTROL STORES ONLY)

2 TAKE-OFF SHEET

SCALE: NONE

KEY NOTE	DESCRIPTION	WIRE TYPE ALL WIRING - PLENUM RATED
1	W.A.N. CONNECTION	BELDEN #1700A #24-8 CATEGORY-5E CABLE OR APPROVED EQUAL
2	ECHELON NETWORK	WINDY CITY #105500-S #22-2 UNSHEILDED, TWISTED CABLE OR APPOVED EQUAL
3	ANALOG / DIGITAL INPUT & OUTPUT / MODBUS COMM	BELDEN #82760 #18-2 SHIELDED CABLE OR APPROVED EQUAL
4	DEFROST TERMINATION SENSOR	BELDEN #82760 #18-2 SHIELDED CABLE OR APPROVED EQUAL
5	RELATIVE HUMIDITY/TEMP SENSOR	BELDEN #82418 #18-4 SHIELDED CABLE OR APPROVED EQUAL
6	LIGHT LEVEL SENSOR / CO2 SENSOR	BELDEN #82418 #18-4 SHIELDED CABLE OR APPROVED EQUAL
7	LIGHTING CONTROL	#14 TWISTED PAIR PER LIGHTING CONTACTOR
8	REFRIGERATION SOLENOID VALVE	#14 TWISTED PAIR
9	HVAC STAGING CONTROL	2-#16-10 MULTI-CONDUCTOR CABLE
10	UNIT HEATER CONTROL	#14 TWISTED PAIR
11	LINE VOLTAGE IN CONDUIT	PER NEC & MANUFACTURE'S GUIDLINES
12	0 - 10V SIGNAL	BELDEN #82760 #18-2 SHIELDED CABLE OR APPROVED EQUAL
13	DRIVE HEALTHY	BELDEN #82760 #18-2 SHIELDED CABLE OR APPROVED EQUAL
14	DRIVE ENABLE	BELDEN #82418 #18-4 SHIELDED CABLE OR APPROVED EQUAL
15	REFRIGERATION TRANSDUCER	BELDEN #82418 #18-4 SHIELDED CABLE OR APPROVED EQUAL

3 ENERGY MANAGEMENT WIRING SCHEDULE

SCALE: NONE

5

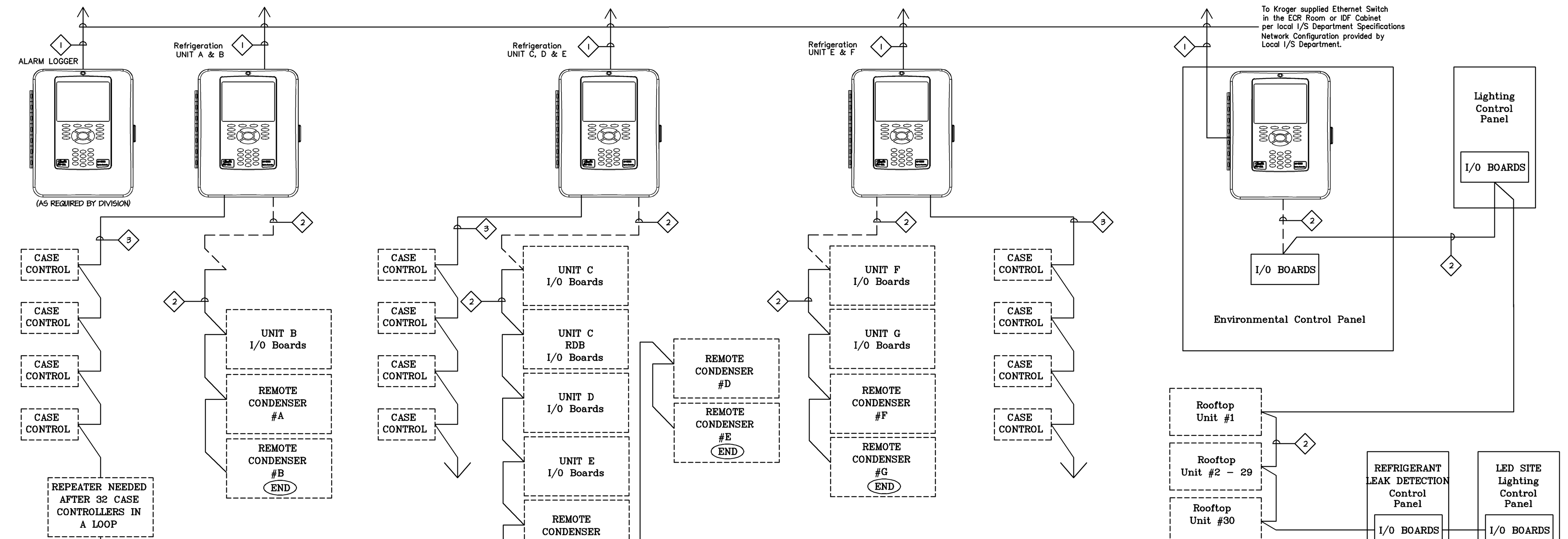
SCALE: NONE

SYMBOL	DESCRIPTION
[hexagon]	REFRIGERATION CIRCUIT DESIGNATION
[triangle]	DEFROST TERMINATION THERMOSTAT
[diamond]	WIRING KEY NOTE SYMBOL
P	ANALOG TEMPERATURE SENSOR
S	ANALOG ZONE TEMPERATURE SENSOR (HVAC)
RH S	ANALOG TEMPERATUE / RELATIVE HUMIDITY SENSOR
LLS	INDOOR LIGHT LEVEL SENSOR
A RH LLS	AMBIENT TEMPERATURE / OUTSIDE HUMIDITY / OUTDOOR LIGHT LEVEL
LDF	REFRIGERANT LEAK DETECTION FILTER DEVICE
PM	PHASE MONITOR
SD	SMOKE DETECTOR
J	CLEAN POWER FIELD INSTALLED BY EC
C	CO2 SENSOR
T	REFRIGERANT PRESSURE TRANSDUCER

SYMBOL	DESCRIPTION
DA	DOOR ALARM
ITS	IMMERSABLE TEMPERATURE SENSOR
2S	(2) INTERNAL RTU MIXED AIR TEMPERATURE SENSORS
F	AIR FLOW / SAIL PROOFING SWITCH
IC	(1) COMPRESSOR PROOF
2C	(2) COMPRESSOR PROOFS
SS	SUCTION STOP SOLENOID
EPR	EVAPORATOR PRESSURE REGULATOR
BP	BOX TEMPERATURE PROBE
MA	MIXED AIR TEMP SENSOR
MI	MOMENTARY OVER RIDE BUTTON
HS	HORN / STROBE UNIT
CC1	CASE CONTROLLER W/ ELECTRIC DEFROST
CC2	CASE CONTROLLER
AKV	ELECTRONIC EXPANSION VALVE

6 GENERAL SYMBOLS

SCALE: NONE



NOTE:
1. CONTRACTOR TO INSTALL AND TERMINATE ECHELON HOST NETWORK. HOST NETWORK SHALL BE DAISY-CHAINED AND TERMINATED AT MODULE END.

4 I/O NETWORK DETAIL

SCALE: NONE

1. THE CONTROLS INSTALLER SHALL BE RESPONSIBLE FOR SUPERVISING THE COMPLETE INSTALLATION OF THE ENERGY MANAGEMENT SYSTEM (EMS). THIS SHALL INCLUDE, BUT NOT BE LIMITED TO THE START-UP, PUNCHDOWN AND PROGRAMMING ADJUSTMENT OF THE ENTIRE DANFOSS CONTROL SYSTEM, INCLUDING REFRIGERATION, HVAC AND LIGHTING CONTROL.
2. THE CONTROLS INSTALLER SHALL PROVIDE ALL COORDINATION BETWEEN THE VARIOUS TRADES, INCLUDING REFRIGERATION, HVAC AND ELECTRICAL TO ENSURE THAT ALL EQUIPMENT IS PROPERLY CONTROLLED AND THAT ALL CONTROL POINTS HAVE BEEN ACCOMMODATED. THIS SHALL INCLUDE VERIFYING ALL HVAC EQUIPMENT TO BE CONTROLLED, VERIFYING ALL STAGES OF HEATING, COOLING, HEAT RECLAIM, TWO SPEED FANS, ETC. AND ENSURING THAT ADEQUATE SENSORS HAVE BEEN SUPPLIED TO ENABLE PROPER CONTROL OF SAME.
3. UPON COMPLETION OF THE EMS INSTALLATION, THE CONTROLS INSTALLER SHALL PROVIDE ACCURATE AND COMPLETE AS-BUILT DOCUMENTATION TO THE OWNER AND THE ENGINEER. THIS DOCUMENTATION MUST INCLUDE AN 8 1/2" x 11" PLAN INDICATING THE LOCATIONS OF ALL OF THE PROBES, SENSORS, RELAYS, REMOTE I/O BOARDS, CONTROLLERS AND REFRIGERANT LEAK SENSORS FOR THE ENTIRE EMS INSTALLATION INCLUDING REFRIGERATION, HVAC AND LIGHTING. THE EMS-C SHALL ALSO FURNISH AND INSTALL AN 8 1/2" x 11" DRAWING SHOWING THE LOCATIONS OF ALL THE REFRIGERATION CIRCUITS. THIS DRAWING SHALL BE MOUNTED ADJACENT TO THE CONTROL PANEL. FURTHER, THIS DOCUMENT SHALL INCLUDE A COMPLETE PRINTOUT SHOWING TERMINATION POINTS, BOARD LAYOUTS AND INITIAL CONTROL SET POINTS FOR REFRIGERATION, HVAC AND LIGHTING CONTROL.
4. ONCE THE NEW CONTROL SYSTEM HAS BEEN INSTALLED AND THE HVAC SYSTEMS ARE READY TO BE BROUGHT ON LINE, THE HVAC-C MUST PROVIDE THE NECESSARY SUPERVISION FOR STARTUP OF THE CONTROL SYSTEM AND COORDINATE START-UP WITH CONTROLS INSTALLER ON SITE. THE HVAC-C MUST ENSURE THAT ALL THE HVAC SYSTEMS ARE OPERATING CORRECTLY AND PROVIDE ANY FINE TUNING OF THE SYSTEM THAT IS REQUIRED.
5. THIS DRAWING IS DIAGRAMMATIC IN NATURE AND IS INTENDED TO CONVEY INSTALLATION REQUIREMENTS REGARDING THE ENERGY MANAGEMENT CONTROL SYSTEM. THIS DRAWING IS PICTORIALLY DRAWN FOR CLARIFICATION PURPOSES ONLY, DO NOT SCALE. REFER TO RESPONSIBILITY CHARTS FOR FINAL EQUIPMENT AND INSTALLATION REQUIREMENTS.
6. REFRIGERATION CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ENERGY MANAGEMENT ISSUES REGARDING REFRIGERATED CASES, EVAPORATOR COILS, REFRIGERATION CONDENSERS, PREP ROOM REFRIGERATION, COMPRESSOR RACKS AND HOT WATER RECLAIM. IT SHALL BE THE RESPONSIBILITY OF THE REFRIGERATION CONTRACTOR TO ENSURE A FULLY OPERATIONAL SYSTEM. REFER TO DETAIL #2 THIS SHEET FOR MORE INFORMATION REGARDING CONTRACTOR RESPONSIBILITIES.
7. REFER TO REFRIGERATION LEGENDS FOR INFORMATION REGARDING FIXTURE, WALK-IN COOLER/FREEZERS, EVAPORATORS, CONDENSERS AND RECLAIM REQUIREMENTS.
8. REFER TO DANFOSS INSTRUCTION MANUALS FOR INFORMATION REGARDING CONTROL COMPONENTS (I.E. INPUT / OUTPUT BOARDS, ELECTRICAL REQUIREMENTS, ETC.)

- FOR REFERENCE ONLY -

CONSTRUCTION GUIDELINES

THESE DRAWINGS ARE GUIDELINES FOR THE TYPICAL CONDITIONS AND DETAILS NEEDED TO INSTALL THE ENERGY MANAGEMENT SYSTEM. REFER TO EM-2 FOR TERMINATION PLAN AND STORE SPECIFIC LAYOUT. ALL WORK REQUIRED TO INSTALL, PROGRAM, CONNECT AND START THE ENERGY MANAGEMENT SYSTEM SHALL BE INCLUDED UNDER THE GENERAL CONTRACTORS SCOPE OF SERVICES, SEE RESPONSIBILITIES MATRIX SHEET EM-1. KROGER SERVICE TECHNICIANS WILL BE AVAILABLE TO CONSULT WITH THE ENERGY MANAGEMENT SYSTEM CONTRACTOR FOR SYSTEM PROGRAM SEQUENCING QUESTIONS AND PREFERENCES, BUT THE SET UP AND WORK WILL BE PROVIDED BY THE ENERGY MANAGEMENT SYSTEM CONTRACTOR.

7 ENERGY MANAGEMENT NOTES

SCALE: NONE

NOTE:
THIS DRAWING IS INTENDED ONLY TO SHOW THE REQUIREMENTS OF THE KROGER CO. THE DESIGN OF THE BUILDING TO CONFORM TO ALL APPLICABLE LAWS, CODES, REGULATIONS, ORDINANCES AND APPROVAL OF THE INSPECTION AUTHORITIES HAVING JURISDICTION IS THE RESPONSIBILITY OF THE ARCHITECT EMPLOYED BY THE OWNER.

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NEW STORE

CURRENT PLAN DATE: 5/1/2015
ORIGINAL PLAN DATE: X
DRAWN: MAD
CHECKED:
REVISIONS:
STANDARD PLOTTED SCALE:

BUILDING STATS:	
TOTAL SHELVING	
SALES AREA % OF GROSS BUILDING	
BASE STORE	
MEZZANINE	
DOCK / UTILITY	

ENERGY MANAGEMENT CASE CONTROLS

SHEET: EM-1A

CAD FILE: