



Job Order Contract
Request For Proposal

Date Issued: 01/04/19

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To: Brent Honnoll
Dynasel USA
1223 Solano Ave, Suite 8
Albany, CA 94706

From: Steve Rottmayer
Energy Project Manager

Phone: 408-496-0305

Phone:

Project Title: BHCS A Street HVAC & ADA Upgrades

Job Order No: 18013-18034.0

Alameda County General Services Agency requests that you provide a Cost Proposal for the subject Job Order per the Scope of Work.

The following document is to be exported through eGordian by the Contractor electronically:

1. Contractor Cost Proposal

Hard copies of the following documents are to be signed and delivered by the Contractor:

1. Contractor Cost Proposal
2. Construction Duration Schedule
3. Backup for Non-Prepriced Line Items
4. Material or Equipment Submittals (if required by PM in advance of issuance of the Job Order)

Additional Requirements:

Liquidated Damages: WILL NOT APPLY

This request is subject to the terms and conditions of JOC Contract: 18013. Please refer to the attached Scope of Work for additional information.

Your proposal is due on or before 02/15/2019 @ 2:00 PM.

Note: Contractor to notify PM immediately if due date cannot be met.

Attachment: Brief Scope of Work



Job Order Contract

Brief Scope of Work

Date: January 04, 2019 11:50 am
Work Order No.: 18013-18034.0
Work Order Name: BHCS A Street HVAC & ADA Upgrades
Location: 258 West A Street, Hayward, CA 94541
Brief Scope:

Brief Scope of Work

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The Work of this Contract consists of furnishing all material, labor, tools, machinery, equipment, programming, control devices and sensors, floor plans and graphic pages, power and control wiring, software, and services necessary to complete the work specified herein and shown or noted in these documents.

A. Bathroom American Disabilities Act (ADA) Upgrade

The women's and men's restrooms at the shelter require a complete remodel for ADA compliance. The scope of work includes removing some old bathroom fixtures, installing new fixtures, relocating existing equipment and modifying doorways and signage so the restrooms meet ADA compliance. The number of fixtures will remain the same, but they will be relocated per the drawings.

(1) Demolition Work

- (a) In general, mobilize, demolish, and dispose of existing toilets, partitions, shower inserts, all existing flooring tile and damaged substrate and concrete for new shower pan as shown in the Owner provided drawings.
- (b) All equipment and material not required as part of the new installation shall be disposed by Contractor.

(2) New/Installation Work

- (a) This scope includes all necessary steps and personnel to purchase mobilize and install new materials to convert two (2) existing showers to ADA compliant showers as shown in the owner provided drawings. Contractor to provide all necessary material and fixtures to provide fully operational showers. Contractor shall also modify the existing partitions to provide space for the ADA showers.
- (b) Contractor to install additional ancillary equipment (e.g. grab bars, shower seats, etc.) as shown in the Owner's drawings, for ADA compliance. All new grab bars and shower curtains shall be anti-ligature devices from the list of recommended products in the attached EXCEL file.
- (c) Contractor to reposition existing fixtures including toilets, sinks, urinals and all ancillary equipment (e.g. towel dispensers, soap dispensers, etc.) as shown in Owner's drawings so everything is located with enough space and at the appropriate height per ADA requirements.

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- (d) Contractor to modify and remount restroom entrance doors to provide minimum clearance and appropriate signage, per the Owner's drawings, for ADA compliance.
- (e) Contractor shall install new ceramic tile for the entire floor.

B. Installation of Rooftop Energy Recovery Ventilation Unit and Dedicated Outside Air Ventilation System

Work associated with this rooftop energy recovery ventilation (ERV) unit includes, but it is not limited to, removal of the existing gas-fired, heating and ventilation (HV) unit and all ancillary equipment not required by the replacement unit, purchase and installation of a new ERV on the existing roof curb, startup of equipment, connections of ductwork and curbs, piping, anchoring, control devices, and electrical and control wiring for a complete, functional, and facility integrated system. Contractor shall also coordinate with the Owner for necessary controls system and wiring interface.

(1) Demolition Work

- (c) In general, mobilize off the roof, demolish, and dispose of existing HV unit including valves, fittings, supports, electrical, controls and other associated appurtenances to make ready for the installation of the new ERV.
- (d) Contractor shall safe-off, disconnect, and remove existing natural gas, and electrical connections for the existing HV unit. Point of termination shall be 6 inches above roofing surface.
- (e) Demolish and dispose of the entire ventilation distribution system including all ductwork, balancing dampers, diffusers and grills and all associated equipment not required by the new design.
- (f) All equipment and material not required as part of the new installation shall be disposed by Contractor. Contractor shall provide all recycling receipts in order to meet the waste diversion requirements provided herein.

(2) New/Installation Work

- (f) This scope includes all necessary steps and personnel to purchase mobilize, install, and connect the new ERV and all required ancillary equipment for the building HVAC and to control the system to

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provide a complete and fully operable, facility integrated system in strict accordance with all manufacturers' specifications, recommendations, and Owner provided designs. The ERV shall be fully functional and commissioned at the close of the project.

- (g) This scope of work includes, but it is not limited to, all necessary equipment and connections to incorporate the ERV into the existing building, mechanical, and electrical systems. The Contractor shall install supply and return ductwork, new supply diffusers and return grills per the owner's mechanical design drawings. The contractor shall furnish and install all structural support necessary to complete the installation of the ERV, associated ductwork and ancillary equipment. Where necessary, the Contractor shall modify the existing roof curbs to mitigate vibration.
 - (h) The ERV will consist of a single packaged unit with supply and exhaust fans, fixed-plate heat exchanger(s), filters, and a bypass section enabling the unit supply ventilation to the space without performing energy recovery. ERV units that utilize enthalpy wheels are not acceptable. The ERV shall have a minimum energy transfer rate of 50% at all conditions where energy recovery is performed.
 - (i) The Contractor shall be responsible for all the electrical power requirements associated with the new ERV installation including any changes or upgrades to any electrical equipment and materials necessary due to increased or decreased power requirements of the new equipment.
 - (j) All rooftop electrical metallic tubing (EMT) shall be weather-tight and protected against corrosion and environment. Where applicable, Contractor may be required to paint to protect the conduit from corrosion. All rooftop conduit shall be supported and meet all roofing manufactures requirements to maintain existing warranty.
 - (k) The Contractor shall complete testing, adjustment and balancing (TAB) to provide the air flows specified in the Owner's mechanical design drawings. The contractor shall provide the Owner a report that shows the results and notes any deviations from the design.
- (3) Controls, Overview
- (a) Furnish, install, and wire all controllers, sensors and program the sequence of control. The new ERV controllers shall be BACNET

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MS/TP compatible so the controllers can communicate with the existing Delta Control system without the need for gateways, field servers, or protocol translators. Any use of these devices must receive approval from Owner prior to installation.

- (b) All BACnet I/O objects and software points available from ERV shall be integrated into existing Delta enteliweb system for monitoring, control, and trended in Delta Historian. All the control points shall be read/write enabled through the existing Delta control system.
- (c) The following sensors shall be required for control and alarms
 1. Temperature sensors (4) for outside, exhaust, supply and return air
 2. Differential pressure sensors (2) for filter alarms
 3. Differential pressure sensors (2) for measuring pressure drop across the energy recovery core.
 4. Current switches (2) for supply and exhaust fan status
 5. Supply and return duct static sensors (2)
 6. Room pressurization sensor in main multipurpose room (1)
- (d) Unless otherwise indicated in SOOs, control loops shall be enabled and disabled based on the status of the system being controlled to prevent wind-up.
- (e) When SOOs use outdoor air temperature present value and there are multiple outdoor air sensors, the physically closest sensor reading shall be used.
- (f) All setpoints, timers, deadbands, PID gains, etc. listed in sequences shall be capable of being adjusted by the operator without having to access programming whether indicated as adjustable in sequences or not. Software (virtual) points shall be used for these setpoints. Fixed scalar numbers shall not be imbedded in programs unless the value will never need to be adjusted.

(4) Controls, Sequences of Operation

- (a) Energy Recovery Unit shall be scheduled by the Delta Energy Management. The initial schedule shall be continuous operation with the ability to adjust.

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- (b) Bypass economizer control: Two-position dampers will enable 100% of the airflow to bypass the fixed-plate heat exchangers when outside air conditions are conducive to free cooling or free heating.
 - (c) Energy Recovery Mode: Two-position dampers will enable 100% of the airflow to pass through the fixed-plate heat exchangers.
 - (d) The supply and exhaust fans shall be schedule through the Delta Energy Management System. Fan speed shall be set to maintain the ventilation air flow requirements per the Owner's mechanical drawing.
- C. Replace existing kitchen make-up air (MUA) unit and kitchen exhaust fan currently on the roof with a new Kitchen Ventilation System consisting of a combined makeup air unit, exhaust fan, ductwork and exhaust hood in the space.

Work associated with this system replacement includes, but it is not limited to removal of existing make-up air (MUA) unit, kitchen exhaust fan, existing ductwork and existing kitchen hood along with all ancillary equipment not required for the replacement unit and associated equipment.

Work also includes the purchase, installation and start-up of new Kitchen Ventilation System with new roof curb, ductwork, piping, anchoring, control devices, and electrical and control wiring for a complete, functional, and facility integrated system

- (1) Demolition Work
 - (a) In general, mobilize off the roof, demolish, and dispose of existing MUA and associated kitchen exhaust fan including valves, fittings, supports, ductwork and other associated appurtenances to make ready for the installation of the new Kitchen Ventilation System.
 - (b) Contractor shall safe-off, disconnect, and remove electrical connections for the existing systems.
 - (c) Demolish and dispose of the entire ventilation distribution system including all ductwork, balancing dampers, diffusers and grills and all associated equipment not required by the new design.
 - (d) All equipment and material not required as part of the new installation shall be disposed by Contractor. Contractor shall provide all recycling receipts in order to meet the waste diversion requirements provided herein.

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(2) New/Installation Work

- (a) This scope includes all necessary steps and personnel to purchase, mobilize, install, and connect a new Kitchen Ventilation System that consists of one make-up air unit (MUA), exhaust fan, ductwork, space exhaust hood and all required ancillary equipment. The scope is to provide a complete and fully operable, facility integrated system in strict accordance with all manufacturers' specifications, recommendations, and Owner provided designs. The new Kitchen Ventilation System is to be fully functional and commissioned at the close of the project.
- (b) This scope of work includes, but not limited to, all necessary equipment and connections to incorporate the Kitchen Ventilation System into the existing building, mechanical, and electrical systems. The Contractor shall install supply and exhaust ductwork, new supply diffusers and exhaust grills per the owner's mechanical design drawings. The contractor shall furnish and install all structural support necessary to complete the installation of the system, associated ductwork and ancillary equipment. Where necessary, the Contractor shall modify the existing roof curbs to mitigate vibration.
- (c) The Contractor shall be responsible for all the electrical power requirements associated with the new Kitchen Ventilation System installation including any changes or upgrades to any electrical equipment and materials necessary due to increased or decreased power requirements of the new equipment.
- (d) All rooftop electrical metallic tubing (EMT) shall be weather-tight and protected against corrosion and environment. Where applicable, Contractor may be required to paint to protect the conduit from corrosion. All rooftop conduit shall be supported and meet all roofing manufactures requirements to maintain existing warranty.

(3) Controls, Overview

- (a) Furnish, install, and wire all controllers, sensors and connect to a manual control switch in the kitchen.

(4) Controls, Sequence of Operation

- (a) No external sequence of operation is required.

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- D. Remove three (3) existing exhaust fans and install three (3) new exhaust fans.

Work associated with this system replacement includes removal of three (3) existing exhaust fans, existing ductwork and exhaust grills with all ancillary equipment not required for the replacement fans and associated equipment.

Work also includes the purchase, installation and start-up of new exhaust fans with new roof curb, ductwork, exhaust grills, anchoring, control devices, and electrical and control wiring for a complete, functional, and facility integrated system.

(1) Demolition Work

- (a) In general, mobilize off the roof, demolish, and dispose of existing exhaust fans, fittings, supports, ductwork and other associated appurtenances to make ready for the installation of the new exhaust fans.
- (b) Contractor shall safe-off, disconnect, and remove electrical connections for the existing systems.
- (c) Demolish and dispose of the entire ventilation distribution system including all ductwork, balancing dampers, diffusers and grills and all associated equipment not required by the new design.
- (d) All equipment and material not required as part of the new installation shall be disposed by Contractor. Contractor shall provide all recycling receipts in order to meet the waste diversion requirements provided herein.

(2) New/Installation Work

- (a) This scope includes all necessary steps and personnel to purchase mobilize and install the new exhaust fans, ductwork and exhaust grills. The new exhaust fans shall be connected to the existing control system that consists of timeclocks. The scope is to provide complete and fully operable, facility integrated exhaust systems in strict accordance with all manufacturers' specifications, recommendations, and Owner provided designs. The new exhaust fans are to be fully functional and commissioned at the close of the project.
- (b) This scope of work includes, but it is not limited to, all necessary equipment and connections to incorporate the exhaust fans into the

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existing building, mechanical, and electrical systems. The Contractor shall install supply and exhaust ductwork, new supply diffusers and exhaust grills per the owner's mechanical design drawings. The contractor shall furnish and install all structural support necessary to complete the installation of the system, associated ductwork and ancillary equipment. Where necessary, the Contractor shall modify or replace the existing roof curbs to anchor the new system.

- (c) The Contractor shall be responsible for all the electrical power requirements associated with the new exhaust fan installation including any changes or upgrades to any electrical equipment and materials necessary due to increased or decreased power requirements of the new equipment.
- (d) All rooftop electrical metallic tubing (EMT) shall be weather-tight and protected against corrosion and environment. Where applicable, Contractor may be required to paint to protect the conduit from corrosion. All rooftop conduit shall be supported and meet all roofing manufactures requirements to maintain existing warranty.

(3) Controls, Overview

- (a) Furnish, install, and wire all controllers, sensors and program the sequence of control. The new exhaust fan controller shall be BACNET MS/TP compatible so the controllers can communicate with the existing Delta Control system without the need for gateways, field servers, or protocol translators. Any use of these devices must receive approval from Owner prior to installation. All the control points shall be read/write enabled through the existing Delta control system.
- (b) The following sensors shall be required for control
 - 1. Current switches (2) for supply and exhaust fan status
- (c) Unless otherwise indicated in SOOs, control loops shall be enabled and disabled based on the status of the system being controlled to prevent wind-up.

(4) Controls, Sequence of Operation

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- (a) The exhaust fans shall be enabled by the schedule programmed within the Delta entelliweb control system. The default schedule shall be 24 hours per day seven days per week, but shall be adjustable.

E. Install six (6) New Variable Refrigerant Flow (VRF) Systems

The scope includes installation, start-up and commissioning of six (6) new Panasonic variable refrigerant flow (VRF) systems consisting of six (6) new condensing units on new roof curbs and twenty (20) new fan-coil units in the spaces. Work includes, but it is not limited to, all connections of refrigerant piping, condensate drain piping, anchoring, control devices, and electrical and control wiring for a complete, functional, and facility integrated system. Contractor shall also coordinate with the Owner for necessary controls system and wiring interface.

(1) Demolition Work

- (a) There is no existing system to remove

(2) New/Installation Work

- (a) This scope includes all necessary steps and personnel to purchase, mobilize and install six (6) new VRF systems and install new individual controllers connected to the existing Delta control network for a complete and fully operable, facility integrated HVAC system in strict accordance with all manufacturers' specifications, recommendations, and Owner provided designs. Contractor shall furnish, mobilize, and install all required ancillary equipment to provide new VRF systems that are fully functional and commissioned at the close of the project.
- (b) This scope of work includes using **Panasonic certified installers** to complete all necessary mechanical equipment and other necessary connections to the existing building, mechanical and electrical systems. The Contractor shall install the condensing units, fan-coil units and associated appurtenances per the Owner's mechanical design drawings and manufacturer's specifications. The contractor shall furnish and install any additional structural support necessary to complete the installation of the condensing and fan-coil units.
- (c) Contractor shall furnish and install new refrigerant piping per manufacturer specifications or industry standard, whichever is more stringent.

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- (d) Contractor shall furnish and install new condensate piping, per industry standards, and discharge away from service areas of the unit and direct towards existing sewer drains.
 - (e) For the condensing units, provide all field measurements and verification of existing conditions necessary to layout and provide all labor, materials, equipment, and supervision necessary to complete the work as described in the Scope of Work.
 - (f) The Contractor shall be responsible for all electrical power requirements associated with the new VRF systems including any changes or upgrades to any electrical equipment and materials necessary due to increased or decreased power requirements of the equipment.
 - (g) All rooftop electrical metallic tubing (EMT) shall be weather-tight and protected against corrosion and environment. Where applicable, Contractor may be required to paint to protect the conduit from corrosion. All rooftop conduit shall be supported per the manufactures requirements and recommendations to maintain existing warranty
- (3) Controls, Overview
- (a) Furnish, install, and wire all controllers, sensors and program the sequence of control. The new VRF controllers shall be BACNET MS/TP compatible so the controllers can communicate with the existing Delta Control system without the need for gateways, field servers, or protocol translators. Any use of these devices must receive approval from Owner prior to installation.
 - (b) All BACnet I/O objects and software points available from the VRF systems shall be integrated into existing Delta enteliweb system for monitoring, control, and trended in Delta Historian. All the control points shall be read/write enabled through the existing Delta control system.
 - (c) Unless otherwise indicated in SOOs, control loops shall be enabled and disabled based on the status of the system being controlled to prevent wind-up.

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- (d) All setpoints, timers, deadbands, PID gains, etc. listed in sequences shall be capable of being adjusted by the operator without having to access programming whether indicated as adjustable in sequences or not. Software (virtual) points shall be used for these setpoints. Fixed scalar numbers shall not be imbedded in programs unless the value will never need to be adjusted.

(4) Controls, Sequences of Operation

- (a) Each zone shall have separate unoccupied and occupied setpoints, and separate heating and cooling setpoints. Default setpoints shall be:
 - 1. The occupied heating setpoint shall be 68°F and the occupied cooling setpoint shall be 74°F in exterior zones and 73°F interior zones.
 - 2. The unoccupied heating setpoint shall be 50°F and the unoccupied cooling setpoint shall be 90°F.
- (b) The software shall prevent the occupants from adjusting the setpoints outside the limits presented below and return the setpoints to the default position after 120 minutes (adjustable).
 - 1. The heating setpoint from exceeding the cooling setpoint minus 2°F adjustable (in other words the minimum deadband shall be 2°F)
 - 2. The unoccupied heating setpoint from exceeding the occupied heating setpoint; and
 - 3. The unoccupied cooling setpoint from being less than the occupied cooling setpoint.
- (c) The operative zone setpoint shall be determined by VRF system mode (i.e. whether the system is in heating or cooling).
- (d) Hierarchy of Setpoint Adjustments: The following adjustment restrictions shall prevail in order from highest to lowest priority:
 - 1. Setpoint overlap restriction

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2. Scheduled setpoints based on VRF system mode

- (e) Local override: When thermostat override buttons are depressed, the request for Occupied Mode operation shall be sent to the zone controller for 60 minutes (adjustable) causing the zones to operate in Occupied Mode for that period of time.

(f) VRF System Modes

The VRF systems shall be programmed to calculate whether the system should be in heating, cooling or ventilation mode based on the total difference between zone temperature setpoints and zone temperature in all the zones served by the corresponding VRF system.

For the calculation, the following will apply:

1. When in Heating Mode, all zone temperatures above the heating setpoint will be given a value of zero.
2. When in Cooling Mode, all zone temperatures below the cooling setpoint will be given a value of zero.

The mode shall be determined as follows

1. Heating Mode: when the sum of the differences between zone setpoints and zone temperatures is less than zero.
2. Cooling Mode: when the sum of the differences between zone setpoints and zone temperatures is greater than zero.
3. Ventilating Mode: when not in either the Heating or Cooling Mode, but fresh air is required.
4. Unoccupied Mode: not in any other Mode

(g) Alarms

1. Inhibit alarms after zone setpoint is changed for a period of 10 minutes per degree of change (for example if setpoint changes from 68°F to 70°F, inhibit alarm for 20 minutes after the change) and while Zone Area is in Warm-up or Cool-down Modes.

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2. If the zone is 4°F above cooling or below heating setpoint for more than 10 minutes.
3. If the zone is 4°F above cooling or below heating setpoint for more than 10 minutes.

F. Energy Management Control System (EMCS)

In General, this scope of work includes removing all ancillary control equipment and installing new controllers for a new energy recovery ventilation (ERV) unit and six (6) new variable refrigerant flow (VRF) systems (evaporators and condensers). The new controllers shall be BACnet MS/TP compatible to enable the controllers to communicate with the existing Delta enteliWEB network without the need for gateways, field servers, or protocol translators. Any use of these devices must receive approval from the County's Project Manager prior to installation.

- (1) Integrate control of VRF systems and ERV.
 - (a) Spaces shall be scheduled and be at temperature setpoint prior to building occupancy per previous sections.
- (2) Furnish and install all necessary controls, sensors, control wiring and power wiring required to implement all control sequences defined in this document.
- (3) All fire smoke control shall remain controlled by existing system. Contractor will notify County's Project Manager in writing if any fire life safety work is required to complete the project.
- (4) Thermostats cannot be installed in any areas that are regularly occupied by the public such as the Main Common Area, Men's Dormitory, Women's Dormitory, TV Lounge, Common Hallway and Laundry Room. The thermostats controlling the units serving those areas shall be placed in a secure location such as the wall adjacent to the front desk.
- (5) All low-voltage wiring shall meet controls manufacturer's specifications. All wiring installed in plenum shall be plenum rated cable and may be

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without EMT. All control wiring not installed in return air plenums shall be installed in EMT.

- (6) Furnish, install, and wire digital controllers, equipment and calibrate for control of the points listed in the points list attachment. The ERV unit and each VRF system (6) shall have a dedicated graphics pages with respective points displayed. All points and control will be field calibrated, functionally tested, and coordinated with the assistance and help from the County. All additional points shall be provided to the County for review and approval.
- (7) Contractor to furnish enteliViz with copies of the graphics pages described in the next section.
- (8) Graphics Pages
 - (a) All site-specific graphics shall be developed in a manner that will ensure programming quality and uniformity among the various buildings.
 - (b) Graphical display shall be 1280 x 1024 pixels or denser, 256 color minimum.
 - (c) Links
 1. Graphics shall include hyperlinks which when selected (clicked on with mouse button) launch applications, initiate other graphics, etc.
 2. Screen Penetration: Links shall be provided to allow user to navigate graphics logically without having to navigate back to the home graphic.
 3. Links to project information including , but not limited to: controls drawings, mechanical drawings, electrical drawings, equipment specification sheets.
 4. On each MEP system and subsystem graphic, provide links to display in a new window the information listed below.
 - Point override status shall be clearly displayed on graphics for each point, such as by changing color or flag.

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- The color of symbols representing equipment shall be able to change color or become animated based on status of binary point to graphically represent on/off status.
- (d) MEP Systems Graphic Displays
1. Each MEP system (ERV, VRF-1, VRF-2, etc.) shall have one graphic that is a schematic representation of the system and a second graphic that provides performance data in a tabular format.
 2. Schematics shall be 2-D or 3-D representations of each HVAC system on separate pages.
 3. All relevant I/O points and setpoints being controlled or monitored for each piece of equipment shall be displayed with the appropriate engineering units.
 4. Animation or equipment graphic color changes shall be used to indicate on/off status of mechanical components.
 5. Indicate all adjustable setpoints and high and low limits (for automatically reset setpoints), on the applicable system schematic graphic
 6. Show weather conditions (local building outside air temperature and humidity) in the upper left hand corner of every graphic.
 7. CAD Files: Available drawings will be made available to the Contractor in AutoCAD format upon request for use in developing backgrounds for specified graphic screens, such as floor plans and schematics. However the Owner does not guarantee the suitability of these drawings for the Contractor's purpose.
- (e) Building Homepage and Floor Plan Graphic Displays
1. Building homepage background shall be a building footprint, approximately to scale, oriented as shown on the architectural drawings. Include links to each system and to the summary graphics described below.

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2. Floor plan graphics shall show heating and cooling zones, one for each fan-coil, throughout the buildings in a range of colors, which provide a visual display of temperature relative to their respective setpoints. The colors shall be updated dynamically as a zone's actual comfort condition changes. In each zone, provide links to associated terminal equipment.
3. If multiple floor plans are necessary to show all areas, provide a graphic building key plan. Use elevation views or plan views as necessary to graphically indicate the location of all of the larger scale floor plans. Link graphic building key plan to larger scale partial floor plans. Provide links from each larger scale graphic floor plan screen to the building key plan and to each of the other graphic floor plan screens.
4. Each equipment floor/area plan:
 - Controlled/monitored equipment
 - To scale, with links to graphics of all EMCS
 - The ERV and VRF condensing units (roof graphic) and each VRF evaporator (1st floor graphic)
 - Each fan-coil unit will include a link to its associated VRF system where applicable and to floor plan where fan-coil is located
5. On floor plan displays:
 - The on-floor plan display will include one Zone Area per VRF system. For example, the Main Common Area shall be separated into two Zone Areas since it is served by two VRF systems. The Zone Areas shall be reasonably delineated based on fan-coil location.
 - Respective fan-coil units shall be displayed in their respective Zone areas.
 - On floor plan displays of space temperatures shall be graphically displayed by coloring the Zone Area in accordance with or similar to the following:

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- Red: space temperature above cooling setpoint by 3°F (adjustable) or more. This condition can be programmed to generate an alarm.
 - Yellow: space temperature between cooling setpoint and 3°F (adjustable) above setpoint.
 - Green: space temperature between cooling and heating setpoints and space is in occupied mode.
 - Gray: space temperature between cooling and heating setpoints and space is in unoccupied mode.
 - Light blue: space temperature between heating setpoint and 3°F (adjustable) below setpoint.
 - Dark blue: space temperature below heating setpoint by 3°F (adjustable) or more. This condition can be programmed to generate an alarm.
- (f) Graphics shall include links to:
- AS-BUILT control drawings
 - Sequence of operation pages
 - DDC communication riser
 - Service vender information
- (g) Alarms: Each programmed alarm shall appear on at least one graphic screen. In general, alarms shall be displayed on the graphic system schematic screen for the system that the alarm is associated with (for example, temperature alarm shall be shown on graphic VRF system schematic screen). For all graphic screens, display values that are in a Level 1 or 2 condition in a red color, Level 3 and higher alarm condition in a blue color, and normal (no alarm) condition in a neutral color (black or white).

ERV System Alarms

- Filter Alarm
- ERV off, but sched on
- Supply and Exhaust Air Flow Proving Alarm
- Supply temp of ERV +/- 5F of setpoint (adjustable)
- Zone setpoints +/- 3F of setpoint (adjustable)
- Restroom Fan off

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VRF System Alarms

- Indoor Unit Alarm (each fan-coil unit)
- Filter Alarm
- Zone call for cooling/heating but condenser off/off
- Zone setpoints +/- ?F of setpoint
- Restroom Fan off

G. Phasing Schedule

(1) Based on the scope of work and schedule, it is possible that the project will need to be phased. Following the Joint Scoping Meeting, the Contractor and County Project Manager will determine project phasing. The following list is a suggested phasing breakout in the event a phased installation is required.

- (a) Variable Refrigerant Flow System 1
- (b) Variable Refrigerant Flow System 2
- (c) Variable Refrigerant Flow System 3
- (d) Variable Refrigerant Flow System 4
- (e) Variable Refrigerant Flow System 5
- (f) Variable Refrigerant Flow System 6
- (g) Variable Refrigerant Flow System 2
- (h) Bathroom ADA Upgrade
- (i) ERV and Ventilation System
- (j) Kitchen Ventilation System

Regardless of whether construction is phased or not, all construction must end prior to June 1.

- (2) If phased, the “Start” date will indicate the date that work is to begin on the identified milestone. For each milestone, the “Complete” dates will indicate that the following must be complete:
- (a) The entire scope of work for the milestone work must be complete, including all utility work up to the building and all final termination and operation of all building systems.
 - (b) Fire alarm, telephone, data, public address and all other systems final connections must be complete and systems programmed and tested so that fully functional systems are provided.
 - (c) All punch list work must be complete.
 - (d) All required testing must be complete.

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H. General requirements of this section apply to all work covered in this contract:

- (1) Where conflicts occur between the Owner's provided designs, manufacturer's specifications and regulatory requirements, the most stringent criteria shall be used. Installation shall comply with all applicable Local and State Building Codes, International Building Code, International Energy Code and International Plumbing Code.
- (2) The Contractor shall provide all field measurements and verification of existing conditions necessary to layout and provide all labor, materials, equipment, and supervision necessary to complete the work as described in the Scope of Work.
- (3) Areas shall be scanned and inspected prior to any coring, drilling, anchoring, and or cutting to identify all unknown material, piping, and conductors, installation of rooftop equipment, support dunnage, and all piping supports and anchors.
- (4) The Contractor shall provide a Construction IAQ plan per Document 01 35 23 Construction IAQ Management included with the scope of work.
- (5) The facility may be occupied during some or all of the construction period and work is expected to be completed during the normal business hours of: 8:00 AM to 5:00 PM.

During Normal Business Hours, the spaces listed below **will not** be available at the times specified.

- (a) Men's and Women's Dorms: Every day from 12:00 PM to 1:00 PM; and all day every Wednesday.
- (b) Kitchen and Refrigerator Room: Every day, except Friday's after 1:00 PM (i.e. these rooms will only be available on Friday afternoons)
- (c) Main Common/Dining Area: Every day between 11:30 AM and 1:30 PM

The Contractor must receive approval to perform work outside of normal business hours and the times specified above.

- (6) Coordinate all work and shutdowns with the Owner representative at least THREE (3) working days in advance of shutdown. All shutdowns shall not interrupt facility operations. **DO NOT PROCEED WITH ANY**

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INTERRUPTION TO FACILITY POWER WITHOUT OWNER'S WRITTEN PERMISSION/AUTHORIZATION.

- (7) Where roofing modification and work is required, prepare the existing roof for the project, make roof penetrations, install support mounts, seal roof at penetration points, flash and seal all roof mounts by approved roofing contractor to Maintain Existing Roofing Warrantee. All roofing work requires approval from the existing roof manufacturer's representative. Acceptance of this work is complete when the roofing material has been installed, the roof sealed and tested for leaks where applicable, and work has been approved by the existing roof manufacturer's representative to maintain existing roofing warrantee. All surface-mounted rooftop-piping supports shall be approved for use on roofing membrane.
- (8) Contractor will be responsible for any ceiling and roof patching required due to demolition of mechanical equipment. Contractor to submit documents showing repair design before performing the work.
- (9) Where necessary, contractor shall raise all unit curbs as required, to meet the flashing height required to maintain manufacturer's roof warranty. All electrical disconnects and connections required, shall be the contractors responsibility.
- (10) The Fire Life Safety system in the building was recently upgraded. Contractor is responsible for any new modifications required to the existing Fire Life Safety system as a result of modification of HVAC system including but not limited to demolition or new installation. Contractor will be responsible for all permits, test and inspection required in the project.
- (11) Contractor shall be responsible for all start-up, testing and commissioning of all new work defined in the summary of work. Commissioning shall be completed per manufacturers' specifications and include sign-off on installation and testing from a certified local vendor.
- (12) Contractor shall seal existing natural gas piping six inches above roofing material.
- (13) Contractor shall refurbish the existing drains and components to be used by properly preparing, insuring all components are clean and free of all foreign debris and surface rust. All drain components must be prime painted with a rust inhibitor primer and then painted with a safety yellow

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rust prohibitive paint. If the existing drains cannot be refurbished, contractor shall replace any damaged clamping rings, clamping ring bolts, drain strainers and or any missing drain components with all cast iron products. **The use of Retro-fit drains and or drain inserts are unacceptable.**

- (14) Provide at least EIGHT (8) hours of training to cover all aspects of operational and maintenance of the new system. Training shall be scheduled over TWO (2) days and include class time and field time to adequately train facility personnel on the safe operation and maintenance of all equipment and controls. All training shall be submitted to the Owner for review and approval.
- (15) Contractor shall provide AS-BUILT drawings for the mechanical, plumbing and electrical systems as well as the DDC controls installed.

Brief Scope of Work Continues...

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The following items detail the scope of work as discussed at the site. All requirements necessary to accomplish the items set forth below shall be considered part of this scope of work: