

Statement of Work

PROJECT TITLE: Split Ductless Air Conditioning (AC) Systems for Research Area

PROJECT LOCATION: Rooms 100-E4-212, 100-F4-220 and 100-F4-211, Fourth Floor, Building 100
Rooms 101-A4-231, 101-B4-125, 101-B4-200, and 101-C4-140/160, Fourth Floor, Building 101
3801 Miranda Avenue, Palo Alto, California
Veterans Affairs Palo Alto Health Care System (VAPAHCS)

PROJECT NO. 640-13-123P

DATE: May 29, 2013

EXECUTIVE SUMMARY: Provide new split ductless air conditioning (AC) systems for research areas, fourth floor at Building 100 and 101. Provide new electrical transformer, circuit breaker panel, piping system, plumbing, and controls. Electrical power shall tie to emergency circuit. See Section 3 for detail scope of work.

PROJECT SCHEDULE: Complete work including field investigation, submittals, shop drawings, construction, inspection, construction touch-up, start-up, commissioning, training, and project deliverables for this project within 100 calendar days from "Notice to Proceed".

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- 1 **BACKGROUND:** There are several freezers and refrigerators in the research areas. In order to avoid these freezers and refrigerators turn off, the research areas must maintain room temperature below 78 degree F.
- 2 **PROPOSED SOLUTIONS:** The new split ductless air conditioning (AC) systems will be provided to circulate the conditioned air in research areas. Emergency electrical power will be supplied to the systems. The systems will deliver cooling capacity to the research areas and maintain room temperature at or below 78 degree F with all windows and doors are closed when the normal heating, ventilation, and air conditioning (HVAC) system turns off due to maintenance or power outage. The systems will also serve as supplementary cooling when the room temperature is above 78 degree F with normal operation of HVAC. The room temperature set point can be field adjusted down to 72 Degree F.
- 3 **SYSTEM SEQUENCE OF OPERATION:** A single electrical power will be supplied to each split ductless air conditioning (AC) system. The AC system will consist of outdoor condenser, indoor evaporator, integrated condensate pump and associated components. Each indoor evaporator has a built-in temperature sensor and is preset at 72 Degree F as room temperature set point by manufacturer. The room temperature set point can be field adjusted through a remote or wired thermostat. An integrated condensate pump will be interlocked with the indoor evaporator.
 - 3.1 During Normal Operation: When the AC system is selected in auto operation, the system will cool the conditioned air in the room at a regular interval to bring the room temperature to user-setting level if all windows and doors are closed. The condensate pump will operate automatically on water rise. The operator workstation is located in ECC room (EB-120) at Building 100. It is able to monitor fan status, room temperature, and condensate pump status. An alarm shall be raised at the operator workstation if the room temperature falls outside the setpoint range by 5 degree F or more for 3 minutes (time period can be adjusted by user). In addition, an alarm signal shall be raised at the operator workstation if there is a fan status failure or condensate pump status failure as sensed by the evaporator controller. Control contractor shall provide a DDC controller using electric actuation controls the indoor evaporator.
 - 3.2 After a normal power failure and existing BAS/BMS sense a failure of the normal HVAC system or the room temperature exceeds a maximum allowable limit, the indoor evaporator shall be enabled by the BAS/BMS. The AC system, including the outdoor condenser, indoor evaporator and condensate pump shall be in operation with emergency power supply.
 - 3.3 After emergency power failure, the AC system and condensate pump will automatically resume operation based on manufacturer's setting. Typically, 3 minutes resume time.
 - 3.4 Safety Feature: The DDC controller uses a current transducer to monitor the evaporator fan status. When fan status is not matching the command state, an alarm is generated at the operator's workstation and the evaporator is commanded off.

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- 4 SCOPE OF WORK:** Provide all labor, materials, equipment, transportation, supervision, field investigation, shop drawings, electrical power, controls, startup, project documentation, as-built drawings, and warranty as necessary to the installation and operation of new split air conditioning systems, including mechanical, plumbing, electrical, and control for research areas (Rooms 100-E4-212, 100-F4-220, 100-F4-211, 101-A4-231, 101-B4-125, 101-B4-200, and 101-C4-140/160) at Building 100 and 101. The work includes, but is not limited to the following:
- 4.1 Phasing Sequence: Contractor shall submit construction schedule and detail phasing sequence description or action plan that shall describe, but be not limited to equipment installation sequence to Contracting Officer's representative (COR) for review prior to performing any works.
 - 4.2 Provide new split ductless air conditioning systems. Each system shall include, but not be limited to outdoor condenser, indoor evaporator, refrigerate gas/suction and liquid piping, condensate piping, condensate pumping kit, room thermostat, and auxiliary. Field verify locations for the systems. See AC system design data on design drawing. Contractor shall select condensate pump based on the AC system capacity, field measured head requirement and available operating voltage.
 - 4.3 Provide new pre-fabricated support frame to pre-mounted outdoor condenser(s) and disconnect switches with isolation pads on the roof. Provide weatherproof, permanent and heavy duty tags for outdoor equipment and disconnect switches. The background color, letter color and letter size of the tags shall match existing equipment and disconnect switch that are tied to emergency circuit.
 - 4.4 Provide new outdoor 120/208 Volt transformer and outdoor circuit breaker panel for Building 100. These components shall be NEMA 3R rated and shall match existing transformer and circuit breaker panel. The equipment shall be tagged with weatherproof, permanent and heavy duty type tags. The background color, letter color and letter size of the tags shall match existing emergency panel and transformer.
 - 4.5 Provide piping supports for refrigerate gas piping and refrigerant liquid piping on the roof and above ceiling area.
 - 4.6 Provide piping insulations for gas and liquid piping on the roof area and fourth floor ceiling area.
 - 4.7 Patch and seal the roof opening for the electrical conduit and piping.
 - 4.8 Provide wall-mounted indoor evaporators and install per manufacturer's installation instructions. Provide integrated condensate pumps with drain pan, covers and auxiliary material. Contractor shall perform field verification and pipe condensate from the discharge of the condensate pump to existing nearby floor drain that is tied to existing sanitary sewer system. The new condensate pump shall include normal open (NO) and normal close (NC) contacts for overflow alarm. Wire NO and NC contacts to existing Building Automation System/Building

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Management System (BAS/BMS) in ECC room (EB-120) at Building 100.
Integrate and program the signal to the existing BAS/BMS.

- 4.9 Contractor shall conduct field load monitoring on the existing emergency panels for at least 30 consecutive days to determine if the panels have adequate capacity to feed new loads. Calculate total demand load including the new load per NEC. Submit reports to VA for review and approval. Provide shop drawings to show the complete wiring diagrams and indicate which panels to be connected. The following proposed emergency panels shall be field verified by Contractor.
- 4.9.1 Building 100: Panels 100-QHD51A (277/480V, 3-PH, 4W, 800A) and 100-QHD53C (277/480V, 3-PH, 4W, 800A).
- 4.9.2 Building 101: Panels 101-EL41A-2 (120/208V, 3-PH, 4W, 300A) and 101-ELX42B (120/208, 3-PH, 4W, 100A).
- 4.10 Re-wire electrical power of an existing 5-ton split air conditioning system that serves research room (101-F4-221) to emergency circuit. The existing system requires 460 Volt, 3-phase and maximum 15 amps circuit breaker.
- 4.11 The electrical power shall come from emergency circuit. Locate the disconnect switches to allow operator access and meet the latest edition of NFPA 70 National Electrical Code (NEC) service clearance requirement. Electrical contractor shall provide circuit breakers, NEMA 3R rated, non-fused disconnect switches, electrical wiring, conduits, and auxiliary components in accordance with the latest edition of NFPA 70, NEC and applicable Federal codes, VA design standards, and industry standards. Apply safety factors on wiring per NEC. Provide new breakers to match existing type of breakers.
- 4.12 Electrical contractor shall provide complete shop drawings to show all electrical works to VA for review and approval. Electrical contractor shall submit the as-built shop drawings as part of deliverables to the COR after the electrical work is complete.
- 4.13 Contractor shall submit emergency power shutdown request(s) in writing, at least 30 calendar days in advance of proposed time and shall be performed as directed by the COR. If the shutdown period will be more than 2 hours, provide backup generator.
- 4.14 Contractor shall coordinate with control contractor who shall provide all necessary room thermostat, control devices, materials, wiring, and software programming to integral and program the control signals from the new AC systems and new condensate pumps to the existing BAS/BMS. Control contractor shall submit complete functional and operational control shop drawings, control sequence of operation and control components submittals to VA for review and approval.
- 4.15 Provide piping pressure leak test, equipment startup and training. Contractor shall submit the final piping pressure leak test report and equipment startup reports to VA for review.

5 DELIVERABLES

- 5.1 At the pre-con, Contractor shall provide a baseline project schedule with adequate detail of construction activities, including construction phasing.
- 5.2 Shop Drawings: The design drawings are only conceptual drawings for this contract. Contractor shall perform field measurement and provide final construction shop drawings. Submit 100% complete set of 24 x 36 inch construction drawings along with Compact Disks (CDs) before starting the construction. The shop drawings shall indicate the tie-in locations, new piping layout, equipment layout, isometric view, bill of materials, and other information required to fully describe the items being installed. The 100% shop drawings will be used for the Government to check installation for compliance with the design as provided by the licensed Contractor. The drawings shall be provided in AutoCad file format. AutoCad files shall follow VHA National CAD Standard Application Guide.
- 5.3 Catalog Cuts: Catalog cuts shall contain manufacturer's description, specifications and sketches of the material and equipment provided. The catalog cut shall contain sufficient information which can be used to determine compliance with these specifications.
- 5.4 As-Built Drawings: Contractor shall provide labor and perform final installation verification along with the COR. Contractor shall update the construction drawings and provide as-built drawings in AutoCad and pdf file formats. Besides four (4) sets of as-built drawings hard copies (24 x 36 inch), provide complete set of CD Rom disks of as-built drawings in AutoCad (in no earlier version than 2000) and pdf file formats. AutoCad files shall follow VHA National CAD Standard Application Guide.
- 5.5 Operation and Maintenance Manual: (four copies each) for each separate piece of equipment shall be delivered to the Contracting Officer's representative coincidental with the delivery of the equipment to the job site. Manuals shall be complete, detailed guides for the maintenance and operation of equipment. They shall include complete information necessary for startup, adjusting, maintaining in continuous operation for long periods of time and dismantling and reassembling of the complete units and sub-assembly components. Manuals shall include an index covering all components parts clearly cross-referenced to diagrams and illustrations. Illustrations shall include "exploded" views showing and identifying each separate item. Emphasis shall be placed on the use of special tools and instruments. The function of each piece of equipment, component, accessory, and control shall be clearly and thoroughly explained. All necessary precautions for the operation of the equipment and the reason for each precaution shall be clearly set forth. Manuals must reference the exact model, style and size of the piece of equipment and system being furnished. Manuals referencing equipment similar to but of a different model, style, and size than that furnished will not be accepted.
- 5.6 Test Results: Submit test results as described in the scope of work and individual referencing specification section. Submit piping leak test and equipment startup reports.

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- 5.7 Instruction/Training: Contractor shall furnish the services of a competent instructor to give full instruction to VA's HVAC maintenance and operational personnel in the adjustment, operation, and maintenance, including pertinent safety requirements, of the Re-circulating water heating system. Instruction shall be provided for minimum of four (4) hours.
- 5.8 Standard Compliance: When materials or equipment must conform to the standards of organizations such as the American Society for Mechanical Engineering (ASME), the American Society of Safety Engineers (ASSE), the American Society for Testing and Materials (ASTM), and Underwriters Laboratories (UL), proof of such conformance shall be submitted to the Contracting Officer's representative for approval. If an organization uses a label or listing to indicate compliance with a particular standard, the label or listing will be acceptable evidence. In lieu of the label or listing, submit a certificate from an independent testing organization, which is competent to perform the test. The certificate shall state that the item has been tested in accordance with the specified organization's standard.
- 6 **TECHNICAL SPECIFICATIONS:** The work shall conform to the attached specifications sections (as applicable) listed below, which form a part of these specifications and scope. The specification sections are:

SECTION 01 00 00 GENERAL REQUIREMENTS

SECTION 01 33 23 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

SECTION 01 74 19 CONSTRUCTION WASTE MANAGEMENT

SECTION 07 84 00 FIRESTOPPING

SECTION 07 92 00 JOINT SEALANTS

SECTION 13 05 41 SEISMIC RESTRAINT REQUIREMENTS FOR NON-STRUCTURAL COMPONENTS

SECTION 23 05 11 COMMON WORK RESULTS FOR HVAC

SECTION 23 23 00 REFRIGERANT PIPING

SECTION 23 81 43 SPLIT DUCTLESS AIR CONDITIONING SYSTEM

SECTION 26 05 11 REQUIREMENTS FOR ELECTRICAL INSTALLATIONS

SECTION 26 05 19 LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

SECTION 26 05 26 GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

SECTION 26 05 33 RACEWAY AND BOXES

SECTION 26 22 00 LOW-VOLTAGE TRANSFORMERS

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NOTE: For other related specification sections (not included above, but are required to accomplish the project) follow applicable specification sections of, VA master specs.

Its web site is <http://www.cfm.va.gov/TIL/spec.asp>

- 7 REGULATIONS:** All construction work shall meet the latest edition of VA design manuals, VA master specs, VA Standard, NFPA, ASHRAE, SMACNA, NEC, ADA, federal, state, local codes and regulations, and all other applicable codes.

- 8 CONCEPTUAL DESIGN DRAWINGS:** The drawings listed below are included for conceptual only.

Drawing #	Drawing Title
GI-001	Vicinity Map, Location Maps, Legend, Drawing Index, Work Summary, and Schedule
MP-101	HVAC Construction on Roof and Fourth Floor Bldg. 100
MP-102	HVAC Construction on Roof and Fourth Floor Bldg. 101
MP-601	Conceptual Split Ductless Air Conditioning System Diagram and Control Network Diagram

- 9 REFERENCE DRAWINGS:** The drawings listed below are included for reference only. They are known not to accurately reflect all existing conditions. Field verify all necessary information.

Drawing #	Drawing Title
100-H2.4.0	Fourth Floor Key Plan, Air Handling Units Zoning
100-H2.4.1A	Fourth Floor Plan, Area A - Ductwork
100-H2.4.2A	Fourth Floor Plan, Area A - Piping
100-H2.4.1C	Fourth Floor Plan, Area C - Ductwork
100-H2.4.2C	Fourth Floor Plan, Area C - Piping
100-H2.5.1A	Fifth Floor/Roof Plan, Area A - Ductwork
100-H2.5.1C	Fifth Floor/Roof Plan, Area C - Ductwork
101-H2.4.1A	Fourth Floor Plan, Area A - Ductwork
101-H2.4.2A	Fourth Floor Plan, Area A - Piping
101-H2.5.1A	Fifth Floor/Roof Plan, Area A - Ductwork

- 10 LIAISON:** The technical project point of contact (POC) is Karen Lee at (650) 650-5000, ext. 67322 or Mr. Mark Keeth at (650) 650-5000, ext. 65225.

- 11 SITE VISIT:** Investigate the site per FAR 52.236-3 to ascertain the general and local conditions which can affect the work or its cost. Access to the site will be available during normal working hours. Contact Mr. Mark Keeth at (650) 650-5000, ext. 65225 to arrange site access.
- 12 CONTRACTOR SECURITY REQUIREMENTS:** At no time will the vendor be in contact or have access to VA sensitive information. VA sensitive information procedures will be followed per VA Handbook 6500.6. The Contractor will adhere to VAAR 852.252-75, Security Requirements for Unclassified Information Technology Resources (Interim-October 2010).
- 13 CONTINUITY OF STATION OPERAITON:** Schedule work to minimize interference with the facilities' normal operations. Perform all on-site work between the hours of 7:30 AM and 4:30 PM ("regular hours"), Monday through Friday (Federal Holidays excluded). Shutdowns, final connection works, and system startup are required to be performed during weekends, Federal holidays, or off hours unless instructed, otherwise without any extra premium. Comply with "Rules of the Station" and infection control risk assessment (ICRA) requirements.
- 14 RECYCLING AND DISPOSAL OF REFUSE:** Refuse, excess or waste materials resulting from construction operations shall become the property of the Contractor and shall be recycled and/or disposed of off Government property. All disposals shall be done in accordance with federal, state, and local laws and regulations and as specified in Section 01 74 19.
- 15 WARRANTY:** Provide manufacturer's standard warranty for the split ductless AC systems. Contractor shall provide labor and materials for 12-month warranty from the date of acceptance.

END OF SECTION