

Energy Conservation Measure Package

ECHCS Denver VA



FMS

VA ECHCS 1055 Clermont Street

(Feb 22, 2013) Basic

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I. OVERVIEW OF TASKS

This statement of work covers five energy conservation measures. Task 1 is the fabrication and installation of thermal blankets in Building 8 of the ECHCS Denver Medical Center. Task 2 is the installation of one hundred room occupancy motion sensors. Task 3 is the installation of 80 high output LED low bay lighting fixtures in a parking garage. Task 4 is installing eleven high performance electric motors, belts and sheaves. Task 5 is a steam trap survey and replacement of approximately 30% of current steam traps.

Task 1- Building 8 Insulation

I.A.1 DESCRIPTION OF SERVICES.

A. SCOPE

1. The work covered by this thermal blanket fabrication consists of furnishing all labor, equipment, materials and accessories, and performing all operations required, for the correct fabrication and installation of custom thermal insulation blankets and thermal steam pipe insulation. This applies to the following equipment and piping systems, in accordance with applicable project specifications and drawings, subject to the terms and conditions of the contract. The contractor shall perform to the standards in the contract as well as all local, state, and federal regulations. There is no suspected ACM in this facility. An updated asbestos evaluation was completed on this building in the areas where work has been identified, however if there are suspect areas that may be uncovered during construction the contractor shall notify COTR and Contracting officer and identify potential issues and we will determined course of next action.

B. REFERENCES

1. Thermal insulation materials shall meet the property requirements of one or more of the following specifications as applicable to the specific product or end use:

a) American Society for Testing of Materials Specifications:

(1) ASTM C 547, "Standard Specification for Mineral Fiber Pipe Insulation"

(2) CAN/CGSB-51.9-92, "Mineral Fiber Thermal Insulation for Piping and Round Ducting"

(3) ASTM C 585, "Standard Practice for Inner and Outer Diameters of Rigid Thermal Insulation for Nominal Sizes of Pipe and Tubing (NPS System)"

C. DEFINITIONS

1. The term "mineral fiber" as defined by the above specifications includes fibers manufactured of glass, rock, or slag processed from a molten state, with or without binder.

<http://www.millerinsulation.com/contactus.aspx>

D. SYSTEM PERFORMANCE

1. Insulation materials furnished should meet the minimum thickness requirements of National Voluntary Consensus Standard 90.1 (1999), "Energy Efficient Design of New Buildings," of the American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE). However, if other factors such as condensation control or personnel protection are to be considered, the selection of the thickness of insulation should satisfy the controlling factor.

2. Insulation materials furnished and installed hereunder shall meet the fire hazard requirements of applicable building codes when tested in composite form per one of the following nominally equivalent test methods:

a) American Society for Testing of Materials ASTM E 84

b) Underwriters' Laboratories, Inc. UL 723, CAN/ULC-S102-M88

c) National Fire Protection Association NFPA 255

I.A.2 SYSTEM DESCRIPTION

A. The contractor will provide the services listed herein and installation of the following approx 50 L/F replacement of steam/hot water pipe insulation, to match existing with aluminum metal clad exterior surface. Approx 10 custom made removable High temperature thermal steam blankets small to medium size for various steam fittings, valves, steam traps and all required identification marking to include the following:

1. (10) L/F 4/6" glass closed cell insulation 2" wall w/labels
2. (10) EA Boiler room Misc size, shapes, valves fittings small to Medium sizes. To be removable high Temperature thermal Blankets, with Velcro attachments. See example photographs in Appendix A.
3. (1) Condenser stand pipe 2nd floor Mezz.
4. (3) Boiler control panel insulation blanket. (Quote as option)

B. Contractor to provide line item pricing on above thermal insulation and custom blankets. Note that each custom blanket may be slightly different in size and shape but overall cost should be close in each general type of custom blankets. Steam line blankets proposals will provide per foot and elbows separately.

C. Contractor to walk area with COTR to define the exact blanket location and will use the provided Thermal Study to define blanket parameters.

I.A.3 INSTALLATION

A. General

1. Install all insulation materials and accessories in accordance with manufacturer's published instructions and recognized industry practices to ensure that it will serve its intended purpose.

2. Install insulation on piping subsequent to installation of heat tracing, painting, and acceptance tests as required.
3. Install all custom insulation materials with smooth and even surfaces. Insulate each continuous run of piping with full-length units of insulation, with single cut piece to complete run. Do not use cut pieces or scraps abutting each other. Butt insulation joints firmly to ensure complete, tight fit over all piping surfaces.
4. Maintain the integrity of factory-applied vapor/metallic heat barrier jacketing on all pipe insulation, protecting it against puncture, tears or other damage. All staples used on cold pipe insulation shall be coated with suitable sealant to maintain vapor barrier integrity.

1.A.4 QUALITY ASSURANCE AND STANDARDS

- A. All work, material or equipment shall comply with the codes, ordinances and regulations of the local government having jurisdiction, including the regulations of serving utilities and any participating government agencies having jurisdiction.
- B. No requirement of this Statement of Work (SOW), scope and IR thermographic study for bldg 8 and all specifications that apply shall be construed to void any of the provisions of the above standards. The Contractor shall bring any conflicts or changes required to the contract documents in order to obtain VA approval
- C. Final verification will be by IR Thermography by the VA and a comparison to the included IR study for building 8 along with a visual inspection to verify compliance with all requirements.
- D. Insure compliance with all applicable codes. If there are questions or issues, the contractor is to bring these issues to the immediate attention of the ECHCS VA Representative.
- E. The Contractor shall provide Blanket pattern templates/ drawings per Specifications as required. The contractor shall provide a formal submittal

for all layouts and patterns for COTR approval prior to blanket fabrication. The Contractor shall verify all dimensions and clearances prior to commencement of installation and as deemed necessary a fit check of the blanket patterns.

F. The Contractor shall verify all points of connection with the manufacturer's requirements, instructions, or recommendations prior to installation. The actual dimensions, weights, clearance requirements and installation requirements shall be verified and coordinated by the contractor.

G. Hardware acceptance and quality review. All blankets and insulation installation shall be inspected by COTR and approved to verify final installation and operational requirements.

Task 2 - ECHCS Occupancy Sensor Project

The Contractor shall provide up grade to ECHCS to add new Occupancy Sensors.

I.B.1 DESCRIPTION OF SERVICES.

The contractor shall provide all personnel, equipment, tools, materials, vehicles, supervision, and other items and services necessary to fabricate, install, and test this sensor. The contractor shall perform to the standards in the contract as well as all local, state, and federal regulations. It was observed on our survey that numerous clinics, office and conference areas, restrooms and locker rooms, public areas and other lab areas were unoccupied and lighting was on. The Electric Power Research Institute (EPRI estimates that Occupancy controls save considerable energy: Private offices (25%); open offices (18%); conference rooms (35%); and restrooms (40%)

1.B.2 SYSTEM DESCRIPTION

A. The contractor will provide the services listed herein and installation ninty (90) Automatic high output duel technology sensors wall switch and ten (10) ceiling type, incorporating both IR and motion functions of the sensor. Contractor to add 3% to total count for contingency. There may be other applications which may arise as we proceed through the change out which may require the use of other types of applications such as; one wall switch sensor several fixtures, two wall switches multiple fixtures, one ceiling sensor multiple fixtures, multiple ceiling sensors multiple fixtures etc. The chart below provides some guidance in mounting provisions.

Mounting Location	Sensor Technology	Angle of Coverage	Typical Effective Range*	Optimum Mounting Height
Ceiling	US	360°	500-2000 sq.ft.	8-12 ft.

Ceiling	PIR	360°	300-1000 sq.ft.	8-30+ ft.
Ceiling	DT	360°	300-2000 sq.ft.	8-12 ft.
Wall switch	US	180°	275-300 sq.ft.	40-48 in.
Wall Switch	PIR	170-180°	300-1000 sq.ft.	40-48 in.
Corner wide view	PIR/DT	110-120°	To 40 ft.	8-15 ft.
Corner narrow view	PIR	12°	To 130 ft.	8-15 ft.
Corridor	US	360°	To 100 ft.	8-14 ft.
High mount	PIR	12-120°	To 100 ft.	To 30 ft.
High mount corner	DT	110-120°	500-1000 ft.	8-12 ft.
High mount ceiling	DT	360°	500-1000 ft.	8-12 ft.
*Sensitivity to minor motion may be substantially less than noted above, depending on environmental factors.				
PIR = passive infrared, US = ultrasonic, DT = dual-technology				

B. The installation of the Occupancy sensors will include the following:

1. The contractor shall provide all equipment and tools to accomplish the installation of each type of motion sensor, wall mounted, switch or ceiling mounted sensor.
2. The contractor shall provide any final adjustment to the sensor per manufactures direction to suite the environment the sensor is mounted in.
3. Sensor type – Each sensor shall be the dual technology type using ether Hubell, Leviton or equal and shall include as a minimum
 - a) Ultrasonic and passive infrared wall and ceiling sensors
 - b) Continuous self adapting future
 - c) LED walk test indicator
 - d) Quick install connector
 - e) Memory for sensor settings
 - f) Fits standard single-gang box
 - g) Impact resistant lenses
 - h) Photocell with super saver mode
 - i) Dual operating modes – Automatic and manual

j) Title 24 compliant operation

4. All hardware, wiring, disconnects, conduit etc.

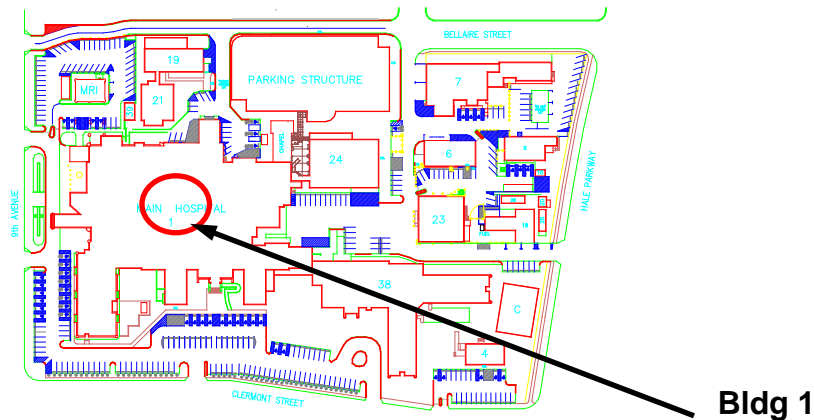
C. Power output and electrical

1. Each unit shall be UL listed class 2, IP66 rated, 60Hz line over a voltage range form 95 volts to 280 volts.
2. Electrical ratings 120VAC:800w incandescent, 1000w fluorescent,
3. 277VAC: 1800w fluorescent
4. These sensors require neutral wire. Depending on the location this may have to be added.
5. All locations will be verified via site visit and walk with COTR prior to work start.

I.B.3 SENSOR INSTALLATION

A. Location - each sensor shall be located to provide the 180 degree sensor view. If the location is a wall switch that is blocked or does not have complete 180 degree view contractor will relocate or change to wall or ceiling mount as necessary to insure the proper sensor operation. These changes will be coordinated with the COTR prior to making the change. All ceiling mounted will be 360 degree. Contractor shall coordinate placement of these sensors w COTR.

B. Building 1 all floors



1. Basement

- a) 5 wall
- 2. First floor
 - a) 30 wall sensors
 - b) 3 ceiling sensors
- 3. Second floor
 - a) 30 wall sensors
 - b) 2 ceiling sensors
- 4. Third floor
 - a) 5 wall sensors
- 5. Fourth floor
 - a) 10 wall sensors
 - b) 3 ceiling sensors
- 6. Fifth floor
 - a) 5 wall sensors
 - b) 1 ceiling sensors
- 7. Seventh floor
 - a) None
- 8. Eighth floor
 - a) None
- 9. Ninth floor
 - a) 5 wall sensors
 - b) 1 ceiling sensor

C. Operator Training – Contractor to provide training for operation, performance and maintenance. This will be accomplished after final system acceptance by COTR project manager.

D. Contract Coverage – The sensor installation will be complete approximately no more than 6 weeks after contract award

I.B.4 QUALITY ASSURANCE AND STANDARDS

A. All work, material or equipment shall comply with the codes, ordinances and regulations of the local government having jurisdiction,

including the regulations of serving utilities and any participating government agencies having jurisdiction.

B. All electrical work shall comply with the latest edition under enforcement of the following codes and standards or other regulations which may apply and Reference VA Master Construction Specifications.

http://vaww.va.gov/facmgt/standard/spec_idx.asp

1. VA PG-18-4 National CAD Standards and Details
2. VA H-18-8 VA Seismic Design Requirements
3. International Building Code (IBC)
4. American National Standards Institute (ANSI)
5. American Society for Testing and Materials (ASTM)
6. Insulated Cable Engineers Association (ICEA)
7. Institute of Electrical and Electronics Engineers (IEEE)
8. Local Code Enforcement Agency Requirements
9. National Electrical Code (NEC)
10. National Electrical Manufacturer's Association (NEMA)
11. Occupational Safety & Health Association (OSHA)
12. National Fire Protection Association (NFPA)
13. Underwriters' Laboratories, Inc. (UL)

C. No requirement of these drawings and specifications shall be construed to void any of the provisions of the above standards. Any conflicts or changes required to the contract documents in order to obtain compliance with applicable codes shall be brought to the immediate attention of the ECHCS VA Representative by the Contractor.

D. The Contractor shall provide CADD drawings per Specifications if required. The Contractor shall verify all dimensions and clearances prior to commencement of installation.

E. The Contractor shall verify all points of connection with the manufacturer's requirements, instructions, or recommendations prior to installation. The actual dimensions, weights, clearance requirements and

installation requirements shall be verified and coordinated by the contractor.

F. The Contractor will be required to follow a VA hot-work permit process if required. See 01-00-00 for details, as well as furnish any and all Personal Protective Equipment (PPE) safety equipment and requirements as required to perform the described tasks.

G. Scheduling --- The contractor shall provide a detailed schedule including all major components for this project from Notice to Proceed (NTP) and include as a minimum in phases:

1. Notice to proceed date
2. Engineering development drawings,
3. Wiring diagrams
4. Submittals, project schedules
5. Progress payment scheduling
6. Phase 1 – Long lead procurement
7. Phase 2 - Installation
8. Phase 3 – Project completion and functional tests and reports.

H. Hardware acceptance and quality review shall be inspected by COTR and approved to verify final installation and operational requirements.

I. Installation including detailed timing and coordination with Contracting Officers Technical Representative (COTR) and Facility Management Services (FMS) defining any electrical outages requires 15 day notice for outage coordination. Replacement will need to be after hours/weekends* as necessary to minimize hospital disruption.

I.B.5 FUNCTIONAL/OPERATIONAL TESTING

Contractor to develop and prepare a detailed Functional and operational test plan that is to be submitted to the COTR for acceptance 15 days prior to final testing.

Task 3 - ECHCS LED Parking Garage Lighting Upgrade

The Contractor shall provide up grade to ECHCS parking garage lighting.

I.C.1 DESCRIPTION OF SERVICES.

The contractor shall provide all personnel, equipment, tools, materials, vehicles, supervision, and other items and services necessary to fabricate, install, and test this integrated lighting. The contractor shall perform to the standards in the contract as well as all local, state, and federal regulations.

I.C.2 SYSTEM DESCRIPTION

A. The contractor will provide the services listed herein and installation of eighty (80) high output LED low bay lighting fixtures.

B. The installation of the LED lighting fixtures will include the following:

1. The contractor shall provide all equipment and tools to accomplish the installation of lighting system
2. The contractor shall provide eighty (80) each LED panel to replace current 175w MH. This will include the mounting accessories to interface with existing pipe mounting system used on the MH lighting. Or contractor to fabricate new fixture mounting hardware.
3. The High output LED to provide a range of 5,500k to 7,000k on the Kelvin temperature scale and provide a minimum of 70,000 hours of continuous operation. The contractors proposal shall provide recommendation on the most affective replacement and energy savings over existing 175 Watt MH lighting components
4. Each LED module shall be protected by a high impact, UV stabilized, and non yellowing acrylic lens that is sealed in place with extruded silicon rubber.
5. All hardware, wiring, disconnects, conduit etc.

C. Power output and electrical

1. Each power supply shall be UL listed class 2, IP66 rated, 60Hz line over a voltage range from 95 volts to 280 volts. Each driver shall have a power factor of greater than 0.91 with an input current of less than 20% Total Harmonic Distortion. Each driver shall include voltage surge protection to withstand high repetition noise transients and comply with FCC Title 47, Subpart B Section 15.
2. All terminal blocks and wiring shall conform to the requirements set forth in Section 13.02 of the ITE publication: Equipment and Material Standards, Chapter 2.
 - a) Warranty – shall consist of a minimum life of 70,000 hours of continuous operation

I.C.3 LED INSTALLATION

- A. Location - each LED light engine will replace an existing 175w MH light, which will be located at the approximate height of the existing MH fixture.
- B. The replacement/installation - will start where Phase I project ended approx on the 2nd floor of the parking garage and continue up until all 80 units have been replaced. There are some MH units that light sensors have been installed on if any of these are encountered the sensors will remain in operation.
- C. Electric meter - An electric meter shall be installed at the parking garage main electrical supply panel. This will be accomplished at least 50 days prior the installation of the light units. The contractor shall track and record data both before and after installation.
 1. System Performance - graphics will be developed to provide full LED performance with trends and graphic displays depicting LED engine **output**.
- D. Operator Training – Contractor to provide training for operation, performance and maintenance. This will be accomplished after final system acceptance by COTR project manager.

E. Contract Coverage – The LED installation will be complete as directed by contracting after contract award.

Parking garage structure lighting project

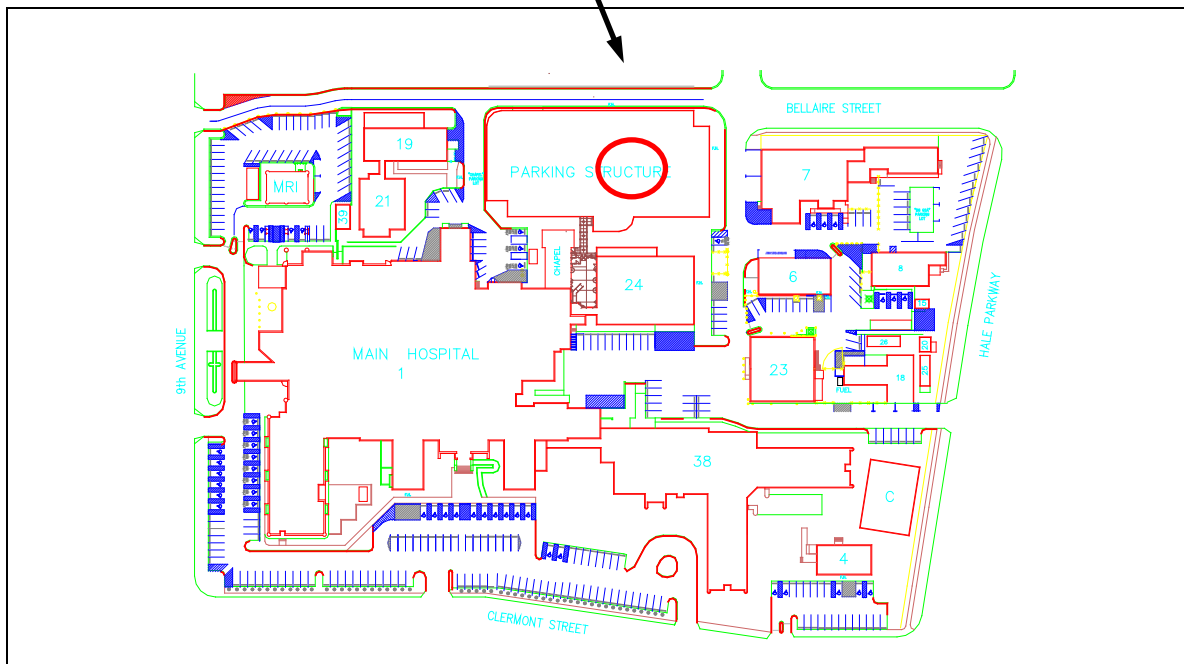


Figure 1. ECHCS Campus layout

I.C.4 QUALITY ASSURANCE AND STANDARDS

A. All work, material or equipment shall comply with the codes, ordinances and regulations of the local government having jurisdiction, including the regulations of serving utilities and any participating government agencies having jurisdiction.

B. All electrical work shall comply with the latest edition under enforcement of the following codes and standards or other regulations which may apply and Reference VA Master Construction Specifications.
http://vaww.va.gov/facmgt/standard/spec_idx.asp

1. VA PG-18-4 National CAD Standards and Details

2. VA H-18-8 VA Seismic Design Requirements
3. International Building Code (IBC)
4. American National Standards Institute (ANSI)
5. American Society for Testing and Materials (ASTM)
6. Insulated Cable Engineers Association (ICEA)
7. Institute of Electrical and Electronics Engineers (IEEE)
8. Local Code Enforcement Agency Requirements
9. National Electrical Code (NEC)
10. National Electrical Manufacturer's Association (NEMA)
11. Occupational Safety & Health Association (OSHA)
12. National Fire Protection Association (NFPA)
13. Underwriters' Laboratories, Inc. (UL)

C. No requirement of these drawings and specifications shall be construed to void any of the provisions of the above standards. Any conflicts or changes required to the contract documents in order to obtain compliance with applicable codes shall be brought to the immediate attention of the ECHCS VA Representative by the Contractor.

D. The Contractor shall provide CADD drawings per Specifications if required. The Contractor shall verify all dimensions and clearances prior to commencement of installation.

E. The Contractor shall verify all points of connection with the manufacturer's requirements, instructions, or recommendations prior to installation. The actual dimensions, weights, clearance requirements and installation requirements shall be verified and coordinated by the contractor.

F. The Contractor shall evaluate current number and location of existing MH lighting and make recommendations based on illumination reading of any potential reduction of light engines LED replacements i.e. west entrance

G. The Contractor will be required to follow a VA hot-work permit process if required. See 01-00-00 for details, as well as furnish any and all

Personal Protective Equipment (PPE) safety equipment and requirements as required to perform the described tasks.

H. Scheduling --- The contractor shall provide a detailed schedule including all major components for this project from Notice to Proceed (NTP) and include as a minimum in phases:

1. Notice to proceed date
2. Engineering development drawings,
3. Wiring diagrams
4. Submittals, project schedules
5. Progress payment scheduling
6. Phase 1 – Long lead procurement
7. Phase 2 - Installation
8. Phase 3 – Project completion and functional tests and reports.

I. Hardware acceptance and quality review shall be inspected by COTR and approved to verify final installation and operational requirements.

J. Installation including detailed timing and coordination with Contracting Officers Technical Representative (COTR) and Facility Management Services (FMS) defining any electrical outages requires 15 day notice for outage coordination. Replacement will need to be after hours/weekends* as necessary to minimize hospital disruption.

I.C.5 FUNCTIONAL/OPERATIONAL TESTING

Contractor to develop and prepare a detailed Functional and operational test plan that is to be submitted to the COTR for acceptance 15 days prior to final testing. Providing calculated savings potential and actual installed savings comparison with charts and graphs to verify results.

Task 4 - ECHCS Electric Motor Replacement

The Contractor shall upgrade ECHCS non EPAC electric motors to premium efficiency electric motors.

I. DESCRIPTION OF SERVICES.

A. The contractor shall provide all personnel, equipment, tools, materials, vehicles, supervision, and other items and services necessary to provide a survey of AHU's listed Below in Figure 1 from 10 -40 hp i.e. (1-10 hp, 3-15 hp, 3-20hp, 3-30hp, 1-40 hp) and evaluate the exact requirements, sizes, shaves and belt arrangements, mounting, frame size, rpm, efficiencies, recommended manufacture, full load amps. The survey will document size, type, voltage, amps, phase, rotation etc. The contractor is to provide new high efficiency premium electric motors. (Baldor or equal American made electric motor, sheaves and belts). The contractor shall install and test per manufactures recommendations. The contractor shall perform to the standards in the contract as well as all local, state, and federal regulations.

II. SYSTEM DESCRIPTION

A. The contractor will provide the services listed herein and installation for eleven (11) high performance electric motors, belts and sheaves. The chart Appendix 2 provides some guidance for motors and location.

1. The contractor shall provide all equipment and tools to accomplish the installation of motor and sheave/belt installation
2. The contractor shall provide any final adjustment and alignment per manufactures direction. And verify final motor, sheave and belt requirement

B. Power output and electrical

1. Each unit shall be UL listed 60Hz line over a voltage range from 230/460 volts.
2. Electrical ratings 3 phase, service factor 1.15, 40 c AMB, J NEMA, A insulation code,
3. Premium efficient motor.

4. All locations will be verified via site visit and walk with COTR prior to work start.

III. SENSOR INSTALLATION

- A. Location – All motor replacements will be in the main ECHCS hospital facility. These provide HVAC to various locations in the hospital including operating room, and critical areas where the installation may require off hours for installation. The contractor shall coordinate placement of these motors with the COTR.
- B. Building 1 all floors
- C. Operator Training – Contractor to provide training for operation, performance and maintenance. This will be accomplished after final system acceptance by COTR project manager.
- D. Contract Coverage – The motor installation will be complete approximately more than 10 weeks after contract award

IV. QUALITY ASSURANCE AND STANDARDS

- A. All work, material or equipment shall comply with the codes, ordinances and regulations of the local government having jurisdiction, including the regulations of serving utilities and any participating government agencies having jurisdiction.
- B. All electrical work shall comply with the latest edition under enforcement of the following codes and standards or other regulations which may apply and Reference VA Master Construction Specifications. http://vaww.va.gov/facmgt/standard/spec_idx.asp
 1. VA PG-18-4 National CAD Standards and Details
 2. VA H-18-8 VA Seismic Design Requirements
 3. International Building Code (IBC)
 4. American National Standards Institute (ANSI)
 5. American Society for Testing and Materials (ASTM)
 6. Insulated Cable Engineers Association (ICEA)
 7. Institute of Electrical and Electronics Engineers (IEEE)
 8. Local Code Enforcement Agency Requirements
 9. National Electrical Code (NEC)
 10. National Electrical Manufacturer's Association (NEMA)

11. Occupational Safety & Health Association (OSHA)

12. National Fire Protection Association (NFPA)

13. Underwriters' Laboratories, Inc. (UL)

C. No requirement of these drawings and specifications shall be construed to void any of the provisions of the above standards. Any conflicts or changes required to the contract documents in order to obtain compliance with applicable codes shall be brought to the immediate attention of the ECHCS VA Representative by the Contractor.

D. The Contractor shall provide CADD drawings per Specifications if required. The Contractor shall verify all dimensions and clearances prior to commencement of installation.

E. The Contractor shall verify all points of connection with the manufacturer's requirements, instructions, or recommendations prior to installation. The actual dimensions, weights, clearance requirements and installation requirements shall be verified and coordinated by the contractor.

F. The Contractor will be required to follow a VA hot-work permit process if required. See 01-00-00 for details, as well as furnish any and all Personal Protective Equipment (PPE) safety equipment and requirements as required to perform the described tasks.

G. Scheduling --- The contractor shall provide a detailed schedule including all major components for this project from Notice to Proceed (NTP) and include as a minimum in phases:

1. Notice to proceed date
2. Engineering development drawings,
3. Wiring diagrams
4. Submittals, project schedules
5. Progress payment scheduling
6. Phase 1 – Long lead procurement
7. Phase 2 - Installation
8. Phase 3 – Project completion and functional tests and reports.

H. Hardware acceptance and quality review shall be inspected by COTR and approved to verify final installation and operational requirements.

I. Installation including detailed timing and coordination with Contracting Officers Technical Representative (COTR) and Facility Management Services (FMS) defining any electrical outages requires 15 day notice for outage coordination. Replacement will need to be after hours/weekends* as necessary to minimize hospital disruption.

V. FUNCTIONAL/OPERATIONAL TESTING

A. Contractor to develop and prepare a detailed Functional and operational test plan that is to be submitted to the COTR for acceptance 15 days prior to final testing.

VI. CONSTRUCTION PERIOD OF SERVICE/SCHEDULE:

A. The contractor shall prepare a construction schedule using current revision of Microsoft project identifying as a minimum:

1. Draft to be provided at pre construction meeting.
2. Final schedule will be provided prior to construction start and be approved by a member of FMS team or COTR.
3. Schedule will include, start date, survey period, ECHCS COTR inspection points, survey complete, submittals and any other mile stones necessary for the contractor to verify project completion.
4. Period of performance shall be determined by the contractor and coordinated with COTR and Contracting Officer.

VII. INFECTION/DUST CONTROL:

A. Reference *Infection Control Risk Assessment Matrix of Precautions for Construction & Renovation* See specification 01 00 00 1.8

VIII. HOURS OF OPERATION.

The contractor shall perform the services required under this contract 7:30 a.m. through 5:00 p.m. Monday through Friday, except Federal Holidays listed below. Operations outside these hours shall require prior approval of the contracting officer. The contractor shall notify the COTR of any delays. Recognized holidays are:

- New Year's Day - 1 January
- Martin Luther King Day - 3rd Monday in January
- Washington's Birthday - 3rd Monday in February
- Memorial Day - last Monday in May
- Independence Day - 4 July
- Labor Day - 1st Monday in September
- Columbus Day - 2nd Monday in October
- Veteran's Day - 11 November
- Thanksgiving Day - 4th Thursday in November
- Christmas Day - 25 December

When the scheduled service falls on a recognized holiday, the holiday's service shall be performed by the contractor ***on the next business day***, along with that day's service, or as the contractor and government may agree, at no additional cost to the government.

Air Handlers statistics, location, type etc						
Air Handler unit	Fan or Pump	Motor size (HP)	Location	Premium efficient	Base line Bid	Add Alternate Bid
AC1	SF-1	30	6th floor large south equip room	N	Replace	
	RF-1	3	6th floor large south equip room	N		Alt Bid
	EF-1	1	6th floor large south equip room	N		
AC2	SF-2	20	6th floor large south equip room	Y		
	RF-2	1	6th floor large south equip room			
AC3	SF-3	30	6th floor large south equip room	Y		
	RF-3	7.5	6th floor large south equip room	N		Alt Bid
AC4	SF-4	40	6th floor large south equip room	N	Replace	
	RF-4	2	6th floor large south equip room	N		
AC5	SF-5-1	30	6th floor large south equip room	N	Replace	
	SF-5-2	7.5	6th floor large south equip room	N		Alt Bid
	EF-5-1	5	6th floor large south equip room	N		
	EF-5-2	5	6th floor large south equip room	N		
	p-5	2	6th floor large south equip room	N		
AC6	SF-6	7.5	4th floor	N		Alt Bid
	RF-6	1.5	4th floor	N		
AC7	SF-7	15	6th floor	Y		
	RF-7	2	6th floor	N		
	P5	7.5	6th floor	N		Alt Bid
AC8	SF-8	10	6th floor	N		
	RF-8	1.5	6th floor	N		
AC9	SF-9	20	6th floor	N	Replace	
	RF-9	2	6th floor	N		
AC10	SF-10	15	6th floor patio	N	Replace	
AC13	SF-13	30	9th floor North	N	Replace	
	P-13	1	9th floor North	N		
AC14	SF-14	20	9th Floor South	N	Replace	
	P-14	1	9th Floor South	N		
AC15	SF-15	15	9th Floor North	N	Replece	
	P-15	1	9th Floor North	N		
AC16	SF-16	20	9th floor South	N	Replace	
	P-16	1	9th floor South	N		
AC17	SF-17	10	5th floor penthouse	Y		
	RF-17	1	5th floor penthouse	N		
AC19	SF-19	20	8th Floor Penthouse SW	Y		
	P-19	1	8th Floor Penthouse SW	N		
	EF-19-2	10	8th Floor Penthouse SW	N	Replace	
AC20	SF-20	15	5th floor SW	N	Replace	
	RF-20	1.5	5th floor SW	N		
AC21	SF21	30	8th floor Pent house SW	Y		
	RF-21	5	8th floor Pent house SW	N		Alt Bid
			4			

APPENDIX. 1

A. PHOTOGRAPHS



Figure 1 – SF-5-1 6th floor



Figure 2- SF-9 6th floor



Figure 3 SF-3 6th floor (Just replaced)



Figure 4- SF 2 6th floor (Just replaced)



Figure 5 - RF 3 6th floor



Figure 6 - Supply fan 5



Figure 6 - SF-4 (6th floor)



Figure 7 - SF-7 (6th floor)



Figure 8 - SF-SF-1 (6th floor north)

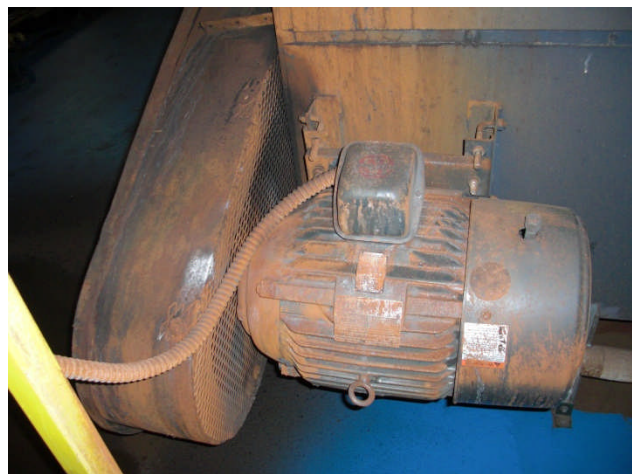


Figure 9 - SF-14 (9th floor south)



Figure 10 - SF-15 (9th floor north)



Figure 11 – SF-16 (9th floor south)



Figure 12 - SF-14 (9th floor south)



Figure 13 – SF-13 (9th floor north)



Figure 14 – (SF-16 5th floor)



Figure 15 – (SF-20 5th floor)

Photo Not Shown see below:

Task 5 - ECHCS Steam Trap Survey and Replacement

I.E.1 DESCRIPTION OF SERVICES.

This task involves the survey of approximately 150-200 steam traps at the Denver VA Center. The contractor shall supply all necessary tools, equipment, certified/trained personnel required to conduct an in-depth analysis of the plant steam system and steam trap condition. The survey will include field investigation and computer analysis of each steam trap per the design criteria provided below. Location will include all Denver VA facilities feed by the main steam plant boilers. (Reference attachment A previous steam trap analysis with identified trap locations and numbers. The contractor shall use this as a basis of work to be performed).

I.E.2 STEAM TRAP SURVEY

- A. All steam traps are to be located, identified, and tagged with a stainless steel tag and clip verified with existing report provided.
- B. Each trap is to be tested to determine its operating condition. The methods used shall include the use of ultrasonic listening device, infra-red heat measurements, and visual inspection where possible.
- C. A temporary red and white paper tag is to be attached to each FAILED trap in addition to the stainless steel ID tag.
- D. Notes are to be made of specific problems. i.e.: Water Hammer, Poor or improper insulation, steam leaks in piping or valves, improper installation of traps, and other steam related problems.
- E. On the job training is to be provided to those plant personnel who are helping the technicians with the survey. One plant maintenance person should accompany each survey team. This will be submitted as an option for pricing.
- F. Data collected for each steam trap will include:
 - i. Steam trap applications and estimated number of traps to be surveyed

- ii. Tag Number
- iii. Steam pressure
- iv. Location
- v. Elevation
- vi. Manufacturer and Model Number
- vii. Connection Size
- viii. Pressure:
 - 1. (P.I.) Pressure In – actual steam pressure going into trap
 - 2. (P.O.) Pressure Out – actual steam pressure coming out of trap
- ix. Application (Drip, Tracer, Coil, Process, Air Vents, Liquid Drainers)
- x. Equipment (Unit Heater, Radiator, Humidifier, etc.)
- xi. Piping (Direction, Valve In, Strainer, Valve Out)
- xii. Trap Condition (Operating Mode)
- xiii. Comments

G. All personnel testing steam traps shall be certified steam trap survey technicians, Level II or higher and shall have a min of two years field training and certification to level II or equal to Armstrong, UE systems Inc. or other suitable testing authority see attached link.

http://uesystems.com/training_course_info.asp

H. Survey Report: A report shall be furnished within 30 days of completion of the survey. The executive summary of the report shall include an estimate of the monetary costs associated with the overall steam losses caused by defective traps, a list of the defective traps prioritized by their associated costs, and a detailed breakdown of the defective traps by application, manufacturer, and trap type. The data presented in the body of the report shall include all of the items listed above in 6) for each steam trap, in addition to each trap's overall condition, the quantity and monetary cost of the steam losses associated with each defective trap, a recommended replacement for all defective

traps including manufacturer / model number, and comments noting general steam system issues.

I. All work shall be accomplished in accordance with the most current edition of the following criteria:

1. VA PG-18-1, Master Construction Specifications
2. VA PG-18-3, VA Design and Construction Procedures
3. National Fire Protection Association Codes (NFPA)
4. International Building Code (IBC)
5. OSHA Standards
6. All other applicable industry codes and VA requirements ref

http://vaww.va.gov/facmgt/standard/spec_idx.asp

I.E.3 INSTALLATION OF NEW TRAPS

Contractor to assume that a 30% replacement will be required and will provide quote to represent that number of various sizes. If the number of traps exceeds the 40% or the cost number is greater than initial estimates then renegotiations may be necessary otherwise the contractor will proceed with the repair or replacement as necessary.

I.E.4 QUALITY ASSURANCE AND STANDARDS

A. All work, material or equipment shall comply with the codes, ordinances and regulations of the local government having jurisdiction, including the regulations of serving utilities and any participating government agencies having jurisdiction.

B. The Contractor shall provide CADD drawings per Specifications if required. The Contractor shall verify all dimensions and clearances prior to commencement of installation.

C. The Contractor shall verify all points of connection with the manufacturer's requirements, instructions, or recommendations prior to installation. The actual dimensions, weights, clearance requirements and

installation requirements shall be verified and coordinated by the contractor.

D. Contractor shall note on daily logs the areas of work for each day.

E. Contractor shall complete Inspection Log Spreadsheet and report the locations and conditions of steam traps to be submitted with final report.

II. CONSTRUCTION PERIOD OF SERVICE/SCHEDULE:

A. Period of performance to be 90 days from NTP

B. The contractor shall prepare a construction schedule using current revision of Microsoft project identifying as a minimum:

1. Draft to be provided at pre construction meeting.
2. Final schedule to be provided prior to construction start and approved by a member of FMS team or COTR.
3. Schedule will include
 - a) start date NTP,
 - b) survey period,
 - c) ECHCS COTR inspection points,
 - d) survey complete,
 - e) sketch, installation templates
 - f) submittals
 - g) Phase I procurement
 - h) Phase II installation
 - i) Phase III Project completion and functional, fit checks test and reports.
 - j) Provide all milestones necessary for the contractor to verify project completion.

III. INFECTION/DUST CONTROL:

Reference *Infection Control Risk Assessment Matrix of Precautions for Construction & Renovation* provided below. Inspection Activity to remove ceiling tiles to view walls above the ceiling is generally a TYPE A activity.

Sealing of penetrations requiring only Fire caulking is generally a TYPE A activity. Patching larger penetrations which require Cutting of sheetrock and sanding is TYPE B up to TYPE C for larger patches using the IC Matrix below, determine the level of infection control precautions required. Refer to specification 01010 for required infection control precautions by CLASS. Coordinate with VA COTR and IC personnel.

Construction Project Type

Patient Risk Group	Type A	Type B	Type C	Type D
Low Risk Group	I	II	II	III/IV
Medium Risk Group	I	II	III	IV
High Risk Group	I	II	III/IV	IV
Highest Risk Group	II	III/IV	III/IV	IV

IV. HOURS OF OPERATION:

A. The contractor shall perform the services required under this contract 7:30 a.m. through 4:00 p.m. Monday through Friday, except Federal Holidays listed below. Operations outside these hours shall require prior approval of the contracting officer. The contractor shall notify the COTR of any delays. Recognized holidays are:

- New Year's Day - 1 January
- Martin Luther King Day - 3rd Monday in January
- Washington's Birthday - 3rd Monday in February
- Memorial Day - last Monday in May
- Independence Day - 4 July
- Labor Day - 1st Monday in September
- Columbus Day - 2nd Monday in October
- Veteran's Day - 11 November
- Thanksgiving Day - 4th Thursday in November
- Christmas Day - 25 December

When the scheduled service falls on a recognized holiday, the holiday's service shall be performed by the contractor ***on the next business day***, along with that day's service, or as the contractor and government may agree, at no additional cost to the government.

V. APPENDIX

APPENDIX A: PHOTOGRAPHS BLDG 8 & IR THERMOGRAPHY STUDY

Photographs of Building 8 Boiler House are provided along with the IR Thermography study. This will provide some guidance to areas that require additional thermal blankets and will assist in the definition phase of this project. There will be a project walk that will coordinate all blanket and insulation areas during the proposal phase and again at NTP.



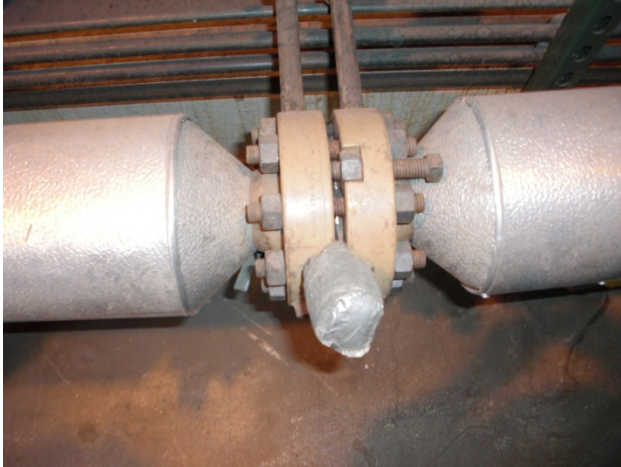
Multiple steam lines, valves and elbows lacking proper insulation.



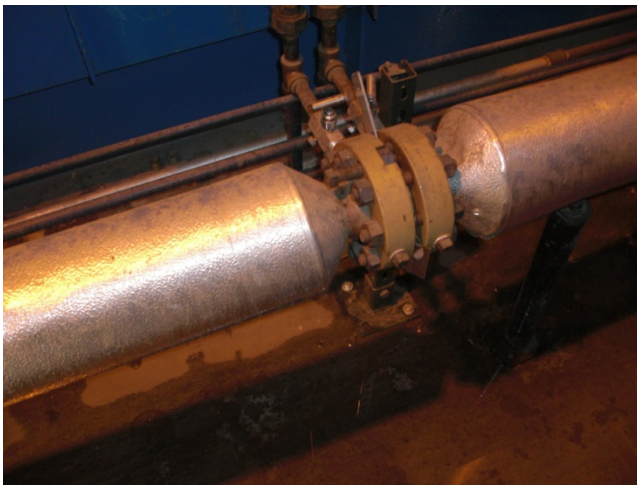
High Pressure Steam shut off Valve several



Damaged insulation/blanket at piping intersection



Insulation blanket required



Sample sensor location identification



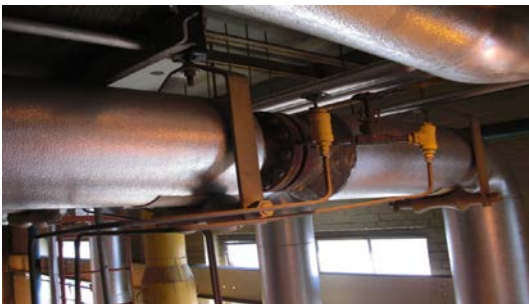
Missing insulation on valves in Boiler room



Insulation missing on valves



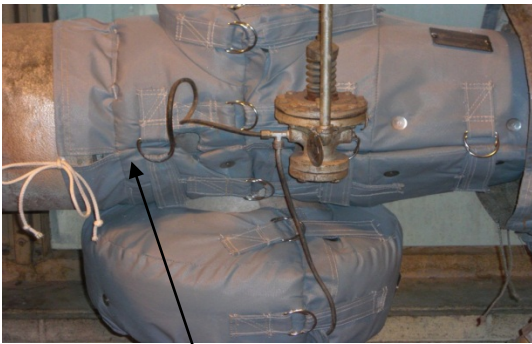
Condensate



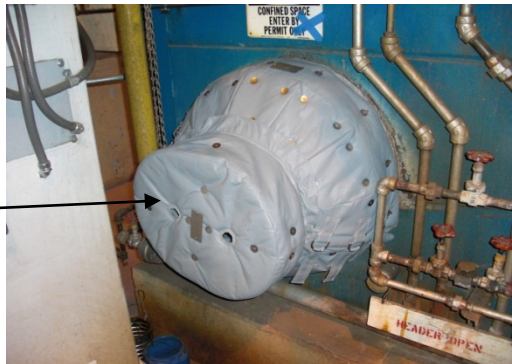
Un-insulated fittings on ceiling



Un insulated valve



Examples of suggested thermal
blanket installation



APPENDIX B: SENSOR PHOTOGRAPHS



Broken and damaged sensor



Sensor plant broken



Typical broken sensor



Damaged sensor

APPENDIX C: GARAGE PHOTOGRAPHS



Photo 1 garage first floor south east side



Photo 2 Typical current MH lighting mounting system



Photo 3 Typical string potential to reduce number



Photo 4 garage 1st floor looking west at entrance.



Photo 5 parking garage typical MH mounting arrangement

APPENDIX D: MOTOR PHOTOGRAPHS



Figure 1 – SF-5-1 6th floor



Figure 2- SF-9 6th floor



Figure 3 SF-3 6th floor (Just replaced)



Figure 4- SF 2 6th floor (Just replaced)



Figure 5 - SF-4 (6th floor)



Figure 6 - SF-7 (6th floor)



Figure 7 - SF-SF-1 (6th floor north)

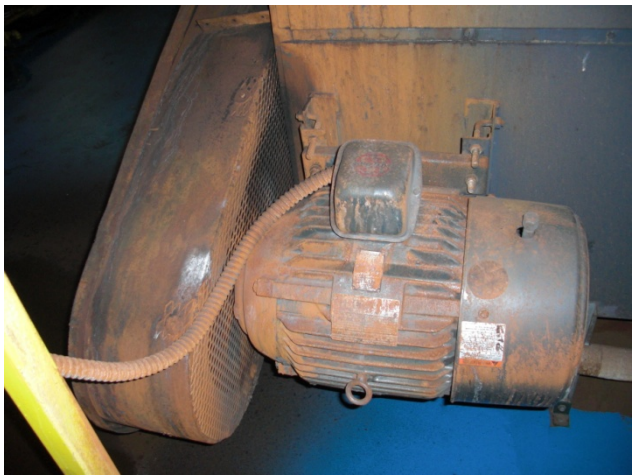


Figure 8 - SF-14 (9th floor north)



Figure 9 - SF-15 (9th floor north)



Figure 10 - SF-16 (9th floor south)



Figure 11 - SF-14 (9t floor south)

Photo Not Shown see below:

SF -10 (6th floor)

SF-17 (5th floor)

SF -20 (5th floor north west)

SF-21 (5th floor south west)

XX-XX Signifies that motors have already been up graded.