SECTION 13810 - ENERGY MANAGEMENT SYSTEM (EMS)

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Owner furnished Equipment for Installation by Contractor: Owner's EMS equipment supplier will furnish EMS equipment as indicated on Drawings and defined in Appendix A – Products and Work By Owner or separate Contractor. The EMS Installer shall be the General Contractor's installation subcontractor and shall receive and install Energy Management System equipment scheduled or shown on the Drawings and described in this Section.
2. Contractor furnished and installed conduit and related fittings, bushings, wire ties, fasteners, bolts, panduit lables, hangers and wire connectors.
3. Making of EMS terminations and installation of cables and conduit as applicable.
4. Proper identification of systems to include labeling Owner furnished EMS equipment.
5. Coordination with Structured Cabling for installation of Ethernet cable.
6. Coordination of Communication with Walmart Support Services for final download of system parameters.
7. Performance of on-site EMS test.
8. Coordination with EMS Supplier for final checkout of Energy Management System.
9. Coordination with Walmart Mechanical Services Department Construction Manager for Start-Up Week (Supercenters and SAM'S only)
10. Warranty of Energy Management System and Components.

B. Related Requirements:
1. Appendix A – Products and Work By Owner or Separate Contractor.
   a. General procedures related to Owner furnished products and transport, handle, store and protect products.
   b. Manufacturers, suppliers, and vendor contacts and product names and numbers related to Owner furnished products.
2. Section 06100 - Rough Carpentry: Installation of 3/4-inch plywood backboard as shown on drawings.
3. Section 07840 – Firestopping.
4. Section 15700 – Heating, Ventilating and Air Conditioning Equipment.
5. Division 16: 120 VAC control wiring.
6. Division 16: Transformers, interface panels, phase loss sensor, and terminate all 120 VAC control wiring for Energy Management.
7. Division 16: 120 VAC Dedicated circuit for power to system and a 480 VAC 3 phase dedicated circuit for phase monitor voltage sensing.

C. Contractor Responsibilities:
1. Provide (furnish and install) conduit and related fittings, bushings, wire ties, fasteners, bolts, panduit labels, hangers and wire connectors.
2. Install Energy Management equipment scheduled or shown on drawings and described in this Section.
3. Coordinate release of Owner furnished equipment with Walmart Mechanical Services Department.
4. Make all terminations to Owner furnished equipment.

1.2 CLOSEOUT SUBMITTAL

A. Energy Management Punch List: Submit completed punch list to Walmart Stores Inc., 2001 SE 10th Street, Bentonville, AR 72712-0550, Attention: Mechanical Services Department Construction Manager, for verification of completion.

B. EMS Start-Up Report: Submit completed report Walmart Stores, Inc., 2001 SE 10th Street, Bentonville, AR 72712-0550, Attention: Mechanical Services Department Construction Manager, for verification of completion.

C. As-Built Drawings:
   1. Provide in the main EDC framed or laminated as-built drawings for Building Automation System communication loop.
   2. Provide near the refrigerated case input controller backboard, framed or laminated as-built drawings of the layout of refrigerated case module communication loop and sensors connected to refrigerated case input controllers.

D. Complete Energy Management Punch List: Send completed punch list to Walmart Stores Inc., 2001 SE 10th Street, Bentonville, AR 72712-0550, Attention: Mechanical Services Department Construction Manager, for verification of completion and copy General Contractor.

E. NOVAR EMS Refrigeration Salvage Form: Submit completed form and equipment to Mechanical Construction Field Manager.

F. NOVAR EMS HVAC Salvage Form: Submit completed form and equipment to Mechanical Construction Field Manager.

1.3 QUALITY ASSURANCE

A. Provide one qualified technician available to handle emergencies connected with Energy Management work from the time job begins until the end of the 90 day warranty.

B. Contractor Qualifications: Use manufacturer approved installers.

1.4 DELIVERY, STORAGE AND HANDLING

A. Section 01600 – Product Requirements: Transport, handle, store, and protect products.

B. Handle, deliver, and store in manufacturer's original packaging, following manufacturer's recommendations.

C. Store in a dry area and in a manner to prevent damage.

D. Equipment shall remain boxed until ready for installation.

E. Notify Owner of equipment received from carrier in damaged conditions and shortages. Obtain verification of damage from carrier’s truck driver.

F. Contractor will be held responsible for back charges from trucking company due to contractor failure to meet the owner’s equipment delivery schedule.

1.5 DEFINITION OF TERMS

A. Work: Complete Installation of equipment and devices in accordance with applicable specifications and as described in the Drawings, Application Sheets, Manufacturer’s legend sheets and instructions, Request for Bids, and Purchase Orders.

B. The Owner's authorized representative is defined as the Walmart Mechanical Services Department Construction Manager.

C. Energy Management contractor shall mean the General Contractor’s, Walmart approved, Subcontractor that is responsible for performing the Energy Management work as specified on the construction documents. Energy Management Contractor shall be responsible for compliance with applicable codes, ordinances, and work permits.

1.6 DRAWINGS AND SPECIFICATIONS

A. The Drawings and Specifications are complimentary. What is required by one shall be as binding as if required by both. Should the Drawings and Specifications be contradictory or should there be any apparent errors, discrepan-

cies, or omissions, or should there be any doubt as to the meaning of either, the Contractor shall refer to the RFI Process.

B. Neither the Contractor nor the Owner shall be responsible for oral instructions.

C. Addenda, corrections, or letters issued during time of bidding shall take precedence over drawings and specifications.

1.7 EXAMINATION OF THE PREMISES

A. The Contractor's bid shall take into consideration all conditions which may affect the work under this contract.

B. Take field measurements and verify field conditions; compare such field measurements and conditions and other information known to the Contractor with the Drawings and Specifications before commencing activities. Errors, inconsistencies or omissions discovered shall be reported through the RFI Process.

1.8 SUPERVISION AND CONSTRUCTION PROCEDURES

A. Contractor shall agree to undertake all Work contained within the Contract and complete the Work according to the approved construction schedule.

B. The Owner's schedule is critical. The Contractor shall be responsible for meeting the schedule. Complete the following items prior to schedule Substantial Completion Date.
1. EMS Equipment installed and working.
2. Communication between all devices and controllers.
3. Sensors tested (refrigeration only).
4. Confirm Ethernet communicating.
5. Ensure the system is free of alarms or the alarms can be justified and documented.

C. Furnish necessary supervision to coordinate activities of all trades to insure complete installation. Report problems or anticipated problems which may impede progress of the project to the Mechanical Services Construction manager.

D. Check new equipment against Walmart Specifications and report discrepancies to Walmart Mechanical Services Department Construction Manager.

1.9 WARRANTY

A. Provide warranty and service on equipment and materials installed. Warranty shall include failures during installation and for 90 days beyond store Grand Opening date. Warranty shall include labor and parts for equipment covered under the specifications. Owner will require EMS Supplier to furnish replacement parts for failures of OEM Parts during installation period and for one year beyond store Grand Opening date. Contractor shall be responsible for obtaining replacement parts from EMS Supplier. Owner will not pay additional cost associated with repair or replacement of materials and parts during the warranty period. Additional cost attributed to equipment failures shall be handled directly with the EMS Supplier.
1. In the event the Contractor fails to respond to emergency calls or fails to perform required maintenance or repairs during a warranty period, the Owner will have the right to have the repair or maintenance performed by another contractor. In this case, the Contractor agrees to pay Owner the involved amount of the services performed plus 15 percent. Maximum response time to emergency calls as follows:
   a. Building Automation System - 8 hours
   b. Refrigeration Control System - 2 hours
2. If the Contractor subcontracts the warranty work, the 90-day warranty responsibility remains with the primary Contractor. The Contractor shall resolve all payments between the two parties. The Owner will not be involved in resolving payment issues. If the Energy Management Contractor fails to respond to warranty calls, Walmart will remove that contractor from the New Store Bid List until such a time when all disputes or claims are settled.

1.10 MANUFACTURER'S WARRANTIES AND INSTRUCTIONS

A. Nothing shall be done by the Contractor which will void any manufacturer's warranty.

1.11 LAWS AND ORDINANCES

A. Comply with laws, ordinances, rules, and regulations bearing on the Work. If the Contractor observes that Drawings or Specifications, or both are at variance therewith, the Contractor shall promptly notify the Owner in writing. If the Contractor, without written notice to the Owner, performs work, which is not in conformance with such laws, ordinances, rules and regulations, Contractor shall bear all cost arising from correction thereof.

B. Compliance with laws, rules, and regulations shall not be used as means of justifying installations or applications of parts assemblies, or methods inferior to those specified.

C. Comply with OSHA regulations. A copy of all appropriate M.S.D.S. sheets shall be on the job at all times.

1.12 INSPECTION OF WORK

A. The Owner shall have access to the Work at all times for purpose of inspection.

B. If specifications, Instructions, Inspection Coordinators, or laws, ordinances, rules, regulations or any public authority require a portion of the work to be tested, approved or inspected, Contractor shall give the Owner timely notice of its readiness for inspection.

1.13 CHANGES IN THE WORK

A. Do not make changes, perform additional work, or pay for additional work unless authorized in writing by the Owner.

1.14 DEDUCTIONS FOR WORK NOT CORRECTED

A. If the Owner deems it expedient to correct work not conforming to the Contract or defective work, an equitable deduction from the contract price will be made.

1.15 CORRECTION OF WORK BEFORE FINAL PAYMENT

A. If the Owner rejects a portion of the work due to failure to conform to the Contract, the Owner will promptly notify the Contractor of such failure.

B. Upon receipt of such notice, replace or remedy (whichever the Owner requires) the rejected work to conform to the Contract.

C. Contractor shall bear all expenses incident to correction of non-conforming work including cost of transportation, removal of non-conforming work, correction of the work, and repairs to work of other contractors necessitated by remedial work.

1.16 PROTECTION

A. Protect all Work from damage until final acceptance by the Owner. Damaged or defective work shall be replaced at Contractor's expense.

B. Contractor shall be responsible for damage caused by Contractor's own forces or by Contractor's subcontractor's forces.

C. Replace damaged work at no expense to the Owner.

1.17 USE OF PREMISES

A. Confine apparatus, storing of materials and operations of workers to limits indicated by the Owner. Do not unreasonably encumber premises with materials.

B. Promptly remove material interfering with work of other contractors, if directed by the Owner.

C. Enforce the Owner's policies regarding signs, advertisements, and smoking.

1.18 TAXES

A. Contractor shall include in his bid, costs of state or local sales or use taxes and federal taxes, charges, or duties of any nature applicable to the work incorporated under this Contract.

1.19 SPECIAL DAYS

A. Keep one qualified technician available to handle emergencies connected with Energy Management work from the time job begins until the end of the 90 day warranty. The Owner reserves the right to have the Contractor replace the technician if the Owner feels the present technician is failing to respond or is unqualified.

1.20 REQUEST FOR INFORMATION SUBMITTAL

A. All Request for Information (RFIs) regarding EMS shall follow the attached copy of the Request for Information Process Flow Chart.

B. Refer to Specification Section 01255 for RFI Information Submittal Process.

PART 2 - PRODUCTS

2.1 ENERGY MANAGEMENT SYSTEM

A. Unless otherwise specified to be furnished by Contractor, Owner’s EMS supplier will furnish energy monitoring and control system components indicated on Drawings and as specified in Appendix A Section 13810.

2.2 MATERIALS (CONTRACTOR FURNISHED AND INSTALLED)

A. Conduit and Accessories: Conduit, and associated fittings and boxes shall conform to requirements of Section 16100. Provide type and size as appropriate for conditions and locations as shown on the drawings and for the following conditions:
   1. Required by local electrical codes.
   2. Cables are installed in a plenum space used for return air.
   3. Cables are installed outside building.
   4. Cables are installed less than 15 feet AFF in stockrooms.
   5. Cables are subject to physical damage.
   6. Cables pass through any firewall.
   7. Cables are installed underground.
   8. Cables are installed in concealed area.
   9. Cables are installed in finished area.
   10. Cables are installed in finished wall.
   11. Cables are installed under refrigerated cases.

B. Current Transducers for retrofits and new construction: Only revenue-grade current transducers will be accepted. For pricing and ordering information contact EMS Supplier

C. For replacement of damaged parts, only controls manufactured by the EMS Supplier will be accepted. For pricing

and ordering information, contact EMS Supplier

2.3 FABRICATIONS (BY CONTRACTOR)

A. The following describes items and/or functions necessary for field installation:
1. Wire stripping and heat shrink and routing wires
2. Junction boxes to mount wall temp sensors
3. Override panel
4. Installation of conduit
5. CO2 sensors
6. Light dimming
7. Communication cable between controllers
8. Mounting of EMS parts
9. Dual-temperature switches

PART 3 - EXECUTION

3.1 RESPONSIBILITY

A. All Part 3 Execution requirements specified below shall be the responsibility of the Contractor.

3.2 INSTALLATION

A. Install EMS components provided in this section in accordance with EMS Supplier installation instructions and make all 24 VAC control terminations required.

B. Address EMS equipment and controllers and mark on equipment label.

C. In portions of installation where conduit is not necessary, tie wrap cables every 36 inches or a minimum distance of the bar joist spacing. Cables shall be supported by the building structure.

D. Provide wire ties for EMS cable. Colors shall be black UV resistant for RTU and sensor mast assembly, white for inside store in open ceilings, and any color in EDC houses and in EMS equipment.

E. Install Energy Management Sensors where shown on drawing or to Owner's specifications to EMS Supplier installation and hardware mounting procedures.

F. Verify proper Application Specific Controllers are installed in equipment in accordance with EMS Supplier installation and hardware mounting procedures.

G. Generic Input/Output Controller (IOC):
1. Ground IOC with #12 green awg wire.
2. IOC legend shall be typed
3. IOC lock down screws shall be tightened

H. Global Network Controller (GNC):
1. Provide a solidly grounded green insulated conductor, minimum size of #12 AWG, from GNC to system ground buss at main distribution board.
2. Mount GNC display 60 to 72 inches from finished floor, at eye level for the average height person.
3. Provide required clearances for GNC Ethernet connection.
4. GNC lock down screw shall be tightened.

I. Cable:
1. Provide communication cable between all network devices.
2. Do not splice EMS cables for EMS components inside or 5 feet or less outside the building.
3. Splices shall be soldered, heat shrinked, and concealed in a junction box.
4. Cables from rack house to condensers shall be in conduit or sealtite.

5. Cables shall be sealed in roof top unit. (Duct seal, caulk, or other type of sealant.)
6. Cable shall have heat shrink at terminating ends. (No tape allowed.)
7. No drooping or excessive sagging cables.
8. No cable shall run though a raw metal edge hole. Use bushings and chase nipples as needed.
9. Fire rated and sheetrock walls that have EMS cables passing through them shall have an EMT pipe sleeve with bushings on the ends. Fire caulk will be provided by others.

J. Outdoor Assembly:
1. Mount outdoor assembly to 1-1/4 inch rigid conduit through roof (provided by others).
2. Install sensor assembly 5 feet above roof and a minimum of ten feet from edge of roof or from HVAC equipment.

K. Conduit:
1. Installation, EMT:
   a. The number of conductors permitted in single tubing shall not exceed the percentage fill listed in NEC
   b. There shall be no more than the equivalent of four-quarter bends (360 degrees total) between pull points.
   c. Bends in the tubing shall be made so that the tubing will not be damaged and the internal diameter of the tubing will not be effectively reduced.
   d. All cut ends of tubing shall be reamed to remove rough edges.
   e. Boxes and fittings shall comply with NEC.
   f. Tubing shall be supported at least every 10 feet and with in 3 feet of junction boxes or devices
2. Installation, Armored Cable:
   a. Type AC cable shall be secured by approved staples, hangers, and straps, as not to damage the cable, at intervals not more than 4 1/2 feet and within 12 inches of junction box or other device
   b. Fittings shall be used at all ends of armored cables and meet NEC specifications.
   c. Bends shall be made so as not to damage cable.
3. Run conduit from zone sensor directly to junction box and use flex conduit into the roof top unit.
4. Run conduit along bar joist for communication loop and clamp securely.
5. Provide panduit in electrical rooms and refrigerated case input/output controller mounting area where necessary

L. Bushings:
1. Provide properly bushed opening for raceways ending as open conduit.
2. Cables shall pass through a bushing into the roof top unit.

M. Nipples: EMS Installer will provide properly sized conduit nipples for energy management system cable sets as indicated on Drawings and for the following conditions:
1. Required by local codes.
2. Cables pass through wall.
3. Cables pass through floor.

N. Boxes: EMS Installer will provide properly sized boxes for open conduit systems.

O. Light Dimming:
1. All light dimming fixtures are to be tied together by conduit, flex, or box 14 gauge wire or larger.
2. Home run to dimming control shall be 14 gauge or larger in conduit or flex.
3. MC cable is permitted for connecting light fixtures together for low voltage control purposes.
4. Separation between lighting power supply wiring and lighting control wiring shall comply with NEC.

3.3 IDENTIFICATION

A. Provide electronic, permanent labels for location of each refrigeration sensor identifying circuit.

B. Label refrigeration sensors at location in cases with electronic, permanent labels.

C. Provide electronic, permanent labels with 3/4 inch nominal size numbers corresponding to associated rooftop unit for zone temperature sensors.

D. Label each wire a minimum of one inch from end, identifying cable.

E. Label breakers for Energy Management System with orange stickers: “DO NOT TURN OFF!”

3.4 CLEAN UP

A. Promptly remove all rubbish or debris resulting from the Work.

B. During the course of the Work, the area in which the Contractor is working shall be kept in an orderly, reasonably clean condition. Keep gang boxes, spools of wire, and boxes off of sales floor. Tools, supplies, etc. shall remain only as long as they are in use. Abide by site cleanliness policies of General Contractor for general construction.

C. Thoroughly clean Work furnished and installed under this Contract, ready for Owner's use.

3.5 START-UP (SUPERCENTERS & SAM'S)

A. Energy Management equipment start-up and documentation of operation shall be in accordance with Walmart Specifications. Final payment will not be made until start-up reports are received and checkout paperwork is turned over to Walmart Energy Management.

B. Provide adequate number of qualified personnel for start-up period. If the Walmart Mechanical Services Department Construction Manager determines that the schedule cannot be met, provide additional startup personnel for completion in that time frame.

C. Fill out the attached checkout paperwork and send to Walmart Energy Management Department.
1. Pre-checkout forms: Walmart Support Installation Form, HVAC Information, Cutler Hammer Module Configurations and Pre-Checkout Verification Form.
2. Checkout forms: Refrigerated Case Sensor Input Verification, Pulse Meter Letter, Phase Loss Information, Operating Information and Manager’s Orientation.

D. Start-up shall include but not limited to the following:
1. Verify all modules are communicating.
2. Verify all terminations are correct.
3. Verify all sensor locations.
4. Verify, icebath, and calibrate to +/- one degree Fahrenheit if needed on all refrigeration sensors.
5. Replace any modules or sensors that are defective.

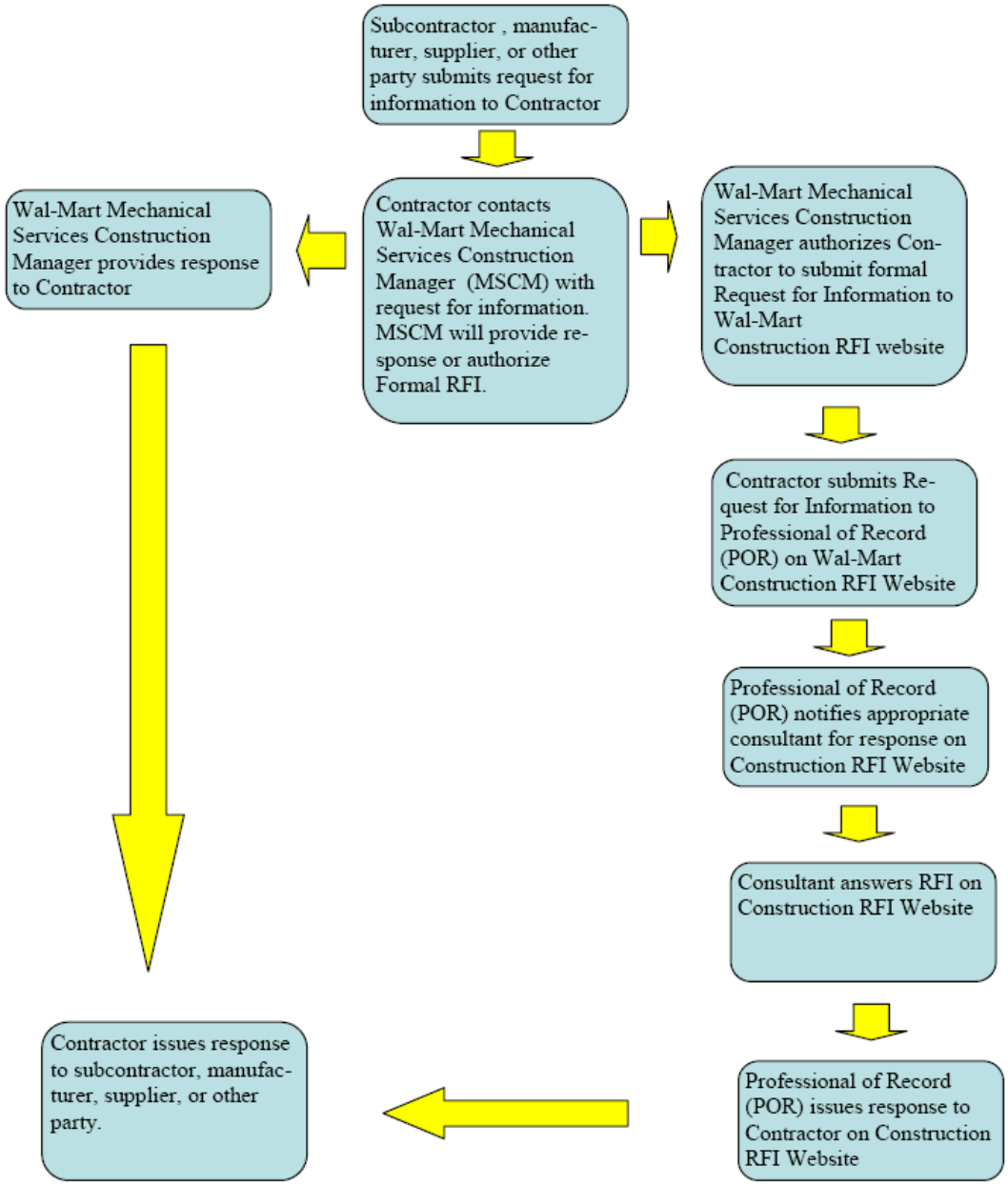
3.6 CHECKOUT

A. Coordinate with Walmart Support for final checkout. The Energy Management Contractor shall not receive final approval until final checkout is complete and deficiencies have been corrected. System documentation will not be complete until Energy Management Contractor has been received final checkout verification number from Walmart Support.

B. Checkout shall include, but is not limited to, the following:
1. Complete Pre-checkout.
2. Complete on-line checkout.
3. Network status.
4. Phase loss monitors.
5. Override verification.
6. Sensor verification.
7. Address verification.
8. Alarm log verification.
9. Transducer verification

10. AHU sensor verification.
11. Light dimming: Dim lights from 100% down to minimum and back up to 100% to demonstrate proper operation.
12. ALS & hi/lo output verification.
13. RTU sensor verification.
14. CO2 sensor verification.
15. RTU damper/actuator verification.

HVAC/REFRIGERATION/EMS
REQUEST FOR INFORMATION
PROCESS FLOW CHART
WAL-MART STORES, SUPERCENTER, SAM'S CLUB,
NEIGHBORHOOD MARKET



WALMART SUPPORT INSTALLATION FORM

Store # _____ Date : _____

Address : _____

City : _____ State : _____ Zip : _____

EMS phone # _____ Store phone # _____

Poss date : _____ G.O. Date : _____

GNC Serial # _____

Ethernet adapter serial # _____

MAC address : _____ Switch: _____ Port # _____

New : _____ Remodel : _____ Expansion : _____ Changeout : _____

EMS Contractor : _____

Contractor 24 hr # _____ Installer : _____

Time zone : _____ Daylight savings time : _____

Lighting control by: Cutler Hammer S.O.B. _____ Contactors: _____

Square-D Powerlink: _____ Cutler Hammer: _____

Number Of Phase Loss Monitors: _____

If store has light dimming ballast, is the negative (gray) control wire from dimming ballast grounded? _____

List any programming changes below

_____

_____

_____

WALMART SUPPORT INSTALLATION FORM (continued)

EMS Phone # ______________________ Main Store # ______________________

Type Of Lighting Fluorescent: ______________ Halide: ______________

Light Dimming Fluorescent: Yes ______ No ______ High / Low: Yes ______ No ______

What Panel And Circuit Breaker Feeds 120vac To GNC Transformer?
Panel: ______________________ Circuit Breaker: ______________________

What Panel And Circuit Breaker Feeds 120vac To IOC Transformer?
IOC Designation: __________ Panel: ____________ Circuit Breaker: __________

What Panel And Circuit Breaker Feeds 120vac To IOC Transformer?
IOC Designation: __________ Panel: ____________ Circuit Breaker: __________

What Panel And Circuit Breaker Feeds 120vac To IOC Transformer?
IOC Designation: __________ Panel: ____________ Circuit Breaker: __________

What Panel And Circuit Breaker Feeds 120vac To IOC Transformer?
IOC Designation: __________ Panel: ____________ Circuit Breaker: __________

What Panel And Circuit Breaker Feeds 120vac To IOC Transformer?
IOC Designation: __________ Panel: ____________ Circuit Breaker: __________

If Store Has Contactors, What Panel And Circuit Feeds 120vac To Contactor?
Panel: ______________________ Circuit Breaker: ______________________

If Store Has Cutler Hammer S.O.B.S, What Panels & Circuit Breakers Feed 120vac To S.O.B.S?

Panel: ______________________ Circuit Breaker: ______________________
Panel: ______________________ Circuit Breaker: ______________________
Panel: ______________________ Circuit Breaker: ______________________
Panel: ______________________ Circuit Breaker: ______________________

Are All EMS Circuit Breakers Marked With Orange EMS Stickers?
Yes ______ If No Explain: ______________________________________

WALMART SUPPORT INSTALLATION FORM (continued)

SUBMIT THIS PAGE FOR FINAL DRAFT

Checkout Number: _____ Date: _____

EMS Contractor: _____

Contractor 24 hr # _____ Installer : _____

Refrigeration start-up: Signature of Walmart Mechanical Services Department Construction Manager:

Date: _____ _____

Attach completed punch list

Make 4 sets of all information and distribute to the following :

1. General Contractor after final checkout (developer projects only)
2. EMS supplier after all signatures are obtained
3. Walmart HVAC technician (leave in package near GNC)
4. Installer's work file

Comments:

_____

_____

_____

Explanations:

_____

_____

_____

PRE-CHECKOUT VERIFICATION FORM

_____ HOA switches in AUTO position for IOCs

_____ Phase Loss Monitors wired and working properly

_____ Sensors reading properly

_____ No Communications Losses or Alarms exist

_____ No Meter failed alarms

_____ Overrides wired and working properly

_____ Exterior lights override in off position

_____ Verify exterior lights are working properly

_____ Verify inside ALS is working properly by covering it and reading GNC display

_____ Verify each CO2 sensor has its own power supply and is working properly

_____ Verify CO2 dampers are working properly

_____ Verify light dimming is working properly

_____ Verify IOC outputs are working properly

_____ Verify phone line is in, number is correct, and functioning

Each of the above lines shall be checked off with the technician's initials.

Without this Verification Form, on-line checkout will not begin.

Signed: _____

EMS Company: _____

Store #: _____ Location: _____

HVAC INFORMATION

Rtu #	Cool Stage	Heat Stage	Gas/ Elec	Dmpr M/Ec	Nos Y/N	Load Title	Mfg	Model #

HVAC INFORMATION

Rtu #	Cool Stage	Heat Stage	Gas/ Elec	Dmpr M/Ec	Nos Y/N	Load Title	Mfg	Model #

CUTLER HAMMER MODULE CONFIGURATIONS

Panel: _____ Module Address: _____
Panel Location: _____ Number Of Circuits: _____

2P	CRK	LOAD	SOB	CRK	LOAD	SOB	2P
	1			2			
	3			4			
	5			6			
	7			8			
	9			10			
	11			12			
	13			14			
	15			16			
	17			18			
	19			20			
	21			22			
	23			24			
	25			26			
	27			28			
	29			30			
	31			32			
	33			34			
	35			36			
	37			38			
	39			40			
	41			42			

Indicate 2 pole breakers by checking “2p” box.

CUTLER HAMMER MODULE CONFIGURATIONS

Panel: _____ Module Address: _____
Panel Location: _____ Number Of Circuits: _____

2P	CRK	LOAD	SOB	CRK	LOAD	SOB	2P
	43			44			
	45			46			
	47			48			
	49			50			
	51			52			
	53			54			
	55			56			
	57			58			
	59			60			
	61			62			
	63			64			
	65			66			
	67			68			
	69			70			
	71			72			
	73			74			
	75			76			
	77			78			
	79			80			
	81			82			
	83			84			

Indicate 2 pole breakers by checking “2p” box.

REFRIGERATED CASE SENSOR INPUT VERIFICATION

Store #	Location:	Walmart Acceptance:
Date:	Tested By:	Company:

Module ID:				Module ID:				Module ID:			
S/N:				S/N:				S/N:			
Location:				Location:				Location:			
Input # Sensor ID	Sensor Input Readings			Input # Sensor ID	Sensor Input Readings			Input # Sensor ID	Sensor Input Readings		
	Pre-Cal	Post-Cal	Startup		Pre-Cal	Post-Cal	Startup		Pre-Cal	Post-Cal	Startup
1)				1)				1)			
2)				2)				2)			
3)				3)				3)			
4)				4)				4)			
5)				5)				5)			
6)				6)				6)			
7)				7)				7)			
8)				8)				8)			
9) Cir #		DT Switch Y / N		9) Cir #		DT Switch Y / N		9) Cir #		DT Switch Y / N	
Notes:				Notes:				Notes:			

Module ID:				Module ID:				Module ID:			
S/N:				S/N:				S/N:			
Location:				Location:				Location:			
Input # Sensor ID	Sensor Input Readings			Input # Sensor ID	Sensor Input Readings			Input # Sensor ID	Sensor Input Readings		
	Pre-Cal	Post-Cal	Startup		Pre-Cal	Post-Cal	Startup		Pre-Cal	Post-Cal	Startup
1)				1)				1)			
2)				2)				2)			
3)				3)				3)			
4)				4)				4)			
5)				5)				5)			
6)				6)				6)			
7)				7)				7)			
8)				8)				8)			
9) Cir #		DT Switch Y / N		9) Cir #		DT Switch Y / N		9) Cir #		DT Switch Y / N	
Notes:				Notes:				Notes:			

Immerse sensor in ice bath. Allow ample time for reading to stabilize. Record reading in Pre-Cal column. If sensor requires adjustment, follow calibration procedures. Record adjusted ready in Post-Cal column. Startup column is for EMS Supplier factory representative spot-check at refrigeration equipment startup.

PULSE METER LETTER

Cutler-Hammer IQ 200 Electrical Distribution System Meter

System Frequency	
Wiring Configuration	
Current Transformer Ratio	
Potential Transformer Ratio	
Demand Window	
KYZ Output Setting	
Energy per Pulse Rate	

Example:

System Frequency	60 Hz
Wiring Configuration	4 wire
Current Transformer Ratio	1200/5
Potential Transformer Ratio	N/A
Demand Window	5 min
KYZ Output Setting	KWh
Energy per Pulse Rate	1

PHASE LOSS INFORMATION

How many phase loss monitors exist in store? _____

Phase loss sensor cable wired between the common and the normally closed contacts?
Yes_____ if no, explain_____

Input to global network controller (GNC) is connected to phase loss input terminals?
Yes_____ if no, explain_____

480 volts to phase loss monitor(s)? Yes _____

What panel and circuit feed 480vac to phase loss monitor(s)?

Panel: _____ Circuit Breaker: _____
Panel: _____ Circuit Breaker: _____
Panel: _____ Circuit Breaker: _____
Panel: _____ Circuit Breaker: _____
Panel: _____ Circuit Breaker: _____

VOLTAGES	PLS #1	PLS #2	PLS #3	PLS #4	PLS #5
A To C					
B To C					
A To B					
A To Ground					
B To Ground					
C To Ground					

Phase Loss Sensor
Under-Voltage: _____ Vac
Over-Voltage: _____ Vac
Delay: _____ Seconds

Lighting information: Include copy of appropriate electrical drawing(s) indicating type of lighting control used, loads and their power circuits. (Use the one line drawing for the contactors, IFP(s), LCU(s) or Cutler Hammer-1000(s) from electrical drawings in plans.)

OPERATING INFORMATION

Communications established with Walmart support: How many phase loss.
Yes_____ if no, explain_____

Each EMS cable is labeled and run without splice. (Include rooftop map from EM1 drawings showing any changes – use red ink on original.)
Yes_____ if no, explain_____

System cables meet material specifications.
Yes_____ if no, explain_____

Outdoor sensor assembly mounted per plans and facing north.
Yes_____ if no, explain_____

All system wiring is neatly tie-wrapped and not exposed to the elements.
Yes_____ if no, explain_____

Global network controller (GNC) batter jumper installed in proper position.
Yes_____ if no, explain_____

Ethernet communication has been established.
Yes_____ if no, explain_____

Activation of HOA switch to each position (off, on, auto) cause all loads to turn off or on according to the white label attached to the transition board of the input/output controller (IOC).
Yes_____ if no, explain_____

Demonstrate battery backup works by lifting global network controller (GNC) from its power supply then replacing it.
Yes_____ if no, explain_____

Demand pulse generator (DPG – demand meter) is functioning and global network controller (GNC) reads correct kw usage as calculated using formula on the pulse meter.
Yes_____ if no, explain_____

NOVAR EMS REFRIGERATION SALVAGE FORM

Novar Equipment and Counts - Refrigeration		
Once verified send copy to bethany.castor@Walmart.com		
Novar Parts	Quantity	Any Noticeable Defects
RC		
RC2xe		
AOM		
COM		
RIM		
CCM		
ROM		
CIM		
CIM2		
8IM		
CMS		
Case Controller's		
Case Controller Power module		
Tranformers		
Sensors		

Store Number

Date

EMS Contractor

NOVAR EMS HVAC SALVAGE FORM

Novar Equipment and Counts - HVAC		
Once verified send copy to bethany.castor@Walmart.com		
Novar Parts	Quantity	Any Noticeable Defects
EP2		
LingoXE		
ETM		
LSE		
IOM/2		
IOM1010		
MINio		
LSE		
NCH-1000		
NSD/M1		
UCM		
Hawki		
VAV-4040		
Eclipse		

Store Number

Date

EMS Contractor

END OF SECTION