

STATEMENT OF WORK TO CONSTRUCT A SCANNER AREA

1.0 SCOPE

1.1 Scope. This statement of work requires complete turnkey services to completely renovate and remodel a couple of existing rooms into one room, new scanner room, that shall meet new stringent room requirements (herein referred to as SARS). The SARS site for this statement of work (i.e., SOW617WFD5775) are located in and immediately outside the existing developer room of Building 137 at the Fleet Readiness Center (FRC) East, MCAS Cherry Point, NC. All equipment specified herein shall be installed and/or removed at FRC East, MCAS Cherry Point, NC.

2.0 APPLICABLE DOCUMENTS

2.1 Government documents. The following documents, of the issue in effect on date of invitation for bids or request for proposals, form a part of the specification to the extent specified herein. Documents listed below are referenced in the specification by alphanumeric code only. Copies of these documents can be obtained from the publication sources listed in section 5.1.

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

40 CFR Part 82	EPA Regulations on the Protection of Stratospheric Ozone
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U.S. DEPARTMENT OF LABOR, OCCUPATIONAL, SAFETY, AND HEALTH ADMINISTRATION (OHSA)

29 CFR 1910.147	The Control of Hazardous Energy (lockout/tagout)
29 CFR 1910.332	Electrical – Safety – Related work practices

(Application for copies should be addressed to Superintendent of Documents, Government Printing Office, Washington, DC 20402-0001).

DEPARTMENT OF DEFENSE (DoD)

UFC 1-200-01	Unified Facilities Criteria (UFC)
OPNAVINST 5100.23.G, Chap 18	Navy Occupational Safety and Health Program Manual, “Hearing Conseration and Noise Abatement”
OPNAVINST 5100.23.G, Chap 24	Navy Occupational Safety and Health Program Manual, “Energy Control Program (Lockout / Tagout)”
OPNAVINST 5100.23G, Chap 30	Navy Occupational Safety and Health Program Manual, “Indoor Air Quality Management”
OPNAVINST 5090.1B, Chap 6	Environmental and Natural Resources Program Manual

(The Naval Facilities Engineering Command Unified Facilities Guide Specifications and the Military Handbook are Available from the Atlantic Division, Naval Facilities Engineering Command Web Site. Application copies of the OPNAVINST should be addressed to the Office of the Chief of Naval Operations, The Pentagon, Washington, DC 20350-2000).

NAVAL AIR DEPOT, CHERRY POINT, NC (FRC East)

NADEP DSPM	NADEP Drawings Standards and practices Manual (DSPM) for the Industrial Production and Planning Division 6.3.1
NADEP CNC	NADEP Controls Naming Convention (CNC)

FRC EAST PURCHASE DESCRIPTION

PD617WFD5775.1	800-1200 CFM Precision Humidity and Temperature Conditioner (enclosed for roof mount)
PD617WFD5775.2	HygroClip
PD617WFD5775.3	SmartPad Controller

FRC EAST DRAWING

PE – 20555F	Modifications for Kartoscan FB V FRC East, Cherry Point, NC [sheet 1 = REV. C, sheet 2 = REV. C]
PE – 20555M	Installation of Kartoscan FB V (Graphic Arts) FRC EAST, Cherry Point, NC [sheet 1 = REV. B, sheet 2 = REV. B, sheet 3 = REV. A, sheet 4 = REV. B, sheet 5 = REV. B, sheet 6 = No REV., sheet 7 = No REV.]
PE – 20555P	Preparation for Kartoscan FB V (Electrical Demo & New Work) FRC East, Cherry Point, NC [All sheets (1-5) = REV. B]

(Requests for copies should be addressed to Attn: Kenneth Mckinney (252-464-5329), Code 6.3.1, FRC East, PSC Box 8021, Cherry Point, North Carolina, 28533.)

2.2 Non - Government documents. The following documents (i.e., most recent versions), of the issue in effect on date of invitation for bids or request for proposal, form a part of the specification to the extent specified herein. Documents listed below are referenced in the specification by alphanumeric code only. Copies of these documents can be obtained from the publication sources listed in section 5.1.

INTERNATIONAL CODE COUNCIL (ICC)

IBC 2003	International Building Code 2003
IMC 2000	International Mechanical Code 2000
IPC 2000	International Plumbing Code 2000

(Applications for copies should be addressed to International Code Council, 5203 Leesburg Pike, Suite 708, Falls Church, Virginia, 22041-3401)

AMERICAN SOCIETY OF HEATING, REFRIGERATION AND AIR CONDITIONING ENGINEERS
(ASHRAE)

ASHRAE HANDBOOK, FUNDAMENTALS

ASHRAE 90.1 Energy Standard for Buildings Except
Low-Rise Residential Buildings

ASHRAE AIR-CONDITIONING SYSTEM
DESIGN MANUAL

(Application for copies should be addressed to the American Society of Civil Engineers, 1801 Alexander Bell Drive, Reston, VA 20191).

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70 National Electric Code
NFPA 72 National Fire Alarm Code
NFPA 79 Electrical Standard for Industrial Machinery
NFPA 90A Installation of Air Conditioning and Ventilating
Systems

(Application for copies should be addressed to the National Fire Protection Association, 11 Tracy Drive, Avon, MA 02322).

ASSOCIATED AIR BALANCE COUNCIL (AABC)

AABC Test and Balance Reports

(Applications for copies should be addressed to the Associated Air Balance Council 1518 K Street NW, Washington, DC 20005)

NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB)

NEBB Test and Balance Reports

(Applications for copies should be addressed to the National Environmental Balancing Bureau, 8575 Grovemont Circle, Gaithersburg, MD 20877)

PYRAMID ENVIRONMENTAL ENGINEERING, P.C

Project 2011-158 Lead, Paint and Abestos Survey (prepared by Brett Higgins)

(Applications for copies should be addressed to Pyramid Environmental Engineering P.C., 503 Industrial Avenue, Greensboro, North Carolina, 27406)

2.2.1 Standards.

ANSI/ASQC D1160 American National Standard for Formal Design Review

ASME B31.9 ASME Building Services Piping

UFGS – 23 05 93 NAVFAC Unified Facilities Guide Specifications – (Testing, Adjusting, and Balancing for HVAC)

UFGS – 23 07 00 NAVFAC Unified Facilities Guide Specifications – (Thermal Insulation For Mechanical Systems)

EM 385-1-1 U.S. Army Corps of Engineers, Safety and Health Requirements Manual

2.3 Order of Precedence. In the event of a conflict between the text of this specification and the references cited herein (except for associated detail specifications, specification sheets, or MS standards), the text of this specification shall take precedence. However, this specification shall not supersede applicable laws and regulations unless a specific exemption has been obtained.

3.0 REQUIREMENTS

3.1 General information and coverage. All equipment specified herein shall be installed at FRC East, MCAS Cherry Point, NC. The equipment provided shall be the manufacturer's current production model, new and unused, capable of performing its intended function in accordance with the operation and performance requirements of this specification. The equipment shall form a complete system so that when connected to the utilities identified herein, it can be used for all functions for which it is designed and constructed.

3.1.1 Critical parameters definition. The following objectives of the SARS system shall be accomplished by this

- a. This statement of work includes all parts of purchase descriptions PD617WFD5775.1, PD617WFD5775.2, PD617WFD5775.3 and drawings: PE-20555F, PE-20555M, PE-20555P. With the understanding, that this statement of work may state additional work that may add, modify, or amend work stated in any one or all of the subject documents (i.e., PD617WFD5775.1, PD617WFD5775.2, PD617WFD5775.3, PE-20555F, PE-20555M, PE-20555P).
- b. Per PD617WFD5775.1 and this SOW617WFD5775 the new scanner room shall be held at a constant temperature in degrees Fahrenheit with a single point control constancy of $\pm 0.2^{\circ} C$ and 50 % \pm 0.5% relative humidity.
- c. The following work shall be completed by contractor when required per contract in order to support and complete all three purchase descriptions PD617WFD5775.1, PD617WFD5775.2, PD617WFD5775.3 documents:
 - (1) Per manufacturers instructions, drawing PE-20555M and this SOW617WFD5775, the contractor shall provide and install all roof penetrations for all duct work (i.e., supply and return ducts) required for PD617WFD5775.1.
 - (2) Per manufacturers instructions, drawing PE-20555M and this SOW617WFD5775, the contractor shall provide and install all roof curbing details for the subject equipment. The roof curbing shall be made to fit (i.e., acceptable fit tolerance = $\pm 1/2''$) the subject equipment stated in PD617WFD5775.1.

- (3) Per manufacturers instructions, drawing PE-20555M and this SOW617WFD5775, the contractor shall provide all labor, materials, lifting devices, supervision, and engineering support to locate, lift, set and secure subject conditioner (i.e., per PD617WFD5775) permanently on the contractor constructed roof curb.
- (4) Per manufacturers instructions, drawing PE-20555M and this SOW617WFD5775, the contractor shall run all main electrical which includes low voltage control wiring between conditioner and controller for PD617WFD5775.1. The original equipment manufacturer of the conditioner (HVAC unit) shall supply the wire and shall make final connections.
- (5) Per manufacture instructions and PE-20555M, the contractor shall provide all required material, labor, supervision, engineering, piping, fittings and valves required to fully connect the designated ½” water line shown in drawing PE-20555M reference detail B 2 4 on sheet 4 of drawing PE-20555M directly to the roof mounted conditioner at the water filter connection. Prior to making any connections, the contractor shall replace the existing shut off valve shown in the detail B 2 4 on sheet 4 of drawing PE-20555M with a new matching valve. The supplied water line shall be insulated with the required heat trace to prevent the water from freezing. In addition, a Government approved backflow prevention assembly (i.e., approved by USC FCCC HR) shall be selected and properly installed, by the Contractor, in the existing water line that feeds the conditioning unit. NOTE: Approved Backflow Prevention Assemblies shall meet American Society of Sanitary Engineering (ASSE) standard and also carry an ASSE seal OR is on the University of Southern California (USC) approval list. In addition, Backflow prevention (BFP) assemblies shall be installed in a place where it is readily accessible for regular testing, maintenance, and inspection. Bypass lines parallel to a BFP assembly shall have an approved BFP assembly installed that is equal to that on the main line.
- (6) Per manufacture instructions and drawing PE-20555M, the contractor shall provide and install the required condensate drain line and the all required accessories (i.e., fittings, pump, etc.) from the subject roof mounted conditioner to the closest roof drain.

d. The Contractor shall install a foundation per scanner manufacturer requirements that shall meet all required manufacture tolerances and specifications that are stated by scanner manufacture and are shown in the following documents: Gefoto Scandinavia, drawings (PE-20555F, PE-20555M) and the installation document titled “Delivery item 2: Installation Requirements Document – Contract no: M00146-09-P-9003” (document dated: October 28, 2009). All foundation work shall be done between 5 pm EST and 11:00 pm EST and approved, in writing, by the Government. At no time shall construction be active without proper protective barrier and guides in place to protect and shield construction work from and protect the surrounding public and the surrounding environment from dust, dirt and other byproducts of construction site. In addition, proper dust suppression by water or other effective methods shall be used during any concrete demolition work. Gasoline powered equipment cannot be operated inside any buildings unless there is no alternative, in which case the Contractor shall develop a written exposure control plan to be submitted to the FRC East Safety office for approval.

(1)) Soil removal / testing required for scanner foundation. This project location is in an area that has a history of major POL or chemical spills. Pre-characterization or soil sampling is not required prior to excavation. This information is provided to give the contractor’s Industrial Hygiene Department for incorporation into their Health and Safety Plan to ensure worker safety. If any soil which exhibits an abnormal or unnatural color, a chemical or petroleum odor, or is saturated with a chemical or petroleum is encountered during excavation, work should be immediately stopped in that area, and the Environmental Affairs Department (EAD) should be advised of the situation so a course of action can be developed to address the contamination. All excavated soil may be re-utilized as backfill at the same location from which it was removed unless petroleum contamination is discovered. If petroleum contamination is discovered, the soil shall be segregated by PID (\geq 10 ppm or exhibits staining), properly stockpiled, tested and disposed. If soil is to be stockpiled, then it shall be stockpiled on plastic, bermed, and covered in accordance with NC DENR Groundwater Section Guidelines for the Investigation and Remediation of Soil and Groundwater, Volume 1 dated July 2000 (Guidelines), or placed in a roll off container and covered in plastic. For this site within the OU-1 boundary, the excess soil that cannot be re-utilized as backfill at the same location from which it was removed must be disposed at a Subtitle D landfill as a minimum with the understanding that the analytical testing results will determine the final disposal facility. Contractor shall provide supporting laboratory analysis to the EAD for review. The EAD must review and sign the waste manifests/bill of lading for the

soil disposal prior to any of this soil leaving the FRC East (i.e., Air Station). The manifest should also contain the amount of soil (weight) and supporting laboratory results for EAD review. One composite sample must be taken and analyzed for each 200 cubic yards of the stockpile per DENR Guidelines in order to determine the proper method of disposal. Use of a North Carolina certified laboratory to perform the specific soil analyses shall be required. The laboratory shall be certified by North Carolina in the specific tests to be performed. Consult with the selected laboratory about the specific sample handling procedures required by the analytical methods. Sample containers, volumes, procedures and preservation vary among methods. Sampling shall be conducted by qualified personnel and proper chain of custody protocol shall be followed. The stockpile sample(s) shall be analyzed for the following:

Std Method 5030 sample prep with Modified 8015 (CA GC-FID Method) – Gasoline Range Organics, (GRO)

Std Method 5030 and 3550 sample prep with Modified 8015 – Diesel Range Organics, (DRO)

EPA Method 9071 – Oil & Grease and

Full TCLP

All disturbed areas shall be capped by either (1) covering the surficial soil with an impervious material such as concrete or asphalt, or (2) topping the excavated area with 12 inches of compacted, clean fill. Capping is required to prevent an increased exposure risk from both surficial exposure and contaminated leaching. Therefore, backfilled soils shall be compacted to minimize infiltration of surface water through the soil column. In contaminated areas, if dewatering is required during excavation, all water must be containerized. The groundwater shall not be discharged to the ground surface, storm sewer, etc. prior sampling and analysis due to the potential contamination from migrating plumes. FACENG/ROICC may make arrangements with the IWTP for disposal of contaminated groundwater. If groundwater is accepted for disposal by the IWTP, then sampling may not be required (water disposal of at IWTP, historically has not required testing). A chit must be obtained from EAD (Timothy Lawrence, 252-466-2754) prior to sending contaminated water to the IWTP. If additional assistance is required please contact Stan C. Kegley, Environmental Affairs Department, @ 252-466-4674; e-mail – Stanley.Kegley@USMC.mil. Do not furnish or transport soils onto the MCAS Cherry Point when such act would violate the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) or the General Statutes of North Carolina. The contractor shall be responsible for the removal of all soil. Additionally, the Contractor shall be responsible for testing the soil for contamination. If contamination exists, the contractor shall have the soil removed by contractors qualified to dispose of contaminated soil. Removal of contaminated soil shall be an option. All soil not used as backfill shall be contained in a manner to prevent contact with storm water. The containment may be drums, metal hopper, roll off or plastic / hay bails and the containers must then be covered. The contractor will be assign a collection area for soil retention by the FRC East project manager since analytical sampling typically takes a minimum of 2 weeks. All sampling shall be at the cost of the Contractor. All sample results shall be provided to both the FRC East project manager and FRC East Environmental for review.

REQUIREMENTS FOR OFF-SITE SOIL: The contractor shall provide documentation certifying that all soil furnished under the contract contains no petroleum or hazardous or toxic materials as defined in DoD Instruction 4715.6, which implements 10 U.S.C. 2692. This documentation shall include the amount of soil needed in cubic yards, analytical test data to support the condition of the borrow pit source(s), and a certified “borrow pit” permit number. The Environmental Affairs Department (EAD) will review these documents before off site soil is considered approved for use. The following methods shall be used to determine if soil meets this standard.

If the total amount of soil to be brought onto the MCAS Cherry Point for a single contract is less than 200 cubic yards, certify the soil meets the standard by inspecting for “Apparent Contamination” (visual or other indications of contamination including abnormal or unnatural color, chemical or petroleum odors, or saturation with a chemical or petroleum). Soil which is contaminated, as determined by inspecting for “Apparent Contamination”, shall not be utilized on the MCAS Cherry Point or outlying fields.

If the soil is “Clean” on inspection, the contractor shall provide a signed document that certifies the soil meets the standard of “Not Containing Apparent Contamination” that shall be given to the EAD for off site approval. The signed document will also need to include the amount of soil (cubic yards) and a certified “borrow pit “permit number.

If the total amount of soil to be brought into the MCAS Cherry Point for a single contract is greater than 200 cubic yards, provide certification that the soil meets the standard by analytical testing performed by a laboratory. Use of a North Carolina certified laboratory to perform the specific soil analyses required. The laboratory must be certified by North Carolina in the specific tests to be performed. Consult with the selected laboratory about the specific sample handling procedures required by the analytical methods. Sample containers, volumes, procedures, and preservation vary among methods. Sampling must be conducted by qualified personnel and proper chain-of-custody protocol must be followed. Collect representative sample(s) of the soil to be used for the contract and analyze for Gasoline Range Organics (GRO), Diesel Range Organics (DRO), Oil and Grease, and 8 RCRA Metals (Totals). If any of the test results are greater than the allowed Detection Limits for petroleum, the soil from which the sample was taken shall not be certified as meeting the standard. If any test results are greater than the North Carolina soil-to-groundwater target concentrations for the 8 RCRA metals, the soil from which the sample was taken shall not be certified as meeting the standard. Metals to be tested for by TCLP are: Arsenic; Barium; Cadmium; Chromium; Lead; Mercury; Selenium; and Silver. All units are reported in mg/kg (ppm).

The sampling requirement details are summarized below. These are for a single source only.
 One representative sample for volumes 200 cubic yards to 1,000 cubic yards of soil needed.
 Five representative samples for volumes 1,000 cubic yards to 10,000 cubic yards of soil needed.
 One additional representative sample per 2,000 cubic yards for volumes over 10,000 cubic yards of soil needed. Example: 12,000 cubic yards needed, 6 representative samples tested.

A representative sample is a sample fully represents the source (borrow pit) as a whole. This can be achieved by collecting multiple samples (composite) in a defined area and allowing the laboratory to combine them into a representative sample for their analysis.

Samples should be analyzed for the following parameters with acceptable results being less than North Carolina's waste criteria (for petroleum Constituents) or soil-to-groundwater criteria (for total metals).
 Std Method 5030 sample prep with Modified 8015 (CA GC-FID Method) - Gasoline Range Organics,
 Std Method 5030 and 3550 sample prep with Modified 8015 - Diesel Range Organics,
 EPA Method 9071 - Oil & Grease, and
 TCLP for 8 RCRA Metals (D004-D011)

Total Metals (values in mg/kg)

Arsenic	Barium
Cadmium	Chromium
Lead	Mercury
Selenium	Silver

e. ADDITIVE BID ITEM: Johnson Controls will provide independent monitoring of the new scanner room (i.e., temperature, humidity, vibration of the scanner pad) that shall be connected and directly interfacing with FRC East existing Johnson Controls Metasys (FMS) system.

3.1.2 Current production model. The equipment provided by the Contractor shall be a current production model. A current production model is the manufacturer’s current production which, on the date the Contractor’s proposal, has been designed, engineered, and sold or offered for sale through advertisements or manufacturer’s published catalogs or brochures. Products such as a prototype unit, pre-production model, or a highly modified current model, where major components have been redesigned, do not qualify as meeting this requirement.

3.1.3 New Parts. New parts are parts that have never been used in any machine or process. Parts that are removed by the Contractor and replaced with a new part are the Government's property and/or designated as this specification states as disposable parts (i.e., see paragraph 3.1.5 Disposable Part(s)).

3.1.4 Reconditioned Parts. Government will not accept any reconditioned parts. Reconditioned parts are defined as parts that have been removed from the compressor, cleaned, inspected, and reworked by the Contractor to meet the original manufacturer's performance specifications.

3.1.5 Disposable Part(s). All stated items of this specification that are subject for removal shall be properly disposed of by the Contractor. Parts designated for removal shall be properly disposed of by the Contractor unless otherwise stated in this specification. The Contractor shall comply with all Federal, State and local environmental regulations. Contractor shall follow FRC EAST INSTRUCTION 5090.1H, Chapter 3 dated June 7, 2006 for appropriate spill response procedures and proper handling and disposal of hazardous waste.

3.1.6 Turnkey installation. The Contractor shall provide all materials, labor, shipping, tools, handling equipment, and supervision required to remove existing and construct, deliver, assemble, install, test, and put into operation the new and existing equipment specified herein.

3.2 Project definition. This project (SOW617WFD5775) purpose is to successfully transition from a camera developing room set up to a scanner room set up. .

3.3 Characteristics. The SARS shall meet, at a minimum, the performance and physical characteristics described in Requirement section 3.0. The Contractor shall demonstrate the following SARS performance characteristics during the acceptance test (See 4.2.4).

3.3.1 Additional Performance Requirements

3.3.1.1 Air Quality – The SARS shall introduce no material, gases, or particles, or chemically alter any materials that will adversely affect or reduce the quality of the air passing through the unit.

3.3.1.2 Electrical System. The SARS system shall be furnished complete with all accessories. The complete installation and wiring shall be in compliance with applicable requirements of NFPA 70 and NFPA 79.

3.3.1.3 Variations in System Voltage. The system including all components shall be designed to fully operate with a ± 10 percent variation in system voltage.

3.3.1.4 Line Conditioning/Voltage Transients. The system including all electronic devices shall be capable of maintaining normal operations during voltage drops to 40 percent of rated value lasting 0.1 seconds (6 cycles).

3.3.1.5 Disconnect Switches. A manually operated disconnect switch shall be provided for motor control and motor starter. The disconnect switch shall electrically isolate each motor starter and motor control for maintenance action. Each disconnect switch shall be lockable.

3.3.1.6 Wiring. All wiring, conduit, and attaching hardware shall be provided by the Contractor. All wiring shall be copper. All wiring shall be in accordance to NFPA 70.

3.3.1.7 Orderly Shutdown. An orderly shutdown of the system is required during periods where voltage conditions do not permit full system operation. System and personnel protection shall be provided when an orderly shutdown occurs. An orderly shutdown shall provide the required utilities to the control system to prevent damage. The control system shall assume a fail-safe condition. The control system shall not assume an operational status when conditions permit without operator action. All programs, setpoints, and data shall be stored in nonvolatile RAM (memory) for retention during periods of power removal.

3.3.2 Physical Characteristics.

3.3.2.1 Materials and Equipment. Materials and equipment complete with accessories shall be selected by the Contractor for performance compatibility.

3.3.2.1.1 Electrical work. All work shall be completed in strict compliance with the articles and requirements of the “National Electrical Code”, NFPA-70, Current Edition, and the “Standards For Electrical Safety in the Work Place”, NFPA—70E, Current Edition, and in strict compliance with the requirements set forth in the OSHA Standards for General Industry, current edition. In addition, all electrical work shall be completed by a contractor holding, as a minimum, a current limited electrical contractors license issued by the North Carolina Board of Examiners of Electrical Contractors in accordance with the provisions and requirements of Chapter 87, Article 4 of the General Statutes of North Carolina.

3.3.2.1.2 Measurement systems. The U.S. Customary System of Units (US) shall be used in the design and construction of the SARS. In this specification, all measurements, dimensions, sizes and capacities are given in the US system of measure.

3.3.2.1.3 Measuring and indicating device graduations. Measuring and indicating devices such as pressure and temperature gauges on the SARS shall be graduated and labeled in the US system of measurements.

3.3.2.1.4 Servicing. Routine scheduled or as required servicing of the equipment shall be accomplished in such a fashion as to not require disassembly of the equipment.

3.3.2.1.5 Accessibility. All parts subject to wear, breakage, or distortion shall be accessible for adjustment, replacement, and repair.

3.3.2.1.6 Support equipment. The Contractor shall provide all support equipment (i.e. tools, fixtures, jigs, instruments etc.) required to operate, maintain and calibrate each of the subsystems and the overall SARS components.

3.3.2.1.7 Environmental conditions. The SARS shall be so designed and constructed that, under the transportation, storage, operating, and service conditions described herein, the equipment shall not emit materials hazardous to the ecological system as prescribed by Federal, State, or local statutes in effect at the point of installation.

3.4 Design and construction.

3.4.1 Design Requirements and Criteria. The proposed layout (i.e., proposed layout is conveyed and shown in the following drawings PE-20555M, PE-20555P and PE-20555F and described in SOW617WFD5775) shall be the basis of design. Deviation from the proposed layout shall be made to the Government before proceeding.

3.4.1.1 Utility Systems. All utility system(s) (HVAC, Electrical, Plumbing, Fire Sprinkler, etc.) shall be installed in accordance with the International Code Council Codes, IBC 2003, IMC 2000, and IPC 2000, per UFC 1-200-01.

3.4.1.2 Responsibility of damages. The contractor shall be responsible for, and be required to make good at his own expense, all damages to any work or materials in place on the premises, or included in the contract, during the execution of this SOW.

3.4.1.3 Noise limitations. All systems that may affect production shop areas shall not produce noise greater than 84 dp and as listed in Chapter 18 of OPNAVINST 5100.23G.

3.4.1.4 Asbestos and lead testing requirements. Based on recent test results (reference project 2011-158, Lead, Paint and Asbestos Survey – by Pyramid Environmental Engineering, P.C.– prepared by Brett Higgins, July 25, 2011), no traces of lead were found but the existing floor was found to have asbestos. Therefore, the Contractor shall perform the required asbestos abatement to remove all asbestos from the area. The Contractor shall provide all

information on the plans (i.e., plans include detail specifics on all handling and removing of all subject materials involved) and actual process to remove asbestos in the design submittals. All subject material shall be removed by a licensed abatement contractor prior to beginning of construction. Prior to beginning of any construction, the Contractor shall notify the FRC East Safety division (Jefferson Davis, 252-464-8804) so that FRC East may document that the asbestos containing material has been removed.

3.4.1.5 Existing devices and equipment. The Contractor shall identify devices, doors, equipment, walls, ceilings, ducts, registers, floors as deficient if it is believed that the deficiency will affect operation or affect temperature and humidity. Devices that are identified as deficient shall be inspected for functionality and reported back the FRC East Project Manager if they do not operate correctly or as needed. This report shall be called a discrepancy list and indicate the operational issue with the device and recommendation for correction. The FRC East Project Manager may elect to correct or not correct the issue by issuing internal maintenance work orders.

3.4.1.6 All external portions of HVAC system. All external portions of the HVAC system including roof penetrations, curbs, flashing, and tie downs shall be designed and mounted to withstand sustained wind loads of 140 mph.

3.4.1.7 Roofing work. All roofing work shall be coordinated with the roof manufacturer and the FRC East Project Manager before modifying or altering the roof and/or installing equipment on the roof. All new roofing modifications shall be designed per manufacturer's approved roofing details and coordinated with current roof manufacturer who still has responsibility of the roof. All roofing work shall be performed by a contractor that is approved by the roofing manufacturer, MCAS Cherry Point Facilities Engineering Department and FRC East.

3.4.1.8 Roof and wall penetrations. All roof and wall penetrations shall be sealed using flashing (hood, drip, cap, drip edge, cant strip, etc.) and sealant to prevent entry of water and blowing rain into the building.

3.4.1.9 Conditions of areas . The subject room shall be held at a constant temperature in degrees Fahrenheit with a single point control constancy of $\pm 0.2^{\circ} C$ and 50 % $\pm 0.5\%$ RH. The contractor shall provide as an additive bid item the turn key installation cost of Johnson Controls (i.e., contact Heather Hogan @ 910-523-1286) to install the independent devices to monitor and trend the subject temperature, humidity, and vibration of scanner pad of new room.

3.4.1.10 Motors. All motors shall be premium efficiency type motors.

3.4.1.11 Condensate removal. Design cooling coil condensate removal system to empty into the existing roof drain system. Ensure all condensate is removed and properly disposed. Condensate shall not be drained on section of the existing roof. The Contractor shall install condensate piping and all piping accessories (i.e., fittings, pump, anchors, supports, etc.) so that it connects to the closest confirmed roof drain.

3.4.1.12 Castings and forgings. All castings and forging shall be free from defects such as scale and mismatching. Processes such as welding, peening, plugging, or filling with solders or pastes shall not be used on castings or forging to reclaim any defective components. Such processes may be used only for enhancing surface finish and appearance.

3.4.1.13 Welding, brazing or soldering. Welding, brazing, or soldering shall be employed only where specified in the original design. These processes shall not be employed as a repair measure for any defective part. Welding shall be accomplished by a certified welder.

3.4.1.14 Fastening devices. All screws, pins, bolts, and other fasteners shall be installed in a manner to prevent change of tightness. Fastening devices subject to removal or adjustment shall not be swaged, peened, staked, or otherwise permanently installed.

3.4.1.15 Surfaces. All surfaces shall be clear and free of sand, dirt, fins, spurs, flash, scale, flux, and other harmful or extraneous materials. All edges shall be either rounded or beveled unless sharpness is required to perform a necessary function. Except as otherwise specified herein, the condition and finish of all surfaces shall be in accordance with the manufacturer's commercial practice.

3.4.1.16 Painting. All surfaces to be painted shall be cleaned of all foreign matter. The SARS shall be painted in accordance with manufacturer's standard commercial practice. All piping, not constructed from stainless steel or copper, shall be painted with a minimum of one coat of primer and one coat of finish color.

3.4.1.17 Workmanship. Workmanship of the system and accessories shall be commensurate with the requirements specified herein and shall be of a quality prevailing among manufacturers normally producing equipment of the type specified herein.

3.4.1.18 Interchangeability. All parts shall be manufactured to definite dimensions and tolerances and standards that shall permit replacement or adjustment without modification of machine parts. Where possible, all parts shall be permanently and legibly marked with the manufacturer's original part number.

3.4.1.19 Safety. The design and operation of the SARS shall comply with OSHA 29CFR1910 sections 1910.95, 1910.169, 1910.212, 1910.219 and 1910.301 through 1910.305.

3.4.1.20 Human factors. The SARS shall comply with the human engineering requirements specified by industry standards. All operator controls and instrumentation (i.e. valves, switches, gauges, readouts, indicators etc.) shall be conveniently located for industry standards.

3.4.1.21 Electrical Labeling. Provide an identification placard for each safety switch, heater, and main disconnect with the following information: equipment name, power feed from, circuit breaker number, volt, amp, and hertz. Placard shall be black lettering on a white background and attached with rivets or screws to the center of the main disconnect and all disconnect cover.

3.4.1.22 Piping components. All piping components (i.e. valves, gauges, pipe material etc.) shall be designed, constructed, installed, and hydrostatically tested per ASME B31.9. Contractor shall properly label all pipes installed per this SOW. Per OPNAVINST 5100.23G Chapter 7 and when applicable in accordance with ASME A13.1, the Contractor shall properly label pipes with product identity.

3.4.1.23 Emergency Eyewash. The placement of the emergency eyewash station shall be in accordance with ANSI Z358.1.

3.4.1.24 Walls. All material used for interior walls shall be made of non combustible materials.

3.4.1.25 Construction Areas. The Contractor shall be responsible to cordoned off accordingly with visible caution signs all areas under construction work (i.e., includes all demolition work and remodeling work) of this SOW617WFD5775, PD617WFD5775.1, PD617WFD5775.2, PD617WFD5775.3.

3.4.2 Submittals. The Contractor shall provide project milestones using a recognized project management technique, defining all Contractor and Government responsibilities from contract award to final acceptance and training. The project management technique to be used shall be identified in the technical proposal. The milestones shall be updated every 30 days after initial submittal.

3.4.3 Documentation. The Contractor shall provide three copies of the following technical documentation:

3.4.3.1 Calibration Procedures. Calibration procedures shall be provided for all instrumentation and equipment supplied with the SARS.

3.4.3.2 Entire Parts List. A list of all parts shall be provided for all new pieces of equipment in the SARS.

3.4.3.3 Technical Manuals. Technical manuals shall be provided describing operation, maintenance, and repair of the SARS. Documentation shall include:

a. Three (3) sets of technical manuals shall be shipped with equipment. Documentation shall include at a minimum: Operations, Installation, Maintenance, Calibration, Preventive Maintenance, Lockout/Tagout Procedures, Illustrated Parts Break Down, Recommended Spare Parts List, Vendors Literature, Mechanical Design Drawings, Hydraulic/Pneumatic Schematics, and Electrical/Electronics Schematics.

3.4.3.4 Lockout/Tagout Procedures. A written procedure for locking out all energy sources shall be provided in accordance with 29CFR1910.147. Contractor shall provide a Lockout/Tagout procedure.

3.5 Build Requirements and Criteria. The HVAC system(s) and rooms shall be constructed in accordance to SOW617WFD5775 (including PD617WFD5775.1, PD617WFD5775.2, PD617WFD5775.3, PE-20555P, PE-20555M, PE-20555F drawings), and the International Code Council Codes, IBC 2003, IMC 2000, per UFC 1-200-01.

3.5.1 Installation and modifications. The Contractor shall perform the actual field installations and/or modifications, electrification, testing, construction, and balancing of the HVAC system and rooms in accordance with PD617WFD5775.1, PD617WFD5775.2, PD617WFD5775.3, PE-20555P, PE-20555M, PE-20555F and the International Code Council IBC 2003, IPC 2000 and IMC 2000 codes.

3.5.2 Damages. The Contractor shall be responsible for, and shall be required, to make good at the Contractor's own expense, all damages to any work or materials in place on the premises, or included in the contract, during execution of this SOW617WFD5775.

3.5.3 Roof Loads. The Contractor shall not transport any loads across building roofs without prior approval of a Contractor supplied rigging plan. The Contractor shall contact FRC East Project Manager for coordination with Marine Corp Air Station (MCAS) Cherry Point Engineering Office. All roofing work shall be performed by a Contractor that is approved by the existing roofing manufacturer, MCAS Cherry Point Facilities Engineering Department and FRC East.

3.5.5 Ductwork. Per requirements of PD617WFD5775.1 document shall construct, install, sealed, support, and insulate ductwork.

3.5.6.0 Clauses for NOT requiring smoke detectors and smoke/fire dampers. Due to the current single room configuration and the subject room not having any interior walls or cubicles, smoke alarms will not be required as long as the flow rate of the AHU unit is not equal to or greater than 2,000 cfm. If the flow rate of AHU unit is 2,000 cfm or greater, then smoke detectors will be required in both the supply duct and return duct.

3.5.7 Equipment and materials. Equipment and materials shall be located to avoid interference with mechanical or structural features. Raceways, junction, and outlet boxes shall not be supported from any portion of the roof deck. If any conflicts occur necessitating departures from the drawings, details and reasons of departures shall be submitted, in writing, to the FRC East Project manger and accepted before implementing any change. The Contractor shall coordinate the electrical work with HVAC and electrical drawings and provide all power related wiring even if it is not shown on the electrical drawings.

3.5.8 Electrical Power. Electrical power for the renovated area and all equipment associated with this project shall be supplied from Electrical Distribution Panel (EDP) "Q-14", (208/120 VAC, 3 Phase, 4 Wire, 60 Hz). EDP "Q-14" shall be provided and installed as indicated on PE-20555P as part of this project. Electrical power for EDP "Q-14" shall be supplied from Busway "Y". Busway "Y" is located near columns Q12 and P12 in Bldg. 137 approximately 75 feet away from the specified location of EDP "Q-14" and approximately 15 feet above the finished floor. Any questions or concerns shall be directed to the FRC East Project Manager for guidance. All work will be accordance with NFPA 70 (National Electrical Code).

(1) All conduits, junction boxes and device boxes shall be surface mounted to the finished wall. Devices shall have a minimum 20 amp rating, be commercial grade or better and white in color, unless otherwise specified. All devices shall have the appropriate size and type raised metal covers.

(2) Liquid tight flexible metal conduit (LFMC) shall be used in place of rigid conduit for all connections to reciprocating equipment including motors. Provide appropriate conduit and cable management accessories for installation, which shall allow a neat and orderly installation and provide proper conduit and cable support. No electrical equipment, conduits, wiring or any other associated material shall be re-used without prior approval. All wiring shall be installed in electrical metallic tubing (EMT), rigid (galvanized) metal conduit (RMC), flexible metal conduit (FMC), or liquid tight flexible metal conduit (LFMC). No metal clad cable (MCC) shall be installed in the FRC East.

(3) Conduit systems shall be installed as indicated. Conduit sizes shall be based on the use stranded copper conductors, with THHN/THWN insulation except where otherwise indicated, solid and/or aluminum conductors shall not be permitted in FRC East. Minimum size of raceways shall be ¾ inch, unless specified otherwise. Electrical metallic tubing may be installed only within buildings. Rigid metal conduit shall be installed in concrete, grout, wet and damp locations. Only UL listed connectors shall be used to connect conduits, boxes, and conduit bodies. EMT or FMC will not be installed in damp or wet locations. Aluminum conduit shall be used only when specified. Rigid (galvanized) metal or stainless steel sleeves when conduits penetrate and/or pass through any types of floors or walls. All penetrations shall be properly sealed and fire-stopped.

(4) Conduits and raceways crossing structural expansion joints shall be provided with suitable expansion fittings or other suitable means to compensate for the building expansion and contraction and to provide continuity of grounding. Bushings shall be installed on the ends of all conduits and shall be of the insulating type where required by NFPA 70. Fittings for all electrical conduits shall be manufactured of steel not cast. EMT shall require steel compression fittings. RMC shall require steel threaded fittings. FMC and LFMC shall require their appropriate steel fittings. Exposed raceways shall be installed parallel or perpendicular to walls, structural members, or intersections of vertical planes and ceilings. Raceways under raised floors and above accessible ceilings shall be considered as exposed installations. Changes in direction of runs shall be made with symmetrical bends or conduit bodies. Field-made bends and offsets shall be made with an approved electrical conduit hand bender or conduit-bending machine. Crushed or deformed raceways shall not be installed. Raceways in damp and wet locations shall be avoided where possible.

3.5.9 System Shutdowns. The contractor shall request in writing, at least one week in advance, of the need to have the Government shutdown and/or drain existing equipment associated with any system to be modified. The FRC East Project Manager and the contractor shall mutually agree upon shutdown dates and times. If a system change requires a change to a fire protection system, then the contractor shall request in writing, at least two week in advance, of the need to have the Government shutdown and/or drain an existing fire protection system to allow the contractor to perform the required system modifications. The contractor's request should include a specific day for the system to be shutdown and how long the shutdown will last. The contractor shall coordinate these shutdowns with the FRC East Project Manager. The contractor shall at no time shutdown or drain any fire protection sprinkler systems without notifying the FRC East Project Manager. The Government will shutdown and/or drain any fire protection sprinkler systems required by this SOW. The contractor shall follow the standard practice of Lockout/Tagout procedures as identified in Title 29CFR1910.147, The Control of Hazardous Energy (lockout/tagout) and Title 29CFR1910.332, Electrical-Safety-Related work practices as prescribed by OPNAVINST 5100.23G, Chap 24.

3.5.10 Burning Permits. Any contractor that will be burning/welding/soldering will be required to obtain a permit from the Cherry Point Fire Department. The contractor will need to provide the person's name who will be performing the work, company name and have a contact number for the contractor performing the work. This shall be coordinated through the FRC East Project Manager.

3.5.11 Construction Site Cleanliness. Work related to this project might be capable of generating hazardous wastes. Before beginning construction, the contractor shall contact the FRC East Project Manager, on how to properly dispose of all hazardous and non-hazardous wastes. It is the contractors responsibility to control all dust generated from the demolition work. The contractor shall keep the installation/modification work sites clean of trash and debris. At a minimum, daily work site cleaning shall be required. The FRC East Project Manager will inspect the work area around each system at its discretion. Any cleaning or trash problems not corrected by the contractor in a timely manner will result in payment being withheld until the problem is corrected. If equipment or equipment components are going to be removed and disposed of, then it shall be decontaminated prior to disposal at Building 4466. Contractor shall contact Gary Crossley (464-9297) 24 hours prior to delivery by the Contractor. Contractor shall ensure that any waste generated is appropriately identified and disposed of in accordance with any and all applicable local, state, and federal regulations. For specifics or assistance please contact Andrew Krelie (252-464-7491) or Gary Crossley (252-464-9297).

3.6 Requirements for removal and installation of SARS equipment.

3.6.1 Work Site. The Contractor shall cleanup the area around the working area at the end of each workday to ensure safe access to and egress from all specific work areas.

3.6.2 Storage space. The Government will not be held responsible for the Contractor's possessions.

3.6.3 Utilities. . The Contractor is responsible for all connections from the supply locations to the SARS equipment. The Government will provide the following utilities within 200 feet:

- a) Electrical Power: 208/230 VAC, 60 Hz, 3 ph, 4 wire with grounding conductor
- b) Electrical Power: 120 VAC, 60 Hz, single phase with grounding conductor

3.6.4 Installation. The SARS installation shall start on a date mutually agreed to by the Government and the Contractor. Installation shall begin within seven (7) calendar days after equipment delivery. The Contractor shall furnish all required materials and labor to assemble and install all equipment furnished under this specification, shall connect the equipment to the required utility sources, and place the equipment in proper operation.

3.6.4.1 Installation Coordination: All installation work shall be coordinated through the procuring contracting FRC East project manager. The Contractor shall provide notice to the FRC East Project manager and the Industrial Planning Division of desired installation start date not later than 30 days prior to that date. Actual start date shall be coordinated with the FRC East project manager.

3.6.5 Contractor responsibilities. The Contractor shall be responsible for unloading, receiving, storing, handling, uncrating, inspecting, checking, cleaning, assembly, rigging, and installing equipment in its proper location complete with accessories, in satisfactory operational condition. All unloading, handling, and moving shall be performed to preclude damage to materials, equipment, and building facilities.

3.6.6 Precautions. The Contractor shall not drag equipment without the benefit of metal skid plates or wooden skids and shall not drag, skid, or slide any equipment on finished floor. In areas with finished floors, equipment shall be moved by means of load spreading rollers, dollies, or shall be trucked clear of the floor.

3.6.7 Equipment Removal. Existing equipment containing a plant account tag that is demolished per this design(s) shall be removed by the contractor at the contractors' expense. The plant accounted equipment shall be removed and transported by the contractor to the depot's used oil berm/shelter or the stripping hanger for decontamination and disposal. The contractor shall notify the Hazardous Waste work leader at Phone number 252-464-7439, 72 hours prior to delivering any piece of equipment. After decontamination, the Government shall dispose of decontaminated equipment. The Contractor shall comply with all Federal, State, local environmental regulations when disposing of all items.

3.6.8 Plant Accounting. The contractor shall remove equipment plant account tags and give tags to the FRC East Project Manager for plant accounting purposes. The plant account tag is typically a silver metal tag, approximately 3/4 inch x 2 inches. The tag is marked "US Navy Property" and has an eleven-digit number located beneath a bar code. The contractor shall provide equipment data (Manufacturer Name, Model Number, Serial Number, etc.) for all new equipment installed per this Design/Build Project. The contractor shall complete form 13700/202 (Plant Equipment Checklist) for each new piece of equipment and send the completed forms to the FRC East Project Manager for plant accounting purposes.

3.7 Training. The contractor shall furnish the services of an instructor who shall instruct designated personnel in adjustment, operation, maintenance, and calibration of all equipment purchased by this SOW617WFD5775, including pertinent safety requirements. Instructors shall be familiar with the operation and maintenance of the equipment and shall be experienced in operation and maintenance training. Training shall be conducted at the FRC East during normal work hours of 7:00 a.m. to 3:30 p.m., and shall commence the next full calendar week following the acceptance of the system. All materials, manuals, tapes, data, etc. shall be contractor furnished and shall become the property of the FRC East at the end of the training period. Training shall be for a period of at least one four-hour period per group. The contractor shall set up a time, with the FRC East Project Manager, for training that will best fit with all personnel to be trained. Training requirements shall be for a maximum of the following numbers and groups.

- Two engineering personnel (One Mechanical Engineer, One Electrical Engineer)
- Seven maintenance personnel (Two Electronic Controls, One Electrician and Three HVAC Service Technicians, One mechanic)

Training shall include actual hands-on instruction with the equipment.

3.7.1.1 Mechanical maintenance. Mechanical / HVAC maintenance training shall include as a minimum:

- a. Review all SARS mechanical schematics and drawings.
- b. Component location and function of all SARS equipment.
- c. Troubleshooting procedures and techniques of all SARS equipment.
- d. Repair procedures of all SARS equipment.
- e. Adjustments, calibration, setups (when, how, where) of all SARS equipment.
- f. Preventative maintenance procedures of all SARS equipment.
- g. Thoroughly familiarize (i.e., hands on training) all personnel with programming system.
- h. Thoroughly familiarize (i.e., hands on training) all personnel with operating and calibrating system.
- i. Thoroughly familiarize (i.e., hands on training) all personnel with maintaining and troubleshooting the system.
- j. Review the formalized procedure for Lockout/Tagout procedure stated in section 3.4.3.4.

3.7.1.2 Electrical maintenance. Electrical and electronic maintenance training shall include as a minimum:

- a. Review electrical and electronic wiring schematics and drawings for all SARS equipment.
- b. Troubleshooting procedures and techniques for all SARS equipment.
- c. Electrical and electronic equipment servicing for all SARS equipment.
- d. Procedures for adjustments (i.e. locating equipment, adjustments to be made, equipment required to make adjustments) for all SARS equipment.

- e. Adjustments, calibration, setups (when, how, where) of all SARS equipment.
- f. Preventative maintenance procedures of all SARS equipment.
- g. Thoroughly familiarize (i.e., hands on training) all personnel with programming system.
- h. Thoroughly familiarize (i.e., hands on training) all personnel with operating and calibrating the system.
- i. Thoroughly familiarize (i.e., hands on training) all personnel with maintaining and troubleshooting the system.
- j. Review the formalized procedure for Lockout/Tagout procedure stated in section 3.4.3.4.

3.8 Precedence. In the event of conflict between the performance and physical requirements specified herein, performance requirements shall take precedence over physical requirements. If conflicting information exists, the Contractor shall notify the Government of each instance of conflict.

3.9 Deviations. In no event shall any understanding or agreement between the contractor and any Government employee other than the Contracting Officer on any modification, change order, letter, or verbal direction to the contractor be effective or binding upon the Government. All such actions must be formalized by a proper contractual document executed by an appointed Contracting Officer. The contractor is hereby put on notice that in the event a Government employee other than the Contracting Officer directs a change in the work to be performed, it is the contractor's responsibility to make inquiry of the Contracting Officer before making the deviation. Payments will not be made without being authorized by an appointed Contracting Officer with the legal authority to bind the Government.

3.10 Tools. The contractor shall supply all tools and equipment to provide services required in this SOW. The contractor shall NOT, at anytime, borrow or use any FRC East tools or equipment. This includes forklifts, ladders, man lifts, motorized lifts, and electric carts.

4.0 Acceptance Testing and Inspection.

4.1 General Test and Inspection Criteria. The contractor shall provide, at a minimum, a two-week notice for inspection and acceptance testing. All testing shall be performed in the presence of the FRC East Project Manager for each system installed or modified by this statement of work (i.e., SOW617WFD5775) to ensure compliance with all applicable codes. All sprinkler system modifications and installation work accomplished by this statement of work (i.e., SOW617WFD5775) shall be inspected, system test witnessed, and the final installation accepted by the Fire Inspector. All punch list items shall be resolved within two weeks of final inspection. Three copies of the equipment manuals shall be provided three weeks before a scheduled final inspection of the installation, modification, and construction.

4.2 Methods for Testing.

4.2.1 Overview of Required Testing. The following acceptance testing procedures will be reviewed by the Government before work accomplished under this SOW is considered complete.

- a. Visual Inspection conducted by the government.
- b. Performance test authored by the contractor, agreed upon by the Government, conducted by the contractor and witnessed by the Government.
- c. Final test conducted by the contractor and witnessed by the Government.

4.2.2 Visual Inspection. A visual inspection shall be made to ensure all work is to code, in a professional manner and in accordance with FRC East drawings PE-20555F, PE-20555M and PE-20555P and the submitted contractor Professional Engineer drawings. In addition, the controls graphics and graphics interface shall be visually inspected for operation and integration. Safety concerns will also be looked for to ensure there are no trip or other hazards identified.

4.2.3 Electrical Follow-Up and Verification. Upon completion of acceptance checks, settings, and tests, the Contractor shall show by demonstration in service that circuits and devices are in good operating condition and properly performing the intended function. Circuit breakers shall be tripped by operation of each protective device. Test shall require each item to perform its function not less than three times. As an exception to requirements stated elsewhere in the contract, the FRC EAST project manager shall be given 5 working days advance written notice of the dates and times for checks, settings, and tests.

4.2.4 Performance Test. The Contractor shall submit a detailed performance test procedure within 30 days after contract award. The Government will then review and comment back to the Contractor. When a consensus, by the Contractor and the Government, has been achieved the Contractor's proposed testing shall demonstrate the equipment and systems shall meet and fulfill all contract requirements. Within five days after the above consensus, the Contractor shall provide three copies of the proposed performance test plan to the Government. At the completion of the installation, the Contractor shall notify the Government that they are ready for Government inspection. The inspection will occur Monday – Friday, 7:00 am – 3:00 pm. The inspections and tests shall be conducted by the Contractor with FRC East's Mechanical Engineer (Code 6.3.1) and other FRC East contract specialist in attendance. All punch list items shall be resolved within 2 weeks of final performance test. Thirty days after Contract award, the Contractor shall provide and submit to the Government, for review, the following:

a.) The Contractor shall author and submit a series of detailed Performance Test on all Contractor installed components and systems. Each Contractor submitted performance test shall clearly outline and define the following:

(1) Each performance test identified, the Contractor shall provide a written step by step of each procedure of all test. Each test procedure shall identify all items to be tested, the test equipment, support required, test conditions to be imposed, the parameters to be measured, and pass/fail criteria against which the test results will be measured. All equipment used to verify and measure performance of equipment / component shall be provided and calibrated by the Contractor.

b.) As part of each Contractor written performance test, a performance test log sheet shall be created and submitted by the Contractor as part of the proposed performance test. Each log sheet shall state with the recording parameter the allowable high value, allowable low value and the typical expected value. All log sheets created shall be utilized by the Contractor for data entry during actual performance testing.

As a minimum, the performance test shall demonstrate that each piece of equipment procured (EP) in this project meets or exceeds original equipment manufactures (O.E.M) performance specifications and contract requirements (i.e., PD617WFD5775.1, PD617WFD5775.2, PD617WFD5775.3, SOW617WFD5775, PE-20555F, PE-20555M, PE-20555P) requirement for flow, temperature, specific control abilities, and other performance requirements specified by the herein.

The Contractor shall provide all typical performance data (i.e., fan curve, etc.) for each piece of equipment at least 14 days after equipment selection. The performance test shall take place on two consecutive days for a period of 8 consecutive hours each day. Performance testing shall take place on a date mutually agreed upon by the Contractor and the COR. During the two eight hour test beginning at 60 minutes after the commencement of the test and each 60 minutes thereafter, the Contractor shall record the actual performance values per O.E.M stated performance data and contract requirements (i.e., SOW617WFD5775). The Contractor is responsible for providing all testing equipment and all additional resources (i.e., equipment and labor) to provide and record accurate testing results. Additionally, failure of EP to remain within specified limits of performance data constitute failure of the performance test. Consideration will be given to accepting the EP notwithstanding a reading or readings outside the limits specified in the manufacturer's commercial manual provided the manufacturer furnishes certification that the "out of limit" reading(s) will not degrade or jeopardize unit performance or service life expectancy. If the EP fails to meet the requirements stated herein, the Contractor will be given 5 days to correct the problem and a second performance acceptance test will be held. If after the second performance acceptance test the EP fails to meet the requirements specified in the original equipment manufactures (O.E.M) performance data and contract requirements (i.e., SOW617WFD5775, PE-20555F, PE-20555M, PE-20555P), the Government will have the right to terminate the contract and request the removal of the EP. After successful completion of the performance test, the Contractor shall provide three copies of a summary report (i.e., data, written narrative on the test and overall performance of each piece of equipment, type and accuracy of testing equipment) of the performance test to the Government. The Contractor shall submit the summary within 5 days after the performance test.

4.2.5 Functional Test. A balance report shall be performed and presented, to the Government, at the end of the project per AABC or NEBB format. The room and HVAC system(s) shall be monitored for 48-hours to insure proper operation and function. Documentation shall be provided showing that monitoring has been performed.

4.2.6 Final Test. A trend history shall be performed over the course of 48-hours to insure that readings are being collected by the FRC East operator workstations and that the equipment is functioning as designed, for status points listed in the as-built points list. If the system as an error in reading the status during the course of the 48-hour test period the item shall be corrected and an additional 24-hour test shall begin.

4.3 Additional Test and Inspection Criteria. The contractor shall notify the FRC East Project Manager for inspection. All corrective action for items found at or before final inspection shall be resolved within 2 weeks or less after each inspection.

4.4 Warranty. A minimum of one year warranty shall be provided by the Contractor on parts and labor provided by this specification. The warranty shall start after satisfactory completion of the Final Acceptance Test. The warranty shall cover all costs (i.e., labor, travel, meals, hotel, parts, freight, materials, equipment, supervision, and transportation expenses). Upon notification of a discrepancy covered by the warranty, the Contractor shall arrive at the FRC East within 48 hours to initiate repairs.

5.0 WORK SCHEDULE. All installation work associated with this contract shall be accomplished at the FRC East. Normal daily work hours shall be between 7:00 a.m. and 3:30 p.m. Monday through Friday, except Federal Holidays. The FRC East Project Manager must accept any deviation from normal hours. The Contractor shall notify the Government (COR) at least fourteen (14) days prior to any work scheduled for weekends. No removal, installation, construction work of this SOW617WFD5775 shall cause or require shut down of FRC EAST during any work week and or day (Monday through Saturday), that is the Contractor shall not cause any interruptions in any FRC EAST work production schedule. All work that requires down time of system shall be planned and coordinated to be installed on FRC EAST property during FRC EAST approved 2 consecutive days or approved (i.e., approved by the COR and Contracting Officer) working days. The contractor shall schedule and coordinate his construction with the FRC East Project Manager to minimize impact on FRC East production operations. This may require 2nd shift, 3rd shift, and/or weekend construction in some locations.

5.1 DELIVERY FOR DESIGN AND CONSTRUCTION. **The systems shall be installed and completed within 105 calendar days or less after award.**

6.0 NOTES.

6.1 Bid Instructions. The contractor's bid shall include:

- a. A copy of the contractor's Contracting license(s) will be required.
- b. A response to each paragraph and subparagraph in this statement of work with one of the following terms, "comply" or "exception".
 - (1) Comply shall be used when quoting exactly what is specified.
 - (2) Exception shall be used when the contractors quoted work differs from a specific paragraph or subparagraph. The contractor shall provide a written detail of all exceptions.
- e. The bid package shall provide an itemized breakdown of total price.

6.2 Pre-Bid On-Site Meeting. The contractor shall attend a pre-bid on-site meeting with other potential bidders to review the SOW617WFD5775 in the field before submitting a bid. The contractor shall attend an on-site pre-bid walk around meeting to review the construction work to be accomplished. The time and date for the meeting will be

set by the contracting officer and the FRC East Project Manager. The FRC East Project Manager will provide a site drawing to the contractor(s) at this meeting. Lack of knowledge of existing conditions will not be considered a basis for contractor change orders. Before ordering equipment, verify that equipment to be provided under this contract is acceptable, and can fit into the building and the installation site. Expense incurred by the contractor, which in the FRC East Project Managers opinion could have been avoided by a pre-bid site visit, shall not be a basis for change orders. Field verify all dimensions and site conditions prior to procuring materials or commencing work.

POSSIBLE SUPPLIERS:

PURCHASE DESCRIPTION – PD617WFD5775 (PD617WFD5775.1, PD617WFD5775.2, PD617WFD5775.3)

Parameter Generation & Control, Inc.
Attention: Clay Hile (828) 669 – 8717 ext. 312
PO Box 129
1054 Old US 70 West
Black Mountain, NC 28711

STATEMENT OF WORK – SOW617WFD5775 (PE-20555F, PE-20555M, PE-20555P)

Owens Construction Inc.
Attention: Tom Owens (252) 725-2417
109 Sherwood Blvd.
Beaufort, NC 28516

PURCHASE DESCRIPTION

1. **NOMENCLATURE**: 800-1200 CFM Precision Humidity and Temperature Conditioner (enclosed for roof mount)
2. **BRAND NAME DESIGNATION**: PGC 800-1200 CFM Cascade System
3. **MODEL IDENTITY**: PGC, Inc, Model 9381-4110 Horizontal Conditioner, 230 V, 3 phase (with roof mount enclosure)
4. **DESCRIPTION/ESSENTIAL CHARACTERISTICS**:

- a. **General**: The unit (i.e., Model 9381-4110 Horizontal Conditioner or equivalent) shall be a packaged temperature and humidity air handling unit with electric heat, digital HygoClip (reference PD617WFD5775-2) temperature and humidity sensor, and PGC SmartPad controller package (reference PD617WFD5775-3). The unit shall be factory assembled and tested at the specified temperature requirement tolerance of $\pm 0.2^{\circ}\text{C}$ and humidity requirement tolerance of $\pm 0.5\%$ Relative Humidity.

The original equipment manufacturer shall provide a complete system that shall consist of one unit and all accessories. The unit (i.e., Model 9381-4110 Horizontal Conditioner or equivalent) shall consist of an air handler, enclosure ventilation, and a remote mount controller. The remote mount controller shall be mounted inside the conditioned room by the original equipment manufacturer. The unit accessories shall consist of correctly selecting, purchasing, installing, and testing all ducts, supply registers, and return registers shall meet performance requirements and installation requirements stated in SOW617WFD5775 and PE-20555M. The original equipment manufacturer shall purchase, construct, insulate (as required), and install all ducts (i.e., flex duct from the conditioner to room and rigid ducting within room). The original equipment manufacturer, shall make all final control connections to the unit, and perform start-up on the unit once the contract's prime contractor (per SOW617WFD5775) has correctly connected all utilities (power, process water, and drain) to the subject unit (i.e., Model 9381-4110 Horizontal Conditioner or equivalent).

The unit shall be modified by the original equipment manufacturer to include all roof mounted enclosure components. These enclosure components shall include an air cooled condenser and required tie downs. The subject mounting requirements for the unit (i.e., unit includes the enclosure provided for the unit) shall include all engineering supervision, labor required to lift, locate and properly tie unit down (i.e., connect to roof curbing). The Contract's prime contractor shall mount and secure the subject unit to the roof curbing per SOW617WFD5775 and PE-20555M. In addition, all roof curbing shall be installed by the contract's prime contractor per SOW617WFD5775 and PE-20555M. Total weight is 3500-4000 lbs, including enclosure, if total weight exceeds the 4000 lbs the prime contractor shall notify the Government immediately, in writing and wait for response by the Government before proceeding.

In summary, the Contract's prime contractor per SOW617WFD5775 shall install roof curbing, provide placement and mounting of conditioner, provide all roof penetrations for ducting, and run low voltage control wiring between conditioner and controller. The original equipment manufacturer PGC or equivalent shall supply the wire and make the final connections.

- b. Major Components: The system shall be a completely self contain unit with temperature and RH conditioner including all motors (refrigeration, blower, saturator pump, control actuators), air reheat package, and dew point saturator. The unit shall be completely factory wired with necessary controls and electrical components. Control wiring shall be low voltage from the 230V source. All exterior panels shall be fabricated of stainless steel or a suitable weather resistant material. Weather tight gasket doors or equivalent shall be provided for access to all maintenance required areas (i.e., saturator chamber).
- c. Capacity: The system shall have very precise control (single point control constancy of $\pm 0.2^{\circ}\text{C}$ and $\pm 0.5\%$ RH), and in order to maintain proper uniformity across the conditioner area, total heat load is limited to 4500 btu/hour.
- d. Filter: The air handling unit shall be provided with UL listed 2 inch thick throwaway 30% pleated filters.
- e. Safety Controls: The air handling unit shall be provided with a thermal overload protection device. Refrigeration will have high and low pressure safety devices. Low saturator cut off float switch.
- f. Fans: Fan motor shall be provided with built-in current and thermal overload protection device.
- g. Refrigerant: The unit shall be fully charged with R-404 refrigerant.
- h. Process water: Unit supplied with RO (reverse osmosis) filter and 20 gallon reserve tank.

5. EQUIPMENT MANUALS: Three (3) sets of equipment manuals shall be provided. These manuals shall contain all required technical data including operating instructions, parts lists, wiring diagrams, mechanical diagrams, and maintenance instructions.

POSSIBLE SUPPLIERS:

Parameter Generation & Control, Inc.
Attention: Clay Hile (828) 669 – 8717 ext. 312
PO Box 129
1054 Old US 70 West
Black Mountain, NC 28711

PURCHASE DESCRIPTION

1. NOMENCLATURE: HygroClip
2. BRAND NAME DESIGNATION: Rotronic HygroClip™ T/Rh transmitter
3. MODEL IDENTITY: HygroClip
4. DESCRIPTION/ESSENTIAL CHARACTERISTICS:

a. General: Rotronic HygroClip™ T/Rh transmitter is digital temperature and relative humidity (RH) sensor. This probe is accurate to $\pm 1.0\%$ RH and $\pm 0.1^\circ\text{C}$.

The PGC SmartPad (reference in PD617WFD5775.3) controller takes the direct digital signal from the HygroClip.

5. EQUIPMENT MANUAL: Three (3) sets of equipment manuals shall be provided. These manuals shall contain all required technical data including operating instructions, parts lists, wiring diagrams, mechanical diagrams, maintenance instructions, and calibration instructions.

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PURCHASE DESCRIPTION

1. NOMENCLATURE: SmartPad Controller
2. BRAND NAME DESIGNATION: SmartPad Controller
3. MODEL IDENTITY: Steady State and Programmable Controller
4. DESCRIPTION/ESSENTIAL CHARACTERISTICS:

- a. General: PGC SmartPad controller package is designed to control PGC air handlers and chambers (i.e., PD617WFD5775.1). This controller includes steady-state or 40 segment programmable capability, nonvolatile program, set point and PID storage, RS-232 serial interface, air and relative humidity alarms (hi/low or deviation) and communicates with SmartLog, windows based software package for remote user interface.

The SmartPad software is capable of operating in several control modes; two temperature, cascade, dryer and slow damper mode. This software will also behave differently based on the temperature range (low temperature range). Some modes are not applicable for every system.

In the cascade and slow damper modes the user enters the air temperature and relative humidity set points. The water set point is automatically determined by the control unit module. Slow damper mode is similar to cascade mode except that it will provide slow damper outputs for the air control loop.

The two-temperature mode, the air and water set points are entered directly by the user. The desired relative humidity must be determined by measuring the conditions in the chamber and or using a standard air/relative humidity/water spray graph.

Dryer mode is applicable only for units equipped with a desiccant dryer that need dew points below freezing. In this mode, the air temperature and relative humidity are entered by the user. The relative humidity is controlled using a desiccant dryer.

SmartPad software is capable of operating with both analog and digital temperature and relative humidity sensors. Certain features will be disabled or enabled depending on which type of sensor is applied. For example, if digital sensors are applied, the water RTD calibration is accessible from the SmartPad. With analog sensors, this feature is disabled.

5. EQUIPMENT MANUAL: Three (3) sets of equipment manuals shall be provided. These manuals shall contain all required technical data including operating instructions, parts lists, wiring diagrams, mechanical diagrams, maintenance instructions, and calibration instructions.

POSSIBLE SUPPLIERS:

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