I. **GENERAL CONTRACTOR'S RESPONSIBILITIES:**

- **a.** Read Cylon Retail Solutions (CRS) / Family Dollar (FD) Documentation Package.
- **b.** Review all FD drawings.
- **c.** Confirm CRS Survey Form, pages 12-15 of this document, are completed and EMAILED to CRS National Account Team at Surveys@Cylon.com or FAXED to (855) 224-0879.
- **d.** Schedule remote EMS Commissioning ***24 hours prior*** to the desired commissioning date.
- **e.** At the time of EMS Commissioning Scheduling, confirm CRS Installation Checklist, pages 16-17 of this document, are completed and EMAILED or FAXED to CRS National Account Team at Surveys@Cylon.com or (855) 224-0879.

II. **ELECTRICAL RESPONSIBILITIES:**

Power to all EMS equipment and devices must be OFF while terminations are made.

- **a.** Provide all labor and installation material, as required, for a complete and operational EMS for this FD store location.
- **b.** Receive and store all CRS material in a dry and secure place until the EMS installation is completed.
- **c.** The EMS equipment will be supplied by CRS and installed by an approved FD contractor.
- **d.** Review the entire set of plans, perform a job site survey and inventory the CRS equipment to ensure the proper equipment has been ordered and received for a complete and operational CRS EMS.
- **e.** If any material is missing or additional equipment is required, immediately call CRS at (888) 211-6789 to request an order.
- **f.** Approved Contractor shall verify number of controlled lighting circuits against the design, report discrepancies, which cannot be resolved in the field, to the CRS National Account Support Team at (888) 211-6789 and wait for resolution instructions.
- **g.** Coordinate the EMS installation with the Mechanical Contractor to avoid any interference that may delay progress during construction.
- **h.** Perform all work in accordance with all National, State and Local Codes for this project.
- **i.** All EMS cables are to be installed per National and Local Codes. It is the Electrical Contractor's responsibility to determine if National and Local Codes permit Class 2 cables to be installed exposed within the building structure or if a full conduit system is required.
- **j.** EMT connectors and bushings are to be installed at the top of every conduit sleeve and threaded connector to protect EMS cables from abrasions.
- **k.** All cables are to be clearly and distinctly labeled within one foot of both ends.
- **l.** Furnish and install all required conduit, boxes, wire ways, fittings, straps, hangers and wiring for a complete and operational EMS as required.
- **m.** Furnish and install a dedicated 120 VAC circuit with breaker lock for the EMS Panel.
  - i. Label breaker: DO NOT TURN OFF / EMS
  - ii. Confirm wiring is completed as per this documentation package before applying power. Improper wiring will cause damage to equipment.
- **n.** Mount the EMS Panel adjacent to the electrical panels.
- **o.** Install an Ethernet cable run from the eSC RJ-45 jack located in the EMS Panel to the network switch specified by the FD networking team.
- **p.** Install and terminate the CRS BACnet communication trunk in a daisy chain fashion from the EMS Panel to each of the Thermostat Controls and all other BACnet devices. (see this documentation package for requirements)
- **q.** When applicable, mount the Auxiliary I/O Panel adjacent to the EMS Panel and ensure both panels are connected to the same Earth Ground.
- **r.** When applicable, ensure the Auxiliary I/O panel is connected in series with the other BACnet devices on the BACnet communications trunk.
- **s.** Mount and terminate the Outdoor Sensor Assembly (OSA) on the HVAC unit that resides closest to the EMS Panel. When installing, make sure OSA enclosure is:
  - i. Mounted on a 1" rigid riser with an 'LB' secured to the back of the OSA. (Refer to FD detail as shown on EM-4)
  - ii. Mounted 3 feet above the HVAC unit
  - iii. Mounted facing North, away from the combustion heat blower and condenser fan
  - iv. Weather-proofed
  - v. Mounted with the white PVC sensor pointed downward
  - vi. Positioned to allow the Outdoor Light Sensor exposure to full ambient daylight but is not shadowed or exposed to any artificial illumination
- **t.** When applicable, mount and terminate the CO2 Sensor as per the location specified by the FD drawings and this documentation package.
- **u.** Mount and terminate the Override Button assembly as per the location specified by the FD drawings and this documentation package.
- **v.** When applicable, mount and terminate the Indoor Ambient Light Sensor(s) as per the location specified by the FD drawings and the Special Instructions in this documentation package.
- **w.** Install and wire coil and load sides of lighting contactors for designated lighting loads as required by FD and this documentation package.
- **x.** Furnish and install a 3-pole, 20 amp breaker/disconnect at the Main Distribution Panel (MDP) for each Phase Loss Power Monitor.
- **y.** Terminate wiring as specified in this documentation package.
  - i. Label each breaker/disconnect: DO NOT TURN OFF / PHASE FAILURE
  - ii. Confirm wiring is completed as per this documentation package before applying power. Improper wiring will cause damage to equipment.
- **z.** Verify EMS Controller Input Jumpers are correctly set. For this install:
  - i. Input jumpers 1 – 4, 6 and 8 should be configured as Thermistor Inputs
    T
  - ii. Input jumpers 5 and 7 should be configured as Voltage Inputs
    V
- **aa.** Install and terminate the CRS Modbus communication trunk from the eSC Controller to the Electrical Meter. (Refer to OEM instructions and this documentation package for requirements)
- **bb.** Permanently mount and terminate the Electrical Meter in close proximity to the main utility power feed.
- **cc.** Permanently mount the 3 Current Sensors, one each, around the 3 phases of the main utility feed.
- **dd.** Terminate the 3 Current Sensors to the Energy Meter, correctly maintaining Electrical Phase and Meter Input relationships.
- **ee.** Using the OEM Instructions, configure the EMS Energy Meter for:
  - i. Proper Current Transformer (CT) Ratio - Current Sensor Primary (Ct) = 400 or 600 Amp
  - ii. Nominal Line to Line Voltage - Typically = 480 Vac (Based on Utility Service)
  - iii. Baud Rate = 19200
  - iv. Address = 1
  - v. Voltage Input Mode = True 3 Phase
  - vi. CT Auto Rotation = Auto Rotate
- **ff.** Provide a technician, on site, for an approximate 2-hour remote telephone checkout with CRS.
- **gg.** Coordinate with the Mechanical Contractor to verify HVAC control during the CRS remote telephone checkout.
- **hh.** Upon completion of the installation and prior to scheduling the Remote Commissioning Checkout, the Electrical Contractor will:
  - i. Fill in the forms below and fax them to CRS at (855) 224-0879.
  - ii. Confirm the Mechanical Contractor will be present during the CRS Remote Commissioning Checkout.
  - iii. Contact CRS to schedule a remote checkout at (888) 211-6789.

III. **MECHANICAL RESPONSIBILITIES:**

Power to all EMS equipment and devices must be OFF while terminations are made.

- **a.** Provide labor and installation material, as required, for a complete and operational EMS for this FD store location.
- **b.** Verify number and type of HVAC units against the design, report discrepancies, which cannot be resolved in the field, to the CRS National Account Support Team at (888) 211-6789 and wait for resolution instructions.
- **c.** Perform all work in accordance with all National, State and Local Codes for this project.
- **d.** Mount and terminate the SimpleSTAT module(s) as per the location(s) specified by the FD drawings and this documentation package.
- **e.** Utilizing 18/8 cable between the SimpleSTAT module and HVAC unit.
  - i. Terminate C, R, G, Y1, Y2, W1 and W2 on the HVAC unit for control of fan, cooling and heating.
  - ii. Terminate the communications cables to the SimpleSTAT(s) as shown in this documentation package.
- **f.** Set address on the SimpleSTAT module, as shown in the SimpleSTAT installation instructions. When communications to the EMS is in a failed state, the SimpleSTAT will operate 24/7 as a stand-alone STAT using the following temperature setpoints:
  - i. Default Cooling Setpoint = 72.0 °F
  - ii. Default Heating Setpoint = 68.0 °F
- **g.** Mount and terminate the Remote Space Temperature Sensor(s) as per the location(s) specified by the FD drawings and the Special Instructions in this documentation package.
  - i. In close proximity to the zone return air grille and away from supply air diffusers.
  - ii. Install and secure the Remote Temperature Sensor wire to the Thermostat Controller.
- **h.** Mount the remote Supply Duct Temperature sensor of each HVAC unit:
  - i. The remote Supply Duct Temperature Sensor should be mounted in the HVAC Supply Air Duct on the interior side of the HVAC unit's building penetration.
  - ii. Utilizing 18/2 wire, terminate the supply duct temperature sensor wires to the Thermostat module as shown in this documentation package.
- **i.** Provide Electrical Contractor with roof layout showing location of HVAC Units on the roof.
- **j.** Provide a technician, on site, for an approximate 2-hour remote telephone checkout with CRS.
- **k.** Coordinate with the Electrical Contractor to verify proper HVAC control during the CRS Remote Commissioning Checkout.

IV. **CYLON RETAIL SOLUTIONS RESPONSIBILITIES:**

- **a.** The following services will be provided by CRS:
  - i. Shipping of all contracted CRS components for the job
  - ii. Programming and downloading of CRS equipment and software
  - iii. Provide telephone technical support at (888) 211-6789.
  - iv. Remote system checkout with installing contractor
- **b.** Verification of proper operation of the following items by exercising the controlled load:
  - i. Timed operation of all applicable EMS lighting loads – Interior and Exterior
  - ii. Outside light level control of all applicable EMS lighting loads – Interior and Exterior.
  - iii. Operation of HVAC heating stages, as indoor environment allows.
  - iv. Operation of HVAC cooling stages, as indoor and outdoor environments allow.
  - v. Verification of HVAC unit sensor readings – space and supply temperatures.
- **c.** If any end unit (e.g. lighting, HVAC unit, supply air fan, etc.) cannot be operated for mechanical or electrical reasons, CRS will verify the proper operation of the control devices (e.g. contactors, discrete I/O) leading up to the unit.

DEVICE LEGEND

SYMBOL	DESCRIPTION
SSC	HVAC UNIT CONTROLLER (SIMPLESTAT)
TRC	HVAC UNIT CONTROLLER (TRC)
DTS	DUCT TEMPERATURE SENSOR
STS	SPACE TEMPERATURE SENSOR
OLS	OUTDOOR LIGHT SENSOR
OHS OTS	OUTDOOR TEMPERATURE & RELATIVE HUMIDITY SENSORS
RTS	REMOTE TEMPERATURE SENSOR
CO_2S	INDOOR CO_2 SENSOR
IHS	INDOOR RELATIVE HUMIDITY SENSOR
ILS	INDOOR LIGHT SENSOR
DOOR SENSOR	O/H DOOR SENSOR
DOOR SENSOR	MAN DOOR SENSOR
SID	SECURITY INTERFACE DEVICE
eSC	eBUILDING SYSTEM CONTROLLER
ROS	REMOTE OVERRIDE SWITCH
OCC	OCCUPANCY SENSOR

CABLE LEGEND

KEY	SIZE	TYPE	MFG.	MFG. PART #
10	18/2	SHIELDED PLENUM	WINDY CITY	# 002320-S
12	18/4	SHIELDED PLENUM	WINDY CITY	# 002340-S
14	18/8	NON SHIELDED PLENUM	WINDY CITY	# 002392-S
16	18/10	NON SHIELDED PLENUM	WINDY CITY	# 002393-S
18	24/8	CAT5 E PLENUM	WINDY CITY	# 5556140-S

WIRING LEGEND

- FIELD WIRING
- POSITIVE
- NEGATIVE
- OPTIONAL COMPONENT

Cylon RETAIL SOLUTIONS
25 Sundial Ave - Suite 310 W
Manchester, NH 03103

FAMILY DOLLAR
DRAWING NOTES
(FOR REFERENCE ONLY)

REVISION: 1.00	
DATE: 09/11/18	ECN#: 2304
INITIAL DESIGN	
REVISION: 1.10	
DATE: 09/25/18	ECN#: 2342
CHANGE EM2 LAYOUT	
REVISION:	
DATE:	ECN#:
REVISION:	
DATE:	ECN#:
DRAWN: WPC	ENGINEER: CGP
PART #: 94-339	OPTION: P

ENERGY MANAGEMENT PLAN

EM-1 of 4