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ENERGY MANAGEMENT LEGEND				
(APPLIES ONLY FOR THIS SHEET) (NOT ALL SYMBOLS ARE USED)				
SYMBOL	DESCRIPTION	NOTE	CABLE/CONDUCTORS	INSTALLATION RESPONSIBILITY
[BCC]	DEFROST CONDUIT	PROVIDE OUTLET BOX AT CASE. PROVIDE WIRING FROM CASE TO RESPECTIVE RETROREGISTRATION UNIT "MC" PANEL (1 OR 3 PHASE AS SCHEDULED). SEE DEFROST WIRING SCHEDULE. PROVIDE WIRING IN 1" CONDUIT FOR WALK-IN COOLERS / FREEZERS AND ALL OTHER APPLICATIONS. IN ADDITION, PROVIDE 1" CONDUIT FOR RECLAIM UNITS. RECLAIM UNITS TO BE WIRED IN SERIES PER RETROREGISTRATION CIRCUIT WITH A SINGLE HOME RUN TO "MC" PER CIRCUIT.	SEE RETROREGISTRATION WIRING SCHEDULE ON THIS SHEET.	CONDUIT: BEC WIRE: ITC
[BDF]	BRANCH DEFROST CONDUIT	PROVIDE OUTLET BOX AT CASE. PROVIDE WIRING FROM CASE TO RESPECTIVE (1 OR 3) PHASE DEFROST CONDUIT FROM PER RED-13 (WHERE APPLICABLE), OR DIRECTLY TO RETROREGISTRATION UNIT UNIT. SEE DEFROST WIRING SCHEDULE. PROVIDE WIRING IN 1" CONDUIT FOR ALL OTHER APPLICATIONS. IN ADDITION, PROVIDE 1" CONDUIT FOR RECLAIM UNITS. RECLAIM UNITS TO BE WIRED IN SERIES PER RETROREGISTRATION CIRCUIT WITH A SINGLE HOME RUN TO "MC" PER CIRCUIT.	SEE RETROREGISTRATION WIRING SCHEDULE ON THIS SHEET.	CONDUIT: BEC WIRE: ITC
[E7]	ZERO COOLING COIL FAN	PROVIDE POWER WIRING IN 1" EMT CONDUIT FROM RESPECTIVE "MC" PANEL TO ZERO COIL FAN IN WALK COOLER AND EACH WALK-IN FREEZER, AND FROM FIRST FAN TO OTHER FANS AS / IF APPLICABLE. SEE 208V COOLING COIL FAN WIRING SCHEDULE.	SEE RETROREGISTRATION WIRING SCHEDULE ON THIS SHEET.	CONDUIT: BEC WIRE: BEC
[E8]	SUCTION STOP SOLYNOID	PROVIDE OUTLET BOX AT CASE. PROVIDE CABLE IN 1" CONDUIT FROM SOLYNOID TO RESPECTIVE "MC" CONTROL PANEL. SOLYNOID SHALL BE FURNISHED AND INSTALLED BY RETROREGISTRATION CONTRACTOR.	SEE SOLYNOID WIRING SCHEDULE ON THIS SHEET.	CONDUIT: BEC WIRE: BEC
[E9]	EVAPORATOR PRESSURE REGULATOR	PROVIDE OUTLET BOX AT CASE. PROVIDE CABLE IN 1" CONDUIT FROM EPR TO RESPECTIVE "MC" CONTROL PANEL. EPR SHALL BE FURNISHED AND INSTALLED BY RETROREGISTRATION CONTRACTOR.	#14 TWISTED PWR (PLUMBN RATED IF APPROX.)	CONDUIT: BEC WIRE: BEC
[E10]	DOOR SENSOR	PROVIDE OUTLET BOX AT COOLER / FREEZER DOOR AS SPECIFIED BY RETROREGISTRATION CONTRACTOR. PROVIDE CABLE IN 1" EMT CONDUIT FROM SENSOR TO RESPECTIVE "MC" PANEL. SENSOR SHALL BE FURNISHED AND INSTALLED BY RETROREGISTRATION CONTRACTOR.	BELDEN #8740 #18-2 SHIELD'D CABLE OR APPROX. EQUAL (PLUMBN RATED IF APPROX.)	CONDUIT: BEC WIRE: ITC
[E11]	UNDERFLOOR HEATING CABLES	PROVIDE SELF-REGULATING HEATING CABLE (WITH CONDUIT STUB UPS) BELOW FREEZER FLOOR AS INDICATED ON DETAIL RED-17 ON E3-SERIES DRAWINGS.	SEE DETAIL RED-17 ON E3-SERIES DRAWINGS.	CONDUIT: BEC WIRE: BEC
[E12]	TEMPERATURE SENSOR (DEFROST/REHEATING)	PROVIDE OUTLET BOX AT CASE. PROVIDE CABLE IN 1" CONDUIT FROM SENSOR TO RESPECTIVE "MC" CONTROL PANEL. SENSOR SHALL BE FURNISHED AND INSTALLED BY RETROREGISTRATION CONTRACTOR.	BELDEN #8740 #18-2 SHIELD'D CABLE OR APPROX. EQUAL (PLUMBN RATED IF APPROX.)	CONDUIT: BEC WIRE: ITC
[E13]	DEFROST THERMOSTAT	PROVIDE OUTLET BOX AT CASE. PROVIDE CABLE IN 1" CONDUIT FROM SENSOR TO RESPECTIVE "MC" CONTROL PANEL. SENSOR SHALL BE FURNISHED AND INSTALLED BY RETROREGISTRATION CONTRACTOR.	BELDEN #8740 #18-2 SHIELD'D CABLE OR APPROX. EQUAL (PLUMBN RATED IF APPROX.)	CONDUIT: BEC WIRE: ITC
[E14]	RETROREGISTRATION CONTROL PANEL	PROVIDE CABLE IN 1" EMT CONDUIT FROM CONTROL PANEL TO CONTROL PANEL USING A LOOP CONFIGURATION (SEE DETAIL). CONTROL PANELS SHALL BE FURNISHED AND INSTALLED BY RETROREGISTRATION CONTRACTOR.	BELDEN #8740 #18-2 SHIELD'D CABLE OR APPROX. EQUAL (PLUMBN RATED IF APPROX.)	CONDUIT: BEC WIRE: ITC
[E15]	TEMPERATURE SENSOR (HAC)	PROVIDE OUTLET BOX MOUNTED ON COLUMN AT 7'-6" ABOVE FLOOR. PROVIDE CABLE IN 3/4" EMT CONDUIT FROM SENSOR TO "MC" CONTROL PANEL. SENSOR SHALL BE FURNISHED AND INSTALLED BY MECHANICAL CONTRACTOR. SEE DETAIL RED-18 ON E3-SERIES DRAWINGS.	BELDEN #8740 #18-2 SHIELD'D CABLE OR APPROX. EQUAL (PLUMBN RATED IF APPROX.)	CONDUIT: BEC WIRE: BEC
[E16]	HUMIDITY SENSOR	PROVIDE OUTLET BOX MOUNTED ON COLUMN AT 7'-6" ABOVE FLOOR. PROVIDE CABLE IN 3/4" EMT CONDUIT FROM HUMIDITY SENSOR TO "MC" CONTROL PANEL. HUMIDITY SENSOR SHALL BE FURNISHED AND INSTALLED BY MECHANICAL CONTRACTOR. SEE DETAIL RED-19 ON E3-SERIES DRAWINGS.	BELDEN #8740 #18-2 SHIELD'D CABLE OR APPROX. EQUAL (PLUMBN RATED IF APPROX.)	CONDUIT: BEC WIRE: BEC
[E17]	HEAT SENSOR	PROVIDE OUTLET BOX MOUNTED ON COLUMN AT 7'-6" ABOVE FLOOR. PROVIDE CABLE IN 3/4" EMT CONDUIT FROM HEAT SENSOR TO "MC" CONTROL PANEL. HEAT SENSOR SHALL BE FURNISHED AND INSTALLED BY MECHANICAL CONTRACTOR. SEE DETAIL RED-20 ON E3-SERIES DRAWINGS.	BELDEN #8740 #18-2 SHIELD'D CABLE OR APPROX. EQUAL (PLUMBN RATED IF APPROX.)	CONDUIT: BEC WIRE: BEC
[E18]	TOP UNIT	PROVIDE CABLE IN 3/4" EMT CONDUIT BETWEEN ROOFTOP HVAC UNITS FROM "MC" CONTROL PANEL AS SHOWN.	SEE DETAIL RED-21 FOR APPROX. EQUAL (PLUMBN RATED IF APPROX.)	CONDUIT: BEC WIRE: BEC
[E19]	COMPRESSOR UNIT	PROVIDE CABLE IN 3/4" EMT CONDUIT FROM EACH CONTROLLER TO "MC" CONTROL PANEL AS SHOWN.	SEE DETAIL RED-22 FOR APPROX. EQUAL (PLUMBN RATED IF APPROX.)	CONDUIT: BEC WIRE: BEC
[E20]	UNIT HEATER	PROVIDE CABLE IN 3/4" EMT CONDUIT BETWEEN UNIT HEATERS AND FROM UNIT HEATERS TO "MC" CONTROL PANEL AS SHOWN.	PROVIDE (2)#14 FOR CONTROL RELAY & #14 SHIELD'D TWISTED PWR FOR TEMPERATURE SENSOR. IF UNIT HAS CPC BOARD, PROVIDE #14 SHIELD'D CONDUCTOR IN LIEU OF WIRE.	CONDUIT: BEC WIRE: BEC
[E21]	EXISTING RECLAIM TANK	PROVIDE CABLE IN 3/4" EMT CONDUIT BETWEEN EXISTING HOT WATER RECLAIM TANKS AND FROM TANK(S) TO "MC" CONTROL PANEL AS SHOWN. WIRELESS TEMP SENSOR SHALL BE FURNISHED AND INSTALLED BY RETROREGISTRATION CONTRACTOR.	BELDEN #8740 #18-2 SHIELD'D CABLE OR APPROX. EQUAL (PLUMBN RATED IF APPROX.)	CONDUIT: BEC WIRE: BEC
[E22]	ELECTRIC DUCT HEATER	INSTALL & WIRE 2-Stage THERMOSTAT (FURNISHED BY HVAC CONTRACTOR). CONTRACTOR AND CONTROL POWER TRANSFORMER WILL BE PROVIDED (FACTORY INSTALLED) BY DUCT HEATER MANUFACTURER. SEE POWER PLAN FOR WIRING.	VERIFY IN FIELD.	CONDUIT: BEC WIRE: BEC
[E23]	RECLAIM 3-WAY VALVE	PROVIDE CABLE IN 3/4" EMT CONDUIT BETWEEN 3-WAY VALVE AND "MC" CONTROL PANEL.	REFER TO SPECIFICATION RED-17 FOR CABLES, REQUIREMENTS AND ADDITIONAL INFORMATION.	CONDUIT: BEC WIRE: BEC

VOLTAGE	DISTANCE < 300'-0"	DISTANCE > 300'-0"
208V / SINGLE PHASE	(2) #12 - 1" CONDUIT	(2) #12 - 1" CONDUIT
120V / SINGLE PHASE	(2) #12 - 1" CONDUIT	(2) #12 - 1" CONDUIT
24V / SINGLE PHASE	(2) #12 - 1" CONDUIT	(2) #10 - 1" CONDUIT

LOAD PER COOLER/FREEZER	DISTANCE < 300'-0"	DISTANCE > 300'-0"
UP TO 12 AMPS	(2) #12 - 1" CONDUIT	(2) #10 - 1" CONDUIT
12 TO 18 AMPS	(2) #10 - 1" CONDUIT	(2) #8 - 1" CONDUIT
18 TO 20 AMPS	(2) #8 - 1" CONDUIT	(2) #6 - 1" CONDUIT

GENERAL NOTES

- REFER TO THE E SERIES SHEETS FOR ALL OTHER RELATED SCHEDULES, DETAILS, ETC. RELATING TO THIS PLAN.
- PROVIDE A MINIMUM OF (2) 1" CONDUITS FOR EACH RETROREGISTRATION CIRCUIT, CONSISTING OF (1) CONDUIT FOR LOW VOLTAGE AND (1) FOR LINE VOLTAGE.
- DEFROST WIRING AND SUCTION STOP SOLENOID CABLES MAY BE COMBINED IN THE SAME CONDUIT, ONLY IF OVERALL FILL DOES NOT EXCEED 40% (FIELD VERIFY).
- FURNISH AND INSTALL ALL WIRES AND CABLES. PROVIDE FINAL TERMINATIONS FOR ALL LINE VOLTAGE WIRING UNITS. RETROREGISTRATION CONTRACTOR SHALL MAKE FINAL TERMINATIONS AT BOTH ENDS OF LOW VOLTAGE WIRES / CABLES AND DEFROST WIRING. PROVIDE SUFFICIENT SLACK AT BOTH ENDS TO ALLOW FOR SERVICE LOOPS AND TO FACILITATE PROPER TERMINATIONS. ELECTRICALS INCLUDING RELATED POWER WIRING SHOWN ON OTHER DRAWING SHEETS, PROVIDE ALL REQUIRED TERMINATIONS.
- IF A DISCREPANCY EXISTS BETWEEN THIS DRAWING AND THE SPECIFICATIONS, REFER TO HIGHER PROJECT NUMBER FOR RESOLUTION.
- WHERE APPLICABLE FOR ISLAND TYPE CASE LOCATIONS, INSTALL CONDUIT BELOW SLAB AND PROVIDE OUTLET BOXES SURFACE MOUNTED JUST ABOVE FLOOR SLAB.
- REFER TO EQUIPMENT SCHEDULES ON E3-SERIES DRAWINGS FOR MOUNTING HEIGHTS AND ADDITIONAL INFORMATION. ALSO SEE DETAILS ON SHEET E3-SERIES DRAWINGS WHERE APPLICABLE.
- INSTALL ELECTRICAL OUTLETS FOR RETROREGISTRATION ISLAND CASES IN A STRAIGHT LINE ALIGNED WITH THE HUB DRAWING. COORDINATE WITH PLUMBING DIMENSIONS SHOWN IN ALL DIMENSIONS INDICATED ON PLANS THROUGHOUT. INTERIOR PARTITIONS WHERE THE RETURN AIR SHUNT IS INDICATED AND WHERE THE SALS AREA SIDE OF THE ROOF DECK HIGH PARTITION IS INDICATED, RETURN AIR SHUNT PARTITION.
- COORDINATE THE UNDERFLOOR HEATING RACKS WITH ALL ATTACHED PARTS PRIOR TO START OF WORK.
- PROVIDE 10 FEET OF 1/2" CONDUIT FOR ELECTRICAL CASES SERVED FROM WALL MOUNTED CASES AND 12 FEET FOR ISLAND MOUNTED CASES FOR RETROREGISTRATION CONTRACTOR.
- SMALL MOUNTED CASES WITH INDICATED CASES WITH RETURN AIR FROM ABOVE SHALL BE ACCESSIBLE (WITH ALL WIRING PLUMBN RATED AS / IF APPLICABLE).
- REFER TO THE DIMENSION PLANS FOR GENERAL DIMENSIONAL INFORMATION REGARDING RETROREGISTRATION UNIT ACCESSORIES AND NECESSARY EQUIPMENT.
- DEFROST SYMBOL IS SHOWN ON THE PLAN, BUT THE EQUIPMENT IS NOT LISTED IN THE "DEFROST WIRING SCHEDULE", THEN ROUTE-IN THE CONDUIT AND OUTLET BOX (WITH BLANK PLATE) FOR FUTURE TERMINATION.
- REFER TO RED-11 FOR MOUNTING SPECIFICS (LOCATIONS, HEIGHTS, ETC.) REGARDING RETROREGISTRATION UNIT ACCESSORIES AND NECESSARY EQUIPMENT.
- RETROREGISTRATION PWS SHOWN FOR REFERENCE ONLY. BEC TO INSTALL RETROREGISTRATION TRENCHES FOR ELECTRICAL CONDUIT WHERE OVER POSSIBLE. COORDINATE ALL TRENCHES WITH RETROREGISTRATION CONTRACTOR AND GENERAL CONTRACTOR. BEC IS RESPONSIBLE FOR ANY ADDITIONAL UNDERFLOOR TRENCHES AS REQUIRED BY ELECTRICAL DRAWINGS.
- REFER TO SPECIFICATION 11 41 48 (RETROREGISTRATION CONTROLS INSTALLATION) FOR WORK REQUIREMENTS. WORK REQUIREMENTS ARE DESCRIBED IN THE INSTALLER RESPONSIBILITY MATRIX.
- REFER TO SPECIFICATION 11 41 43 (EQUIPMENT AND EQUIPMENT ELECTRICAL INSTALLATION) FOR ADDITIONAL INSTALLATION REQUIREMENTS.

INSTALLATION GUIDES

- THE EMS-CONTRACTOR SHALL BE RESPONSIBLE FOR SUPPLYING THE COMPLETE INSTALLATION OF THE ENERGY MANAGEMENT SYSTEM (EMS). THIS SHALL INCLUDE, BUT NOT BE LIMITED TO THE START-UP, HANDOVER AND PROGRAMMING ADJUSTMENT OF THE RETROREGISTRATION / BUILDING CONTROL SYSTEM, INCLUDING RETROREGISTRATION, HVAC, AND LIGHTING CONTROL.
- THE EMS-CONTRACTOR SHALL PROVIDE ALL COORDINATION BETWEEN VARIOUS TRADES, INCLUDING RETROREGISTRATION, HVAC, AND ELECTRICAL TO ENSURE THAT ALL EQUIPMENT IS PROPERLY CONTROLLED AND THAT ALL CONTROLS POINTS HAVE BEEN ACCORDINGLY IDENTIFIED. VERIFYING ALL HVAC EQUIPMENT TO BE CONTROLLED, VERIFYING ALL SIZES OF HEATING, COOLING, HEAT RECLAIM, MULTI-SPEED FANS, ETC., AND ENSURING THAT ADEQUATE SENSORS HAVE BEEN SUPPLIED TO ENABLE PROPER CONTROL OF SAME.
- UPON COMPLETION OF THE EMS INSTALLATION, THE EMS-CONTRACTOR 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 CASE CONTROLLERS, PROBES, SENSORS, RELAYS, REMOTE I/O BOARDS AND MODULES, CONTROLLERS, MODEMS, AND RETROREGISTRATION TRENCHES FOR THE ENTIRE EMS INSTALLATION, INCLUDING RETROREGISTRATION, HVAC, AND LIGHTING SYSTEMS. THE BEC / ITC SHALL FURNISH AND INSTALL A 1/2" X 11" DRAWING SHOWING THE LOCATION OF ALL RETROREGISTRATION DISCRETS. THIS DRAWING SHALL BE MOUNTED ADJACENT TO THE CONTROL PANEL.
- ONCE THE NEW CONTROL SYSTEM HAS BEEN INSTALLED AND THE HVAC SYSTEMS ARE READY TO BE BROUGHT ONLINE, THE HVAC CONTRACTOR MUST PROVIDE THE NECESSARY SUPERVISION FOR STARTUP OF THE CONTROL SYSTEM AND COORDINATE STARTUP WITH OWNERS ENGINEER. THE HVAC CONTRACTOR MUST ENSURE THAT ALL THE HVAC SYSTEMS ARE OPERATING CORRECTLY AND PROVIDE ANY TUNE UP OF THE SYSTEM THAT IS REQUIRED.
- THIS DRAWING IS DIAGNOSTIC IN NATURE AND IS INTENDED TO COMPLY WITH INSTALLATION REQUIREMENTS REGARDING THE ENERGY MANAGEMENT CONTROL SYSTEM. THIS DRAWING IS PICTORIALY DRAWN FOR CLARIFICATION PURPOSES ONLY. DO NOT SCALE. THIS DRAWING IS GENERAL AND NOT ALL CONDITIONS SHOWN ARE REQUIRED FOR INSTALLATION. REFER TO RESPONSIBILITY CHART FOR FINAL EQUIPMENT AND INSTALLATION REQUIREMENTS.
- RETROREGISTRATION CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ENERGY MANAGEMENT ISSUES REGARDING RETROREGISTRATION CASES, EVAPORATOR COILS, RETROREGISTRATION CONDENSERS, REEF ROOM RETROREGISTRATION, COMPRESSOR WIRING, AND HOT WATER RECLAIM SYSTEMS. IT SHALL BE THE RESPONSIBILITY OF THE RETROREGISTRATION CONTRACTOR TO ENSURE A FULLY OPERATIONAL SYSTEM. REFER TO DETAIL #2 FOR ADDITIONAL INFORMATION REGARDING CONTRACTOR RESPONSIBILITIES.
- LOW VOLTAGE EMS CONTROL WIRING BY EMS CONTRACTOR. ALL OTHER HIGH VOLTAGE WIRING SHALL BE BY THE GENERAL CONTRACTORS ELECTRICAL CONTRACTOR.
- REFER TO RETROREGISTRATION LEGENDS FOR INFORMATION REGARDING FUTURE, WALK-IN COOLER / FREEZERS, EVAPORATORS, CONDENSERS, AND RECLAIM REQUIREMENTS.

EMS - SCOPE SUMMARY

EXISTING CPC SYSTEM INSTALLED AT THIS FACILITY. CONTRACTOR TO REVIEW EXISTING FRONT END CONTROL SYSTEM AND UPGRADE AS REQUIRED TO MEET KROGER EMS STANDARDS / REQUIREMENTS. ALL HVAC, RETROREGISTRATION, AND LIGHTING SYSTEMS TO BE INTEGRATED INTO CPC SYSTEM INCLUDING ALL EXISTING RETURN FANS, FAN, EXHAUST FANS, MAKE UP AIR UNIT, UNIT HEATERS, AND NEW HVAC EQUIPMENT / FANS.

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Kroger
GENERAL OFFICE
FACILITY ENGINEERING

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PROJECTING: 2019.0125
DATE: 03.18.2019

EMO.1
ENERGY MANAGEMENT
LEGEND AND SCHEDULE

CHECKED: DS DRAWN: VLD