

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING AND EXPEDITIONARY WARFARE CENTER
1000 23RD AVENUE
PORT HUENEME CA 93043-4301

IN REPLY REFER TO:

4200/ACQ71
29 Feb 2016

Subject: REQUEST FOR TASK ORDER PROPOSAL N39430-16-D-1810; PLANNING TASK ORDER X001; HYPERBARIC SYSTEMS AT SEAL DELIVERY VEHICLE TEAM ONE (SDVT1), BUILDING 995, PEARL CITY, HI

General Information:

1. Planning Task Order (PTO) Number: X001
2. Issuing Office: NAVFAC EXWC
1100 23rd Ave., Bldg 1100
Port Hueneme, CA 93043-4301
3. Contract Specialist: Keith Garascia, (805) 982-2373, keith.garascia@navy.mil
4. Award Date: Offeror's should utilize 1 Jun 2016 as the planned award date.
5. Location: Pearl City, HI.
6. Site Visit: No site visit is currently planned.
7. Proposal Due Date: Proposals for this PTO are due at the closing date established for the overall solicitation.
8. Contract Type: Firm Fixed Price

Attachments:

1. Performance Work Statement - 36 Pages
2. Davis-Bacon Wage Determination: HI160001, modification 4, dated 26Feb 2016 – 18 Pages
3. Quality Assurance Surveillance Plan – 8 Pages

Contract Clauses

In addition to the clauses included in the basic contract, the following clauses are tailored for this PTO and will appear in the awarded task order:

52.211-10 COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK (APR 1984)

The Contractor shall be required to (a) commence work under this contract within 15 calendar days after the date the Contractor receives the notice to proceed, (b) prosecute the work diligently, and (c) complete the entire work ready for use not later than 365 days after award. The time stated for completion shall include final cleanup of the premises.

(End of clause)

252.232-7006 WIDE AREA WORKFLOW PAYMENT INSTRUCTIONS (MAY 2013)

(a) Definitions. As used in this clause--

Department of Defense Activity Address Code (DoDAAC) is a six position code that uniquely identifies a unit, activity, or organization.

Document type means the type of payment request or receiving report available for creation in Wide Area WorkFlow (WAWF).

Local processing office (LPO) is the office responsible for payment certification when payment certification is done external to the entitlement system.

(b) Electronic invoicing. The WAWF system is the method to electronically process vendor payment requests and receiving reports, as authorized by DFARS 252.232-7003, Electronic Submission of Payment Requests and Receiving Reports.

(c) WAWF access. To access WAWF, the Contractor shall--

(1) Have a designated electronic business point of contact in the System for Award Management at <https://www.acquisition.gov>; and

(2) Be registered to use WAWF at <https://wawf.eb.mil/> following the step-by-step procedures for self-registration available at this Web site.

(d) WAWF training. The Contractor should follow the training instructions of the WAWF Web-Based Training Course and use the Practice Training Site before submitting payment requests through WAWF. Both can be accessed by selecting the "Web Based Training" link on the WAWF home page at <https://wawf.eb.mil/>.

(e) WAWF methods of document submission. Document submissions may be via Web entry, Electronic Data Interchange, or File Transfer Protocol.

(f) WAWF payment instructions. The Contractor must use the following information when submitting payment requests and receiving reports in WAWF for this contract/order:

(1) Document type. The Contractor shall use the following document type(s).

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(2) Inspection/acceptance location. The Contractor shall select the following inspection/acceptance location(s) in WAWF, as specified by the contracting officer.

Destination

(3) Document routing. The Contractor shall use the information in the Routing Data Table below only to fill in applicable fields in WAWF when creating payment requests and receiving reports in the system.

Routing Data Table*

Field Name in WAWF

Data to be entered in WAWF

Pay Official DoDAAC	N68732
Issue By DoDAAC	N39430
Admin DoDAAC	N39430
Inspect By DoDAAC	N39430
Ship To Code	N/A
Ship From Code	N/A
Mark For Code	N/A
Service Approver (DoDAAC)	N/A
Service Acceptor (DoDAAC)	N39430
Accept at Other DoDAAC	N/A
LPO DoDAAC	N39430
DCAA Auditor DoDAAC	N/A
Other DoDAAC(s)	N/A

(4) Payment request and supporting documentation. The Contractor shall ensure a payment request includes appropriate contract line item and subline item descriptions of the work performed or supplies delivered, unit price/cost per unit, fee (if applicable), and all relevant back-up documentation, as defined in DFARS Appendix F, (e.g. timesheets) in support of each payment request.

(5) WAWF email notifications. The Contractor shall enter the email address identified below in the “Send Additional Email Notifications” field of WAWF once a document is submitted in the system. To be specified on each task order.

alin.schmutz@navy.mil

(g) WAWF point of contact. (1) The Contractor may obtain clarification regarding invoicing in WAWF from the following contracting activity's WAWF point of contact.

jill.haralson@navy.mil

(2) For technical WAWF help, contact the WAWF helpdesk at 866-618-5988.

(End of clause)

CONTRACT SPECIFICATION

HYPERBARIC SYSTEMS AT

BUILDING 995

SEAL DELIVERY VEHICLE TEAM 1

PEARL CITY, HI

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THAT NO SPECIFICATION IS INTENDED IN THAT PARAGRAPH.

1. GENERAL PARAGRAPHS

1.1 GENERAL:

1.1.1 INTENTION: It is the declared and acknowledged intention and meaning to procure hyperbaric facilities, as described herein, to include design, fabrication, outfitting and testing of Hyperbaric Systems to be installed in Building 995 at Seal Delivery Vehicle Team 1 (SDVT1) in Pearl City, Hawaii. The contractor shall be responsible for all work specified herein. The hyperbaric systems shall be complete and useable upon conclusion of the work.

1.1.2 DESCRIPTION OF WORK: The contractor shall provide all labor and materials for the design, procurement, fabrication, assembly, shop testing and shipping of the described Vehicle, MK25/MK16 and SCUBA charging stations and all associated piping, compressors and air & oxygen storage. Further, the contractor shall prepare and submit all documents, records and manuals specified herein.

- a. Provision of the compressors and air flask storage as described herein.
- b. Provision of the Oxygen Storage as described herein.
- c. Provision of the Vehicle Charging Stations as described herein.
- d. Provision of the SCUBA Charging Station as described herein.
- e. Provision of the MK25/MK16 charging station as described herein.
- f. Provision of systems manuals.
- g. Submission of the design, fabrication & test documents.

1.1.3 DESCRIPTION OF FACILITIES: The hyperbaric contractor shall provide the following work. Parts C3.2 and C6 contain drawings and schematics of the facility:

- a. Vehicle Charging Stations:** The vehicle charging stations shall be located in the High Bay.
- b. MK25/MK16 Charging Station:** The MK25/MK16 Charging System shall be located in the Dive Locker and High Bay. The charging station shall also include a charging wet sink.
- c. SCUBA Charging Station:** The SCUBA Charging Station shall be located in the High Bay.
- d. Maintenance Panel:** The Dive Locker shall house the Maintenance Panel and its three connections.
- e. Gas Farm:** The Gas Farm will contain the Oxygen Supply Panel and the Air Flask Banks.
- f. Compressor Room:** The Compressor Room shall house the two (2) compressors and the Gas Distribution Panel.
- g. Clean Room Nitrogen Supply Piping:** The High Bay shall house the extension of the supply piping for nitrogen for the Clean Room.

1.1.4 GOVERNMENT FURNISHED EQUIPMENT (GFE): Three (3) umbilicals for use in the facility's pool. The contractor shall coordinate to

ensure the Surface Supply Diving System works with the GFE umbilicals.

- 1.1.5 EXISTING CONDITIONS:** The existing piping systems are installed in Building 995. They are to be demolished by the contractor in their entirety. Copies of the schematics of the existing systems shall be turned over to the contractor upon request. Work on the existing facilities shall be conducted with care not to damage facilities. All existing facilities damaged by such work shall be rectified promptly without additional cost to the Government. Where existing facilities must be changed, or where new facilities adjoin, connect to, or abut existing facilities, the existing facilities shall be altered only as necessary and approved, in a substantial, neat and workmanlike manner.
- 1.1.6 LOCATION:** Building 995, SDVT1, Pearl City, Hawaii
- 1.1.7 TIME OF DELIVERY:** The work shall begin (on the "Start Work date") 15 consecutive calendar days after the "Award Date". The planned contract completion date is 365 consecutive calendar days after the "Award Date". The completion date will be determined by the contractor's proposal. The contractor shall make no component nor material procurement until after the Preliminary Design has been submitted, unless approval is received from the Contracting Officers Representative (COR).
- 1.1.8 N/A**
- 1.1.9 "IN KIND" REPLACEMENT DEFINITION:** The in kind replacement of a component is defined as the identical component if the identical component is still in manufacture. In the event the identical component is no longer in manufacture, the replacement component must meet all of the requirements of the original component. The requirements of the original components can usually be obtained from the original supplier/manufacturer. If "in kind" components are not available, then replacement components shall be provided upon review by the COR to the contractor.
- 1.1.10 "HYPERBARIC" TERM:** Anywhere in this specification where the term "Hyperbaric" is used, it shall be assumed (where applicable) to mean "Hyperbaric Systems".

1.2 ADDITIONAL PARAGRAPHS:

- 1.2.1 SPECIAL PERFORMANCE REQUIREMENTS DUE TO HAZARDS TO PERSONNEL:** Attention of prospective offerors is called to the fact that this contract calls for the fabrication of life sensitive support systems. Failure to adhere to the highest standards of metallurgy, welding, oxygen cleanliness and workmanship will create severe hazards to persons working on or near these systems when they are pressurized. Failure to meet these requirements may be cause for termination for default, and in any event will be cause for Government rejection of components.

- 1.2.2 CONTRACTORS TECHNICAL RESPONSIBILITY:** This specification contains technical requirements to which the contractor must adhere; however, it is the contractor's responsibility to confirm by engineering analysis that component sizes cited herein are adequate to perform the "Operational/ Performance Requirements" cited in Part C2. Typical of such items are pipe sizes, number of high pressure media storage flasks, etc. Data has been provided herein to demonstrate the conceptual feasibility of such a facility. Other technical issues that are not specified herein are at the discretion of the contractor. The contractor shall cite his intentions in these areas in the preliminary design.
- 1.2.3 CONFORMANCE REQUIREMENTS:** Omissions from the drawings or specifications or the misdescription of details of work which are manifestly necessary to carry out the intent of the drawings and specifications, or which are customarily performed, shall not relieve the contractor from performing such omitted or misdescribed details of the work but they shall be performed as if fully and correctly set forth and described in the drawings and specifications.
- 1.2.4 CONTRACTOR'S SPECIFICATION CHECK:** The contractor shall check all drawings and specifications furnished him immediately upon their receipt and shall promptly notify the Government of any discrepancies. Numbers marked on drawings shall in general be followed in preference to scale measurements. Large scale drawings shall in general govern small scale drawings. The contractor shall compare all drawings and verify the data before laying out the work and will be responsible for any errors that might have been avoided thereby.
- 1.2.5 CONTRACTOR'S SITE VERIFICATION CHECK:** The contract requires the interface of new material/equipment with existing equipment in the building. The contractor is responsible for on-site verification of existing conditions. The contractor is responsible for the integration of new equipment into existing spaces, and the interface of new equipment with existing systems, such as gas, electrical, water, etc. Prior to the submission of the Final Design, the contractor is responsible for visiting the site to facilitate layout of the work.
- 1.2.6 STANDARD PRODUCTS:** Whenever practical, use will be made of materials and equipment that are standard catalog products of manufacturers regularly engaged in the production of such materials and equipment and shall be the manufacturer's latest standard design that complies with the specification requirements. Where two or more products of a similar type are used, they will be products of the same manufacturer. Where two or more products are of a similar type that the same manufacturer's model number can be used, all the products shall be identical. Where standard products are available which have been proven successful for hyperbaric application, they shall be used. Each major component used in this installation will be clearly marked so that the manufacturer, model, serial number,

and the principal characteristics of the item can readily be determined.

1.2.7 DOCUMENT SUBMITTAL SCHEDULE: The following is a summary of the documents that are required to be submitted to the Government. Five copies of each document shall be submitted. Document descriptions are in Part 5, "Quality Assurance". Piecemeal submittal of documents is unacceptable; such submittals shall be returned. Submittals shall be completed and delivered no later than the dates listed below:

a. 60 Days After "Start Work Date":

1. Preliminary Design Package.
2. Quality Assurance Plan (submitted with only first appendix package).
3. Preliminary System Manual Outline (where applicable).
4. Weld Procedures, Welders Qualification and Welder Qualification Records (where applicable).
5. Functional Test Plan, Painting Plan, Hydrostatic Test Plan, Cleaning Procedures and Plan; and gas sample procedures and plan (each where applicable).
6. 80% System Manual.
7. 50% Contractor's Records and Documents.
8. 80% Component Database/Component Manufacturer's Design Data (CMDD).
9. Demolition Plan.

b. 30 Days Before Contract Completion Date:

1. Record Drawings.
2. 100% Contractor's Records and Documents.
3. 100% Component Database/Component Manufacturer's Design Data (CMDD).
4. Final System Manual.
5. Gas Sample Reports.
6. Functional Test Records & Reports.
7. Purchase Orders

c. Monthly Report: Each Monthly Submittal shall be delivered no later than 10 days after the beginning of each month and shall include:

1. Project Schedule.
2. Component database (latest revision).
3. Current Progress Report.
4. Drawing Status Report

1.2.8 HYPERBARIC FACILITY CODES AND STANDARDS: The contractor's designs and all other work provided under this contract must assure in all instances that the finished hyperbaric facility conforms to the codes and standards listed below. Areas of conflict shall be brought to the attention of the Government.

The issue of the respective code to be used for this contract is the effective code at the time of signing of the contract.

- a. NAVSEA SS521-AA-MAN-010, "U.S. Navy Diving And Manned Hyperbaric Systems Safety Certification Manual".
- b. NAVSEA SS521-AG-PRO-010, "U.S. Navy Diving Manual".
- c. UFC 4-159-01N, "Hyperbaric Facilities Design Manual".
- d. NFPA 99, "Health Care Facilities".
- e. TMCHENG/05-010-SCA, "Hyperbaric Facility Pressure Vessels and relief valves".
- f. NAVSEA S6430-AE-TED-010, "Technical Directive for Piping Devices and Flexible Hose Assemblies".
- g. ANSI B31.1, "Power Piping"
- h. ANSI/ASME PVHO-1 "Safety Standard for Pressure Vessels for Human Occupancy"

1.2.9 REFERENCE SOURCES: Reference publications are cited throughout this specification. The addresses of the sponsoring organizations are listed below, and if the source of the publications is different from the address of the sponsoring organization, that information is also provided.

- a. Military Standards (MIL-STD-, MIL-V-, MIL-Q-, etc.) can be ordered from the following address:

Standardization Documents Order Desk
Building 4 D
700 Robbins Ave
Philadelphia, PA 19111-5094

or

General Services Administration
Specifications and Consumer Information
Distribution Sections (WFSLS)
Washington Navy Yard
Building 197
Washington, DC 20407

- b. Navy/NAVSEA Publications:
Navy Publications and Forms Center
5801 Tabor Ave.
Philadelphia, PA 19120
- c. American National Standards Institute (ANSI)
1430 Broadway
New York, New York 10018
Ph: 212-354-3300

- d. American Society for Testing and Materials (ASTM)
1916 Race Street
Philadelphia, PA 19103
Ph: 215-299-5400
- e. American Society of Mechanical Engineers (ASME)
345 East 47th Street
New York, New York 10017
- f. Compressed Gas Association, INC. (CGA)
1235 Jefferson Davis Highway
Arlington, VA 22202
Ph: 703-979-0900
- g. American Welding Society (AWS)
2501 N.W. 7th Street
Miami, FL 33125
Ph: 305-443-9353
- h. Department of Defense (DoD) publications can be ordered from
the following address:

US Army Adjutant General Publications Center
2800 Eastern Boulevard
Baltimore, Maryland 21220
Ph: 301-671-2533
- i. National Fire Protection Association (NFPA)
1 Batterymarch Park
P.O. Box 9101
Quincy, MA 02269-9101
Ph: (617) 770-3000
- j. US Army Corps of Engineers (EM 385-1-1)
Department of the Army
US Army Corps of Engineers
Washington, DC 20314-1000
- k. National Electrical Manufacturers Association (NEMA)
1300 N. 17th Street, Suite 1752
Rosslyn, VA 22209
- l. The Society for Protective Coatings (SSPC)
40 24th Street, Sixth Floor
Pittsburgh, PA 15222

1.2.10 SECURITY REQUIREMENTS: No employee or representative of the contractor will be permitted on Government property unless he/she furnishes satisfactory proof that he/she is a citizen of the United States or is specifically authorized admittance by the Government.

1.2.11 STATION REGULATIONS: The contractor and his employees and subcontractors shall become familiar with and obey all station regulations including fire, traffic, safety and security

regulations. All personnel employed on the station shall keep within the limits of the work and avenues of ingress and egress. Personnel shall not enter any restricted areas unless required to do so and must be cleared for such entry. The contractor's equipment shall be conspicuously marked for identification. A Hot Work chit is required from base Fire Department prior to commencement of subject Hot Work performed at the Facility and a "Designated Fire Watch" and appropriate required equipment will be provided by the Contractor.

1.2.12 ACCESS TO BUILDING: Regular working hours shall be an 8 ½ hour period established by the Government between 7 a.m. and 5 p.m. Monday through Friday, excluding Government holidays. If the Contractor decides that it will be necessary to conduct work outside regular hours or on Saturdays, Sundays, or holidays, at any of the Government sites identified in the delivery orders issued, the contractor shall submit a written request to the Government a minimum of fifteen (15) calendar days prior to the desired access dates/times. Such requests, if authorized, shall allow ample time to enable satisfactory arrangements to be made by the Government to authorize such work and for inspecting the work in progress. At night, the contractor shall light the different parts of the work in an approved manner. All utility cut-overs shall be made after normal working hours or on weekends. No additional costs shall be authorized for such work.

1.2.13 GOVERNMENT ACTIVITIES: The Government will continue its normal activities during the contractor's work at the site, and the contractor shall carry on work with the least possible interference to Government activities. The contractor shall schedule work as to cause the least amount of interference with naval facility operations. Work schedules shall be discussed with naval activity personnel as required. Permission to connect or interrupt any roads, railroads and/or utility service shall be requested in writing a minimum of 30 calendar days prior to the desired date of interruption. The contractor shall make reasonable efforts to provide secure boundaries and sign postings around the designated work site to prevent entry of unauthorized personnel and vehicles.

1.2.14 EXISTING CONDITIONS AND EXTRA OBLIGATIONS OF THE CONTRACTOR: the contractor will be working in a specified section of the building. All other sections of the building other than the hyperbaric sections will be off limits to contractor personnel. The contractor and his employees will not be allowed outside the work area or in adjacent existing buildings without prior approval of the COR. The contractor shall not use the existing buildings for storage.

1.2.15 AVAILABILITY AND USE OF UTILITY SERVICES: The Government will furnish standard utility services free of charge for the specified installation work and on-site testing. Unique utility requirements are the responsibility of the contractor.

- 1.2.16 STORAGE AREAS:** Unsecured outside space, not to exceed 1500 ft², will be available at the site for use as a storage area. All storage facilities, at the contractor's own expense and in a manner satisfactory to the COR, shall be installed, maintained, and removed prior to the final acceptance of the work. Exact location for storage and work areas shall be provided to the contractor upon award of the contract.
- 1.2.17 COOPERATION WITH SDVT1 PERSONNEL:** Unit operations cannot be interrupted. The contractor shall coordinate and schedule his work to avoid conflict with and interruption of the work of others insofar as practicable. In the case of conflict with normal operations that cannot be resolved satisfactorily, the matter shall be referred to the Contracting Officer for decision, and such decision shall be final, subject to right of appeal in accordance with the terms of the contract.
- 1.2.17 REPAIR AND RESTORATION:** If the contractor, during performance of the work described herein, causes damage to other features or existing elements of the described hyperbaric facilities or components or adjacent areas of Facility, the damage shall be repaired and restored to its original condition using similar methods and identical finish, at the Contractor's expense.
- 1.2.18 HAZARDOUS MATERIALS HANDLING:** The contractor is responsible for submitting a list of all Hazardous Materials proposed for use within the scope of the contract. This is including the Material Safety Data Sheets (MSDS) for each separate component, a minimum of 14 days prior to scheduled usage of the materials to the COR and the Resident Officer in Charge (ROICC) to obtain government approval. All contracting personnel involved in the "on-site" contract performance and or administration must attend a Base Environmental Brief, prior to the start of any work. This can be arranged by the Command Engineering Department or Supply Department personnel through the Base. All Hazardous materials used and waste generated in the course of the contract that are or must be removed from the Facility and Navy Base, and must be disposed of in the manner as specified by the State code for disposal of non-hazardous and hazardous materials. The contractor is responsible for obtaining the DOT approved shippable containers used to transport the HAZMAT/HAZWASTE receiving facility. Documents signed by the receiving facility once the material reaches its final destination need to be returned to the Command Engineering Officer and copies forwarded to the Base Environmental Office, for reporting purposes.
- 1.2.19 WEIGHT HANDLING:** The contractor shall comply with specific activity regulations pertaining to crane safety and operation (including allowable access routes and ground loading limitations) and shall notify the KO or COR in advance of any cranes entering the activity, or of any multi-purpose machines, material handling equipment, or construction equipment that may be used in a crane-like application to lift suspended loads. The contractor is

required to comply with applicable American National Standard Institute (ANSI) or ASME standards (i.e., ASME B30.5 for mobile cranes, ASME B30.22 for articulating boom cranes, ASME B30.3 for construction tower cranes, and ASME B30.8 for floating cranes, ASME B30.9 for slings, ASME B30.20 for below the hook lifting devices, ASME B30.26 for rigging hardware, and ANSI/ITSDF B56.6 for rough terrain forklifts). Cranes, machines, and rigging equipment at a naval activity, DoD activity, NAVFAC EXWC project site, or in a foreign country shall comply with the appropriate host country safety standards. Barge-mounted mobile cranes require a third party certification from an Occupational Safety and Health Administration (OSHA) accredited organization (or a third party certification from a state accredited organization for those states with OSHA approved state plans), a load indicating device, a wind indicating device, and a marine type list and trim indicator readable in one-half degree increments. Third party certification is not required for barge-mounted mobile cranes at naval activities in foreign countries.

1.2.19.1 WEIGHT HANDLING CERTIFICATE OF COMPLIANCE: The contractor shall supply a certificate of compliance; reference (a), Appendix P, Figure P-1 that the crane (or other machine if used to lift suspended loads) and the rigging equipment meet applicable OSHA and ANSI/ASME regulations citing the OSHA and ANSI/ASME regulations which are applicable (e.g., cranes/multipurpose machines used in cargo transfer will comply with 29 CFR 1917; cranes/multi-purpose machines used in construction, demolition, or maintenance shall comply with 29 CFR 1926; cranes/multi-purpose machines used in ship building, ship repair, or ship breaking shall comply with 29 CFR 1915; slings shall comply with ASME B30.9, and rigging hardware shall comply with ASME B30.26). For cranes (or other machines used to lift suspended loads) and rigging equipment at naval activities in foreign countries, the contractor shall certify that the crane (or other machine) and the rigging equipment conform to the appropriate host country safety standards. The contractor shall also certify that all of its crane (or other machine) operators working on the naval activity have been trained not to bypass safety devices (e.g., anti-two block devices) during lifting operations. The certifications are required to be posted on the crane.

1.2.19.2 CRANE OPERATOR QUALIFICATION: For mobile and commercial truck mounted cranes with OEM rated capacities of greater than 2000 pounds, the crane operator is required to be qualified by a source that qualifies crane operators (i.e., a union, a government agency, or an organization that tests and qualifies crane operators). Proof of current qualification shall be provided. Operators of cranes used in construction at activities under U.S. jurisdiction follow the qualification and certification requirements of 29 CFR 1926.1427. The contractor is required to certify (in accordance with NAVFAC P-307 Management of Weight Handling Equipment, Appendix P, Figure P-1) that the operator is qualified and trained for the operation of the crane or machine to be used.

1.2.19.3 CRANE QUALIFICATION: Proof or authorization from the machine OEM that the machine is capable of making lifts of loads suspended by rigging equipment is required for all multi-purpose machines, material handling equipment, and construction equipment used to lift loads suspended by rigging equipment. The contractor is required to demonstrate that the equipment is properly configured to make such lifts and is equipped with a load chart.

1.2.19.4 HOOKS: All hooks used on cranes, hoists, other machines, and rigging gear are required to have self-closing latches or the throat opening will be "moused" (secured with wire, rope, heavy tape, etc.) or otherwise secured to prevent the attached item from coming free of the hook under a slack condition. The following exceptions apply and will be approved by the contractor's technical organization; items where the hook throat is fully obstructed and not available for manual securing and lifts where securing the hook throat increases the danger to personnel such as forge shop, dip tank, or underwater work.

1.2.19.5 CRITICAL LIFT PLAN: A critical lift plan is required for each of the following lifts:

- A. Lifts over 75 percent of the capacity of the crane, hoist, or other machine (lifts over 50 percent of the capacity of a barge mounted mobile crane's hoists) at any radius of lift
- B. Lifts involving more than one crane, hoist, or other machine
- C. Lifts of personnel (lifts of personnel suspended by rigging equipment from multi-purpose machines, material handling equipment, or construction equipment is not permitted)
- D. Lifts in the vicinity of overhead power lines
- E. Erection of cranes
- F. Lifts involving non-routine rigging, operation sensitive equipment, or unusual safety risks

1.2.19.6 CRITICAL LIFT PLAN (CON'T): The Critical Lift Plan will include the following as applicable:

- A. The size and weight of the load to be lifted, including crane (or other machine) and rigging equipment that add to the weight (The OEM's maximum load capacities for the entire range of the lift shall also be provided.)
- B. The lift geometry, including the crane (or other machine) position, boom length and angle, height of lift, and radius for the entire range of the lift (This is applicable to both single and multiple crane/machine lifts.)
- C. A rigging plan; showing the lift points, rigging equipment, and rigging procedures
- D. The environmental conditions under which lift operations are to be stopped
- E. For lifts of personnel, the plan shall demonstrate compliance with the requirements of 29 CFR 1926.1431
- F. For barge mounted mobile cranes, barge stability calculations identifying crane placement/footprint; barge list and trim based on anticipated loading; and load charts based on calculated list and trim specific to the barge the crane is mounted on (The

amount of list and trim shall be within the crane manufacturer's requirements.)

G. For lifts in the vicinity of overhead power lines (i.e.; if any part of the crane or other machine; including the fully extended boom of a telescoping boom crane or machine; or the load could approach the distances noted in reference (a), Figure 10-3 during a proposed operation), the plan shall demonstrate compliance to 29 CFR 1926.1408-1411

- 1.2.19.7 WEIGHT HANDLING ACCIDENT NOTIFICATION:** The contractor is required to notify the KO or COR as soon as practical, but no later than four hours after any WHE accident. The contractor is required to secure the accident site and protect evidence until released by the KO. The contractor is required to conduct an accident investigation to establish the root cause(s) of any WHE accident. Crane operations shall not proceed until cause is determined and corrective actions have been implemented to the satisfaction of the KO. The contractor is required to provide the KO, within 10 days of any accident, a Crane and Rigging Gear Accident Report using the form provided in section 6 consisting of a summary of circumstances, an explanation of causes(s), photographs, and corrective actions taken.
- 1.2.19.8 SIGNAL PERSONS:** The contractor is required to certify in the return proposal that signal persons used in construction work are qualified in accordance with 29 CFR 1926.1428.
- 1.2.20 KEY PERSONNEL:** Personnel who are important to the performance of this project are to be identified in the proposal for the contract. Provide detailed resumes for all proposed key personnel that demonstrate their capability to perform the specific tasks as described in the Statement of Work. Provide a key personnel matrix which includes a summary description of the education, background, experience and capability of all proposed key personnel as it relates to the Work Statement. The workforce must be sized to be able to handle the scope of the project. The key personnel workforce must contain welders, technicians, and cleaning personnel who meet the qualification requirements to perform the required procedures of the statement of work.

END OF SECTION

PART C2

2. OPERATIONAL REQUIREMENTS: The facility shall be designed to perform the following operations. **See Part C6 for specific component requirements.**

2.1 MK25/16 CHARGING SYSTEMS: The air system must be capable of providing breathing air for use to drive the MK25/MK16 oxygen booster pump. The oxygen is the medium for charging the MK25/MK16 bottles.

- a. Charge Capacity: 10 flasks simultaneously to 3000 psig
- b. Charge rate: 200 psig per minute

2.2 VEHICLE CHARGING SYSTEM:

- a. One 7.5 cuft. Flask to 3000 psig
- b. Charge Rate 200 psig per minute

2.2 COMPRESSORS AND AIR STORAGE: Air shall be provided to the Compressor Room for Vehicle Charging, SCUBA Charging air, and LP Drive air to the MK25/MK16 Booster Pump. The system shall be configured to include:

- a. Compressors (2 each): 35 SCFM at an output pressure of 6000 psig
- b. Air Bank (2 each): Each of the two air banks shall consist of two (2) 25 ft³ (floodable volume) flasks

2.3 VEHICLE CHARGING STATIONS: The SECUMAR Vest Charging Station shall meet the following requirements:

- a. Charging Capacity: 8.8 CUFT.(floodable volume) at 5500 psi from two connections
- b. Charging rate: 200 psig/min (dry charge rate)

2.4 SCUBA CHARGING SYSTEM: The SCUBA Charging Station shall be capable of meeting the following requirements.

- a. Charging Capacity: 10 sets of SCUBA simultaneously
- b. Charging rate: 400 psig/min (wet charge rate)

2.5 SURFACE SUPPLIED DIVING SYSTEM: The Surface Supplied Diving System (SSDS) shall be capable of working with the existing GFE umbilicals and MK-20 diving masks.

- a. Supply Pressure to Umbilicals: Variable from 90 psi to 120 psi.
- b. Volume Tank Floodable Volume: 60 gallon

2.6 MAINTENANCE PANEL AND OUTLETS

- a. Input Pressure: 6000 psi.
- b. Output Pressure: 3000 psi (at three outlets)

2.7 CLEAN ROOM NITROGEN SUPPLY PIPING

- a. Design Pressure: 3000 max.

END OF SECTION

PART C3

3.0 PIPING & INSTRUMENTATION TECHNICAL REQUIREMENTS

3.1 GENERAL REQUIREMENTS:

- 3.1.1 "POWER PIPING":** Hyperbaric piping, valves and components shall conform to the requirements of ANSI B31.1, "Power Piping". This specification refers to paragraphs in B31.1; the referenced B31.1 paragraph numbers are followed by an asterisk for identification purposes (illustration, "Paragraph 100.1.1*"). The piping, valves and components shall conform to the following additional requirements.
- 3.1.2 PIPING:** Paragraph 100.1.1* Scope-After "This code prescribes minimum requirements for the design, material, fabrication, erection, test and inspection of...." add, "Hyperbaric Facilities". "Piping" is defined in paragraph 100.1.1*; piping includes tubing. Whenever pipe is stated in this specification in general terms (i.e., only pipe joints), it shall be assumed to state a requirement for all pipe and tube used.
- 3.1.3 PROVEN COMPONENTS:** Pressure containing components normally covered by ANSI B31.1 shall be in accordance with paragraph 104.7*, therein "components shall be used that have been proven satisfactory by successful performance under comparable US NAVY service conditions". Components for a hyperbaric facility must have proven experience in existing hyperbaric facilities for high and low pressure air, oxygen and water service. Pressure vessels (other than the PVHO's) shall meet the requirements of ASME, Section VIII, Division 1 or as specified.
- 3.1.4 MATERIAL & COMPONENTS, GENERAL:** Material, components and equipment installed in the piping systems shall be as specified and suitable for the gasses and liquids contained and for the maximum operating temperature and pressure. All valves shall be placed so that they can be easily reached, operated and maintained by a person without extensive system disassembly or the aid of special equipment, such as ladders, or they shall be provided with other means of mechanical operation. Valves shall be placed so that accompanying gauges or other displays are easily read. Pipe and tubing shall be protected from abuse and accidents and be placed for ease of operation, maintenance and replacement.
- 3.1.5 CALIBRATION:** All measuring instruments, gauges, relief valves, process control transmitters, indicators, etc. shall be calibrated. All these items requiring calibration shall have at least twelve months remaining on their respective calibration at the time of the acceptance of the facility. All calibration shall be conducted by a Met-Cal certified calibration shop.
- 3.1.6 MATERIAL PROTECTION:** Equipment and materials shall be properly stored, adequately protected and carefully handled to prevent contamination or damage before and during installation. Equipment

and materials shall be installed, handled, stored and protected in accordance with the manufacturer's recommendations.

- 3.1.7 PERSONNEL PROTECTION:** Belts, pulleys, chains, gears, couplings, projecting setscrews, keys and other rotating parts located so that any person can come in close proximity thereto shall be fully enclosed or properly guarded. High temperature equipment and piping so located as to endanger personnel or create a fire hazard shall be properly guarded or covered with insulation. Areas of high noise shall be properly posted and adequate safety equipment shall be supplied. Electrical connections so located as to endanger personnel shall be fully enclosed or properly guarded. Areas of high noise exceeding 84dB shall be properly posted.
- 3.1.8 MANUFACTURER INSTRUCTIONS:** Where installation procedures or any part thereof are required to be in accordance with the recommendations of the manufacturer of the material being installed, printed copies of these recommendations shall be furnished to the COR with the Preliminary Design Submittal. Installation of the product shall not be allowed to proceed until the recommendations are received. Failure to furnish these recommendations can be cause for rejection of the material.
- 3.1.9 O-RING SEALS:** All piping components such as valves, check valves, relief valves, reducers, and similar equipment, shall be installed with O-ring seal unions.
- 3.1.10 CHASES:** All piping and electrical conduit shall run in chases. The chases shall be located so that they do not interfere with operations or maintenance. In Hyperbaric operating spaces the piping, conduit and chases shall be run so as to be of minimal presence to the operators and chamber occupants. The contractor's design shall conform to component manufacturers' requirements.
- 3.1.11 PIPING, GENERAL:** There shall be adequate joints for disassembly, cleaning and inspection. Single lengths of piping shall not exceed 30 feet between unions.
- 3.1.12 PIPING SIZE:** Piping shall be sized to a maximum gas velocity of .8 mach or less.
- 3.1.13 WELDED PIPING AND FITTINGS:** Piping, unless otherwise specified, shall be seamless annealed stainless steel conforming to ASTM A312, Type **316L**. Pipe shall be 1/2" or larger. All tube, unless otherwise specified, shall be seamless annealed stainless steel conforming to ASTM A269, Type **316L**. All fittings shall conform to ASTM A403, Type **316L** and shall be seamless. Tube shall be 1/2" I.D. or larger, except gauge and sampling lines which will be 1/4" or larger. Traceability details (heat numbers etc.) shall be etched or permanently marked on all piping (pipe, tube, fittings, tailpieces, threadpieces, etc).
- 3.1.14 PIPE MATERIAL CERTIFICATIONS:** The contractor shall submit material certifications for all weld filler metal (wire, rods, etc.), pipe and fittings used in this contract. The material certifications

shall ensure that the pipe, fittings and filler meet all specification requirements. The material certifications shall include, but are not limited to: complete analysis (chemical element percentage composition), mechanical physical properties including tensile, yield, elongation, and manufacturer and manufacturing details. Vendor supplied purchase orders, Vendor Certificates of Conformance (C of C) and Mill Certs for welded pieces shall accompany all piping (pipe, tube, valves and fittings) IAW US Navy System Certification Manual, SS521-AA-MAN-10.

- 3.1.15 JOINT STANDARDS:** Only pipe joints that are fabricated, erected, tested and inspected to nationally accepted standards may be used (typically; butt welds, socket welds, bolted flange connections, O-ring faced fittings). Others are not acceptable (typically; brazed, byte type, flared, compression fittings and threaded).
- 3.1.16 FLEX HOSES:** Flexible hoses shall be installed at reciprocating machinery. When a flexible hose is to be subjected to considerable vibration or flexing, sufficient slack shall be provided to avoid mechanical loading. Flexible hose burst pressure shall be four times operating pressure. Flexible hoses shall be installed so that operators of the equipment are not endangered. All flexible hoses installed shall be labeled with a metal information tag according to the requirements in the US Navy System Certification Manual, SS521-AA-MAN-010. All flex hoses shall have an independent identification number etched on the metal identification tag and on one of the end fittings. This identification number shall correspond to all documentation related to the respective flex hose (hydrotest, cleaning, etc.) All flexible hoses shall be subjected to a hydraulic proof test equal to twice the rated working pressure of the hose (See NAVSEA S6430-AE-TED-010). All flexible hoses shall be covered with non-corrosive stainless steel wire braid. All fittings shall be constructed of non-corrosive stainless steel.
- 3.1.17 FLEX HOSE RESTRAINER:** All flex hoses shall have restrainers (Safety Lines), fabricated in accordance with the U.S. Navy Diving Manual. Safety lines shall be provided for the full length of each flex hose assembly securely fastened at both ends. In the case of charging whips, the manifold end shall be securely fastened. The working end shall have a device for securing the line to the cylinder.
- 3.1.18 FITTINGS ID:** The inside diameter of elbows, tees and other fittings shall be equal to or greater than the pipe to which they are attached.
- 3.1.19 PIPING ID:** Identify piping in accordance with the table listed below. Identification shall apply to piping on each segment of pipe between fittings. All valve handles, operator controls and gauge outer rings shall have color coding applied. Provide two copies of the piping identification code framed under glass or acrylic and installed where instructed by the COR.

Helium

Buff

Oxygen	Green
Helium-Oxygen Mix	Buff & Green
Nitrogen	Light Gray
Nitrogen Oxygen Mix	Light Gray & Green
Exhaust	Silver
Air (Low Pressure)	Black
Air (High Pressure)	Black
Chilled Water	Blue & White
Hot Water	Red & White
Potable Water	Blue
FES	Red
Variable Mixed Gas	Orange

3.1.20 COMPONENT TAGS: All components shall be tagged with identification plates of plastic laminate measuring approximately on half inch high, by one and one half inches long minimum, by one eighth inch thick, firmly attached by contact adhesive or by other means acceptable to the Government. These plates shall be marked by engraving with one quarter inch high block type identification letters/numbers, and shall be color coded as appropriate. The Component Tag index shall be submitted with the Preliminary Design.

3.1.21 COMPONENT ID PLATES: On the component identification plates, the first set of symbols shall identify the component; the second set shall identify the system; and the third set shall indicate the number of that component in the system. For example, BV-ALP1-3 indicates that the component is a ball valve in the Air Pressurization System and that it is a ball valve #3. The following is a component list and the symbols for each:

Components:

AC.....	Air Compressor
AP.....	Air Purifier/Drier
3BV.....	Three Way Ball Valve
GCV.....	Gauge Calibration Valve
BV.....	Ball Valve
CV.....	Check Valve
F.....	Filter
GV.....	Globe Valve
HF.....	High Pressure Flask
MS.....	Moisture Separator
NV.....	Needle Valve
PG.....	Pressure Gauge
PR.....	Pressure Regulator
RV.....	Relief Valve
VT.....	Volume Tank
PS.....	Pressure Switch
SV.....	Solenoid Valve
SCV.....	Stop Check Valve
QD.....	Quick Disconnect
FH.....	Flex Hose
EBV.....	Electric Ball Valve

Systems:

AHP1.....High Pressure Air Bank #1
 ALP1.....Low Pressure Air Bank #1
 AHP2.....High Pressure Air Bank #2
 ALP2.....Low Pressure Air Bank #2
 OX.....Oxygen System
 DS.....Diluent System
 NS.....Nitrogen System

- 3.1.22 PANEL ID TAGS:** All panels and major subsystems shall be identified with an ID plate. These plates shall be made of plastic laminate, two inches high and at least six inches long by one-eighth inch thick. The plates shall be marked by engraving with three-quarter inch high block type identification letters/numbers, and shall be color coded as appropriate. All piping entering/leaving a panel shall be identified. These plates shall be made of plastic laminate, 1 1/2 inches high and at least four inches long by one-eighth inch thick. The plates shall be marked by engraving with 1/2-inch high block type identification letters/numbers, and shall be color coded as appropriate. These labels shall be firmly attached by contact adhesive or by other means acceptable to the Government. ID tag wording shall be provided with the Preliminary Design.
- 3.1.23 TUBING GUIDELINES:** There shall be a length of straight tubing adjacent to the nut equal to 2 tube diameters or more. The total length of a tube assembly shall be 20 tube diameters or more. Each tube assembly shall have at least one bend equal to or greater than 90°.
- 3.1.24 THROTTLE VALVES:** All valves that regulate flow (other than on-off function), oxygen service valves, and high pressure valves (except for those remotely actuated) are considered throttle valves. They shall be globe or needle valves. These valves shall conform to MIL-V-24109. For throttle valves which are larger than those that meet the requirements of MIL-V-24109 (3" or greater), these valves shall conform to MIL-V-24109 with respect to control of flow and pressure. Handles shall color coded IAW paragraph 3.1.19.
- 3.1.25 SHUTOFF VALVES:** All hand operated valves, other than throttling valves, shall be ball valves. They shall be two-way (bi-directional) flow, three-piece, with a swing out construction, valves conforming to ASME/ANSI B-16.34 and utilizing a soft sealing surface. Socket weld end connections shall conform to ANSI B-16.11. Butt weld end connections shall conform to ANSI B-16.25. The construction materials shall be compatible with air and oxygen service. All valves shall be rated at a working pressure equal to or greater than the maximum possible system pressure. On panels, in which the direction in which the valve handles point indicates the open or closed position, the direction shall be the same for all valves on the panel. Handles shall color coded IAW paragraph 3.1.19.
- 3.1.26 COMPONENT SEATS:** Breathing gas components shall have seats and seals that are suitable for oxygen service.

- 3.1.27 LUBRICANTS:** All lubricants shall be suitable for oxygen service in accordance with MIL-STD-1330D.
- 3.1.28 CHECK VALVES:** All check valves shall utilize a soft sealing surface poppet or disc and spring.
- 3.1.29 PRESSURE GAUGES:** Pressure gauges, except as otherwise specified, shall have a 4 1/2 inch dial and shall meet the following criteria:
- a. Unless otherwise specified, shall be made with phosphor bronze or stainless steel, with helical coil or bourdon tube sensing elements.
 - b. The case shall be made of acrylonitrile butadiene styrene plastic and shall have a blowout relief device.
 - c. Oxygen gauges shall be cleaned and marked for oxygen service.
 - d. Oxygen gauges shall have a green outside case.
 - e. Each gauge shall be capable of isolation from the system by a three-way gauge calibration valve, which meets the requirements of MIL-V-24578, and snubber assembly.
 - f. They shall have an accuracy of 1% full scale unless otherwise specified.
 - g. Gauge Rings & covers shall be color coordinated with paragraph 3.1.19.
- 3.1.30 GAUGE RANGE:** The full range of pressure gauges shall be 130% to 150% of the maximum operational range.
- 3.1.31 VENT LINES:** Vent lines shall be independent of each other and of other lines. All vents lines shall exhaust outside the building, and shall be so configured and capped to prevent ingress of weather or debris. They shall be designed to provide lightning protection.
- 3.1.32 RELIEF VALVES:** Relief valves installed on PVHO's and on ASME air storage flasks shall conform to and be marked and stamped in accordance with ASME Section VIII, Division 1, "Pressure Vessels". Non ASME coded relief valves shall be installed on systems other than PVHO's and ASME storage flasks. Relief valves shall be located so that the exhaust port is not nearer than 5 feet from operators, the vented gas shall be directed away from operators. Relief valves for piping greater than 1" NPT and for oxygen shall be piped outdoors. All non-ASME coded relief valves shall be adjustable-type relief valves. Relief Valves subject to retesting shall be tested in accordance with TM-CHENG-05-010-SCA.
- 3.1.33 PIPING CLEANING:** Piping shall be installed to facilitate cleaning. All high points shall be ventable, low points shall be drainable.
- 3.1.34 REDUCTION STATIONS:** Pressure regulating station components shall be selected so that output pressure will not drop below 90% of nominal set pressure for all conditions of flow and upstream pressure; and, maximum flow requirements shall be met under all conditions of upstream pressure and flow. Minimum upstream pressure shall be three times downstream pressure. Provide each pressure reducing

station with a regulator, a filter upstream of the regulator, gauges to show the supply pressure, reduced pressure and a safety relief valve on the low pressure side with sufficient capacity to relieve the high pressure. Pressure regulators shall be capable of operating within a temperature range of 32 to 165 degrees Fahrenheit. All dome-loaded regulators shall be provided with appropriate hand loaded regulators for the adjustment of the reduced pressure downstream of the dome-loaded regulator. The exception for filters shall be that no filters shall be provided for maintenance panel or drive air panel regulators. All regulators shall be provided with straight thread o-ring fitting end connections.

- 3.1.35 FILTERS:** Filters shall be provided preceding all pressure regulators, except as noted in the specification or drawings. A filter shall be provided downstream of all externally supplied supply banks ("K bottle banks for oxygen, nitrogen, etc., Liquid oxygen, Liquid nitrogen, etc.) and preceding all dome loaded regulators regardless if not on drawings. All filters, unless otherwise specified, shall be fabricated in accordance with ASME Section VIII Div I, and shall be capable of changing the filter element without removing the filter body from the line. It shall be capable of removing particulate larger than 10 microns unless otherwise specified. Filters shall be sized so that the pressure drop across a clean filter is not more than 2.5 percent for LP systems (500 psi and less) or not more than 15 psi for HP systems (500 psi and more) of the specified minimum inlet pressure to the regulator at maximum flow rate specified for the regulator. All filters shall be provided with straight thread o-ring fitting end connections. All filter media for air shall be sintered stainless steel.
- 3.1.36 UNIONS:** Unions shall be installed in the piping and each end of the flexible hoses to facilitate removal and maintenance of components.
- 3.1.37 CONSOLES:** The surfaces of consoles that are viewed by operators shall be non-reflective. Consoles and modular spaces which contain both oxygen and electrical equipment shall be mechanically ventilated.
- 3.1.38 PANELS:** Control Console's and Control Panels for recompression chambers shall be constructed in a panel mount configuration, with the component bodies behind the panel. **All other panels** shall be constructed in an "exposed component, surface mounted" configuration. Panels and mounting brackets shall be fabricated of aluminum. The panels shall be manufactured of a minimum of 1/4" plate. The exposed panel surface and all brackets shall be powder coated to the required color of the panel service after fabrication. The support brackets used to support the pipe and components shall also be powder coated after fabrication. All components on the panel shall be independently supported (pipe shall not be used to support components). Panels that cannot be supported due to their weight shall be supported with leg supports that adequately support the weight of the panels. Required panels

are noted in each appendix description. The color coding for the panels shall be as followed

- a. Air Pressurization System Supply: Black
- b. Air Pressurization System Vent: Silver
- c. Oxygen: Green
- d. Fire Extinguishing System: Red
- e. Specialty Gas: Buff
- f. Nitrox: Gray

3.1.39 WELD JOINT INTERIOR: Paragraph 111* Welded Joints-The finished interior surface of pipe joints shall be smooth in order to reduce noise in the test piping. Backing rings, if used, shall be removed. There shall be no excess reinforcement on the inside of pipe joints caused by the welding process. Machine welding or consumable inserts shall be used in the welding process to avoid any excess reinforcing of the weld. The contractor shall provide a detail description of the weld process in the preliminary design.

3.1.40 WELDING QUALIFICATIONS: Paragraph 127.5* Qualification. All welders, welding procedures, and procedures shall be qualified by the contractor prior to welding on this project. Qualification by a previous employer is unacceptable. The following documents shall be submitted by the contractor:

- a. QW-482 Welding Procedure Specification
- b. QW-483 Procedure Qualification Record
- c. QW-484 Welder or Welding Operator Qualification Test

3.1.41 WELD IDENTIFICATION: All welds shall have weld identification symbols etched on the pipe base metal adjacent to the respective weld. All etched weld numbers shall correspond to the welder log and Joint Identification Drawing (JID). The welders log and JID shall be submitted by the contractor. The welders log and JID shall contain sufficient information to cross reference between all welding qualifications, welding records, Non-destructive testing (NDT) qualifications, and NDT records. JID etchings will correspond to NDSTC PD-2 Section 32 and 33 requirements.

3.1.42 COMPONENT SUPPORTS: Pipe and/or tubing shall be adequately supported at intervals no greater than 100 pipe diameters, and in both directions at elbows. Components (valves, regulators, etc.) shall be supported so that the force required to operate the component or other normal operational load does not cause visual deflection, rotation nor vibration.

3.1.43 CONTAMINATION: Precautions shall be taken during fabrication to prevent construction dirt from entering pipe in storage or partially completed piping systems.

3.1.44 MACHINERY FOUNDATIONS: Reciprocating machinery shall be on independent foundations, with sound isolation mounts.

3.1.45 COMPRESSOR GROUNDING: Each compressor shall be grounded. Where a ground strap is provided at the isolation pad, the contractor shall

connect the compressor to this strap. If no ground strap is provided, the contractor is responsible for installing such ground strap, and grounding the compressor.

3.1.46 ALARMS: Alarms shall be aural and visual. Visual displays shall be LED and press to test. Each aural alarm shall have a manual shut-off. Illuminated visual alarms and displays shall be grouped as safety related or informational. Safety related alarms and displays shall be GREEN, indicating a safe condition; or RED, indicating an unsafe condition. Informational illuminated visual displays shall be WHITE. They shall indicate data such as "OPEN", "SHUT", etc.

3.1.47 OXYGEN SYSTEMS: Oxygen piping shall conform to the requirements of CGA Pamphlet G-4.4, "Industrial Practices for Gaseous-Oxygen Transmission and Distribution Piping Systems". The following are noted:

- a. Pipe and fittings shall be stainless steel ASTM 316L.
- b. All valves, regulators and other components shall be copper based alloy. All oxygen system valves shall meet the requirements for throttle valves as specified in C3.1.24.
- c. Pipe joints shall be butt welded.
- d. Vent lines shall be independent of other lines and shall vent outdoors. The vent line for venting oxygen shall be cleaned as required by this specification. A sign shall be provided at the point where the vent line exits the building stating "DANGER OXYGEN VENT NO SMOKING".
- e. The oxygen vent shall be properly isolated from weather, combustibles, personnel, other systems and air compressor intakes.
- f. Components for oxygen systems shall not react with oxygen nor fluorinated compounds in any way that might cause generation of heat or loss of oxygen to the surrounding atmosphere. Such components shall utilize polytetra fluoroethylene (teflon), or fluoroethylene (Viton) seals and gaskets. All other wetted parts shall be stainless steel or as otherwise specified.
- g. Gauge and sampling piping provided in oxygen systems which are 1/4" tube may have pipe joints which are socket welded. Gauge and sampling piping lengths and the amount of socket weld fittings shall be kept to a minimum.
- h. All oxygen piping shall be grounded.
- i. All filter body elements shall be manufactured of bronze or monel.

3.1.48 NON-DESTRUCTIVE EXAMINATION: Mandatory minimum non-destructive examination of welds shall conform to the requirements of Table 136.4* and the following.

Dew point analysis shall be conducted that confirms that less than -40°F air is being supplied by the compressors.

- e. Gas samples shall be taken at the discharge of all other pipe gas supplies which may be breathed by humans (oxygen, nitrox, heliox,) or used for mixing of breathing supplies (nitrogen, helium, etc.). The total amount of gas samples taken shall ensure that there is analysis of the entire system. Samples shall be taken after hydrotesting, cleaning and assembly. Purity shall meet or exceed the standards stated in the U.S. Navy Diving Manual (NAVSEA SS521-AG-PRO-010), Table 4-1, 4-2, 4-3, 4-4, or 4-5.
- f. Oxygen system cleaning procedures and Gas sample requirements must comply with the requirements of MIL-STD-1330D.
- g. All gas samples shall be tested for the presence of unacceptable levels of all agents used in cleaning. An acceptable level is any level less than 1/10th the maximum OSHA eight (8) hour exposure level for any constituent in the cleaning material.
- h. If liquid cleaning solutions are used requiring final H₂O rinse, the final rinse solution shall be sampled to insure cleaning agents do not remain in the system.

3.1.50 HYDROSTATIC TEST: Paragraph 137* - Leak Test. Piping shall be hydrostatically strength tested to 1-1/2 design pressure.

3.1.51 GAS LEAK TEST: A gas leak test shall be conducted after the hydrostatic strength test. The test shall be conducted with air unless otherwise specified. The maximum test pressure shall be the Maximum Operating Pressure. The gas pressure shall be permitted to stabilize as a result of temperature change. All possible sources of pressurization and volume storage (tanks, etc.) shall be isolated from the system. High pressure piping and low pressure piping in systems shall be tested independently. The maximum test pressure shall be safely brought to maximum operating pressure and held. After allowing for equalization, a bubble test will be performed. The pressure will then be brought to low pressure (50 psi) and left for an extended period of at least 3 hours. The pressure shall not drop.

3.1.52 MUFFLERS: Unless otherwise specified, mufflers shall be shell type dispersive mufflers with connection size no smaller than associated line size. All mufflers shall be constructed of corrosion resistant stainless steel and all acoustical packing material shall be non-flammable.

3.1.53 INSTALLATION WIRING METHODS: The contractor shall provide insulated conductors installed in conduit, except where specifically indicated or specified otherwise or required by NFPA 70 to be installed otherwise. Insulated, green equipment grounding conductor shall be provided by the contractor and separate from the electrical systems neutral conductor, along with insulated, green conductor for grounding conductors installed in

conduit or raceways. The minimum conduit size shall be 3/4 inch in diameter for low voltage lighting and power circuits. Conduit which penetrates fire walls, fire partitions, or floors shall be metallic on both sides of fire walls, fire partitions, or floors for minimum distance of 6 inches.

3.1.53.1 WIRING: The wiring system, with all of its associated hardware, fittings, and devices, shall be in accordance with NFPA 70 and 79. Unless otherwise specified, interconnecting wiring shall be of any construction complying with NFPA 70 Table 310.104(A) "Conductor Applications and Insulations Rated 600 Volts", except for those types containing asbestos in the insulation or outer covering. Motor branch circuit conductors shall be sized as to have an amperage capacity not less than 150% of the motor full load current rating. Conductor selections shall be selected based on maximum ambient temperature. Raceways shall be ferrous rigid metal conduit; where flexible connections are necessary, liquid-tight flexible metal conduit shall be used. Control panels shall not be used as raceways for conductors not terminating within the panel. A separate grounding wire, sized in accordance with NFPA 70 Section 250.122 "Size of Equipment Grounding Conductors", shall be routed with all ungrounded conductors. All conductors, except for (low voltage shielded conductors) and encoder conductors (if applicable), shall terminate on terminal blocks; there shall be no splices. All wiring shall be numbered or tagged at all connection points. Fittings and boxes shall have threaded bosses for connection of cable terminations. All unused conduit openings shall be plugged.

3.1.53.2 ALUMINUM CONDUIT: Do not install underground or encase in concrete. Do not use brass or bronze fittings.

3.1.53.3 ENERGY ISOLATION DEVICES: The equipment shall be provided with energy isolation devices (e.g. power switches, safety devices, circuit breakers, valves) that protect personnel from the release of hazardous energy. The devices shall be designed and manufactured such that they can be padlocked in the OFF position. This includes both mechanical and electrical devices. An energy isolation device shall be installed as the first energy control device on all major components of the system such that the component can be isolated at the component level.

3.2 SPECIFIC TO PROJECT:

- 3.2.1 DEMOLITION OF EXISTING AIR AND OXYGEN SYSTEMS:** The contractor shall demolish all existing piping, valves, and components from the existing air and oxygen systems at SDVT1, Building 995. The contractor shall remove any associated extraneous wiring, conduit or equipment from the hyperbaric systems. The Contractor shall remove all adjacent pipe supports for this demolition. The only exceptions to this demolition are listed below
- 3.2.1.1 DAMAGE TO EXISTING EQUIPMENT:** Any damage done to any equipment, structures or floor during demolition will be restored to original or better condition by the contractor. Any bare areas left to paint work or floor by removal of piping/equipment shall be restored to match the surrounding paint work.
- 3.2.1.2 DEMOLITION ITEMS TURNOVER AND DISPOSAL:** Upon demolition and removal of materials from SDVT1, the Contractor shall store these items at the site for inspection by the Government. Any materials designated as having future use to the Government will be turned over to the Government. No materials will be disposed of unless it has been determined by the Government that there is no future use for these materials. Materials designated as not having any future use to the Government shall be disposed of by the Contractor.
- 3.2.1.3 CLEANLINESS TO EXISTING SDVT1 FACILITY:** The Contractor shall maintain cleanliness of the facilities from which the demolition is occurring. The Contractor shall take all precautions necessary to not impede the ongoing operations in the spaces where equipment is to be removed.
- 3.2.1.4 DEMOLITION PLAN:** The Contractor shall submit a demolition plan. This plan will be submitted within 60 days after the award of the contract. This plan will include as a minimum:
- a. Demolition figures: showing where demolition is to take place and where the exceptions are noted.
 - b. Any cleaning plans and qualifications, hot work plan and qualifications, or qualifications required to complete the demolition in accordance with the provisions of this contract.
 - c. Identification of the storage space to be used for the removed equipment.
- 3.2.2 INSTALLATION OF AIR COMPRESSION AND STORAGE:** The air compression and storage system shall consist of two high-pressure air compressors, two air purification systems, two high-pressure storage banks, and associated piping and components. Each purifier/dryer shall be capable of operating with either compressor as shown in part C6. The location and configuration shall be as shown in Part C6. The contractor shall install the compressors, flasks, and dryer/purifiers as described below. Installation shall contain all piping, bracketing, mounting, etc to provide a complete and usable system.

A. AIR COMPRESSORS: Two (2) high-pressure compressors shall be combined with its respective air-drying and air purification system within a single manufacturer's system. The high-pressure air compressor/dryer/purifier shall be installed in the Compressor Room. It may be assembled vertical configuration. Each compressor shall have a charging rate as specified in Part C2.1. The compressors shall supply 6000 psig air downstream of the air drying and purification systems. The compressors shall be air-cooled, oil lubricated, four stage, reciprocating piston compressors. They shall be designed for use with ambient operating temperatures between 32°F and 105°F. The compressor shall be grounded by the contractor upon installation.

1. COMPRESSOR FEATURES: Each compressor has, been equipped with the following:

- (a) on/off/auto switch
- (b) power on light
- (c) gauge panel with a gauge for each stage of compression, a running hour-meter, an oil pressure gauge, a discharge air temperature gauge
- (d) magnetic electric motor starter with overload protection and manual reset
- (e) an automatic condensate drain system which automatically drains condensate for a set time period, and an hour meter.
- (f) air pressure switch (start/stop)
- (g) a high temperature shutdown/alarm
- (h) a low oil pressure shutdown/alarm
- (i) a high carbon monoxide monitor with auto shutdown/alarm
- (j) automatic compressor unloading (to allow the compressor to start unloaded)
- (k) safety relief valves on each stage of compression, shear disc safety valve on last stage, final output line check valve.
- (l) NEMA 4 rated electrical enclosure with a vertically hinged front operations panel. The enclosure shall also have lift off side access doors.
- (m) Underwriters Laboratories (UL) listed control panel.

- 2. POWER:** Each compressor is powered by a maximum of a 20 Horsepower, 3-phase electric motor. The compressor contains the required motor starter. Power available in the building is 230/460 VAC, 3-phase, 3-wire, **60 Hz**, capable of operating the compressor. A disconnect switch is provided in the compressor room for each compressor. See Part C6 for details. The contractor is responsible for all electrical work up to and including replacement of breakers, if required.
- 3. COMPRESSOR INTAKES:** The contractor shall provide dedicated compressor intake piping for each compressor. The intake system shall not restrict the flow of air to the compressors. The use of breathing compatible acrylonitrile-butadiene-styrene (ABS) or schedule 10 stainless steel piping is acceptable, and shall be a minimum of four (4) inch. Any bonding adhesives shall be non-offgassing and breathing compatible. Two penetrations in the compressor room wall are provided. Where an overhang roof is provided, two corresponding penetrations in the overhang roof outside the compressor room are also provided. Exterior intake piping shall terminate in a 180° bend that provides the intake opening in the down position and prevents access of moisture into the intake from rain. The opening must be provided with an anti-ingestion device to prevent extraneous matter from entering the intake. The intake shall be located in an area without dead air and not in an area where exhausts from traffic can enter the intakes. There shall be adequate clearance between the air intake piping and the roof to prevent contamination of the air being ingested by off-gassing of the roofing material.
- 4. AIR INTAKE FILTER:** An air intake filter-silencer shall be provided for each compressor and shall be an in-line type completely sealed with replaceable 15 micron dry filter element. It shall be located on or near the compressor. It shall be suitable for outdoor exposure in a salt spray environment.
- 5. DRYER:** The dryer shall be a coalescer type moisture separator with a 0.1 micron filtration efficiency of 99.9999%. The dryer shall be capable of maintaining the Dewpoint of compressed air at less than -40 degrees Fahrenheit. The dryer shall be rated at the maximum output pressure and flow rate of the associated compressor.
- 6. AIR PURIFIER:** An air purification system capable of providing air as specified in part C3.1.49, shall be provided. The purification system shall utilize replaceable cartridge filter elements and shall be capable of processing approximately 150,000 ft³ of air per cartridge set. The design of the cartridge pressure chambers shall eliminate the possibility of operating the system without purification cartridges installed or with improperly installed cartridges. It shall have an electronic purification

monitor with warning light indicator which activates prior to cartridge exhaustion, and which will automatically shut down the compressor when the cartridge is exhausted. Components shall have a working pressure of at least 6,000 psig. The purification chambers shall conform to ASME Code for unfired pressure vessels, Section VIII, Division 1.

7. MOUNTINGS: Mountings shall be provided for the compressor on the provided isolation pad which will limit/eliminate vibration, noise, etc. Suitable sized tie down bolt-holes are provided in sub-base for installation of the compressor. Expansion bolts shall be provided for securing the air compressor package sub-base to the floor.

B. HIGH PRESSURE AIR STORAGE: The contractor shall install the high pressure air storage. The flasks consist of two (2) bank of two (2) flasks, with a minimum of 20 cubic foot floodable volume, capable of air storage at 6000 psig. The flasks shall be fabricated in accordance with ASME Section VIII, division I. The pressure rating of the flasks must be compatible with ASME relief valve requirements. The contractor shall provide a means of mounting the flasks securely in the gas farm area as shown in Part C6, horizontally with a three degree slope towards the drain end. The low point end fitting shall provide an internal tube for water drainage. All valving and manifolding required for air distribution shall be provided see Part C6. There shall be provisions made for connecting a remote high pressure air source, such as a portable air compressor or a portable air flask. There shall be sufficient space around the flasks for internal examination by use of boroscope, and external examinations including ultrasonic thickness measurements.

C. STAINLESS STEEL CABINETS: The contractor shall provide for a stainless steel cabinet for the Flask Panels located in the Gas Farm. The cabinets shall be manufactured of Corrosion Resistant Stainless Steel. The cover shall be capable of protecting all components on the panel from the outside environment. The cover shall completely seal the interior components from the outside when shut by the use of seals, bulkhead unions, etc. The cabinet shall be capable of opening in such a way that it does not affect operations when it is both open and shut.

D. INTERCONNECTING PIPING CHASE COVERS: The contractor shall provide for stainless steel interconnecting piping covers. The contractor shall ensure that all interconnecting piping located in the Gas Farm is covered from salt spray by Corrosion Resistant Stainless Steel Covers. The covers shall have access to the unions in this piping for maintenance.

3.2.3 VEHICLE & MK-25/MK16 OXYGEN CHARGING SYSTEM: The contractor shall design, fabricate, and install an oxygen charging system. The oxygen system shall meet the requirements of part C2.1, and shall

be configured as specified in Part C6. The oxygen charging system shall include:

- A. BOOSTER PUMP:** The contractor shall provide a double acting transfer pump for the MK25/MK16 Charging System. The oxygen charging system shall be equipped with an air operated double acting oxygen transfer pump, as required to meet all requirements of sections C2.1 and C3.1. The transfer pump shall be rated for oxygen service. The station shall be capable of operating with oxygen input pressures from 250 to 3000 psig, and output pressures from 0 to 3000 psig, with an adjustable output pressure limiter. The transfer pump shall be shock mounted on a stand so as to prevent transfer of vibration to the adjacent wall. The transfer pump piping configuration shall be configured as shown in section C6.
- B. AIR SUPPLY FOR BOOSTER PUMPS:** Air from the HP air system shall be used to power the booster pumps. HP Drive Air shall tie into the booster pumps as shown in section C6.
- C. OXYGEN SUPPLY:** The oxygen supply (in the gas farm) shall tie into the O2 Gas Transfer Pump located in the Oxygen Fill Room as shown in section C6.
- D. CHARGING PANEL:** The contractor shall provide the charging panel, which shall be used for the charging of Oxygen bottles, configured and located as specified in section C6. The Oxygen Charging Panel shall consist of a manifold block capable of charging ten (10) flasks simultaneously. The interface between the flask and the manifold shall consist of a female quick disconnect fitting (QD, with check valve), and a flexhose fitted with a male QD fitting on one end and a MK25/MK16 charging fitting on the other. The MK25/MK16 Oxygen Charging Panel shall be located in the High Bay. The Oxygen Charging Manifold and the SCUBA charging manifold shall be located above the MK25/SCUBA Charging Wet Sink in the High Bay.
- E. MK25/MK16/SCUBA WET SINK:** The contractor shall provide a wet sink for charging the MK-25 Bottles, MK16 Bottles, and the SCUBA Bottles. The sink shall have two different sections: One for charging SCUBA bottles; and another, smaller section just above the lower section for charging MK25 and MK16 bottles. The sink for charging the Oxygen bottles shall be sized large enough and deep enough so that the MK25 and MK16 UBA's Oxygen Bottles shall be able to be submerged in water to the neck while being charged. The sink shall include an appropriately sized drain, with drain valve. The contractor is responsible for installation of water to the sink, from the building water supply, and plumbing the sink drain to the appropriate drain. The sink shall be outfitted with overflow protection that drains into the appropriate drain. The sink shall have a means to allow the oxygen bottles to be simultaneously secured with their restrainers that shall be installed on their individual flex hoses.

- F. CHARGING HOSES:** The contractor shall provide ten (10) charging flex hoses with filler devices. Ten (10) filler devices, complete with quick disconnect with check valve, CGA250 fitting, shall be provided as the interface between the charging manifold and the MK25 cylinder. Safety lines shall be provided for the full length of each flex hose assembly; securely fastened at the manifold end, and with a device for securing the line to the SCUBA cylinder. Dust caps will be provided to protect the mating surface filler device.
- G. MK25/MK16 CHARGING PANEL STAINLESS STEEL CABINET:** The contractor shall provide for a stainless steel cabinet for MK25/MK16 Charging Panel located in the High Bay. The cabinets shall be manufactured of Corrosion Resistant Stainless Steel. The cover shall be capable of protecting all components on the panel from the outside environment. The cover shall completely seal the interior components from the outside when shut by the use of seals, bulkhead unions, etc. The cabinet shall be capable of opening in such a way that it does not affect operations when it is both open and shut.
- H. VEHICLE CHARGING PANEL:** The contractor shall provide a vehicle charging panel. The panel shall be configured as shown in section C6. The charging panel shall be fed from the booster pump described above.
- I. VEHICLE CHARGING PANEL STAINLESS STEEL CABINET:** The contractor shall provide for a stainless steel cabinet for Vehicle Charging Panel located in the High Bay. The cabinets shall be manufactured of Corrosion Resistant Stainless Steel. The cover shall be capable of protecting all components on the panel from the outside environment. The cover shall completely seal the interior components from the outside when shut by the use of seals, bulkhead unions, etc. The cabinet shall be capable of opening in such a way that it does not affect operations when it is both open and shut.

3.2.4 SCUBA CHARGING SYSTEM: The contractor shall design, fabricate, and install a SCUBA charging system. The SCUBA system shall meet the requirements of part C2.1, and be configured as specified in Section C6. The SCUBA charging system shall include:

- A. CHARGING HOSES:** The contractor shall provide ten (10) charging flex hoses with filler devices. Ten (10) filler devices, complete with quick disconnect with check valve, SCUBA yoke, vent valve and two foot hose shall be provided as the interface between the charging manifold and the SCUBA cylinder. Safety lines shall be provided for the full length of each flex hose assembly; securely fastened at the manifold end, and with a device for securing the line to the SCUBA cylinder. Dust caps will be provided to protect the mating surface for each yoke.
- B. STAINLESS STEEL CABINET:** The contractor shall provide for a stainless steel cabinet for SCUBA Charging Panel located in the High Bay. The cabinets shall be manufactured of Corrosion

Resistant Stainless Steel. The cover shall be capable of protecting all components on the panel from the outside environment. The cover shall completely seal the interior components from the outside when shut by the use of seals, bulkhead unions, etc. The cabinet shall be capable of opening in such a way that it does not affect operations when it is both open and shut.

3.2.5 HP MAINTENANCE STATION: The contractor shall provide a HP Maintenance Station. The station will reduce the supplied 6000 psi and reduce it to 3000 psi and 250 psi. The panel will feed three (3) SCUBA bottle valve type connections in the Dive Locker fed from the 3000 psi reduction on this panel. The station and its connections shall be configured as shown in section C6, and meet the requirements of section C3.1

3.2.6 VEHICLE CHARGING STATIONS: The contractor shall design, fabricate and install two (2) vehicle charging stations. The station shall meet the requirements of C2 and be configured as specified in part C6. The vehicle charging station shall include:

A. AIR SUPPLY: Air from the HP air system shall be used to charge air flasks various vehicles used by SDVT1. Charging Air shall be configured as shown in section C6.

B. CHARGING PANEL: The contractor shall procure the charging panel, which shall be used for the charging of vehicle air bottles, configured and located as specified in Part C6. The interface between the panel and the vehicle shall consist of a female quick disconnect fitting (QD, with check valve), for the flexhoses described below.

C. CHARGING HOSES: The contractor shall provide two hoses for each of the two Vehicle Charging Stations. Each of these hoses shall be seventy five (75) feet in length. Hoses rated for 5500 psi and 4500 psi air service shall be provided for each station. The contractor shall provide fittings (bland quick disconnect plugs, caps or other fittings) so that cleanliness may be maintained in the flex hoses quickly and easily in between operations.

D. STAINLESS STEEL ROLL UP DOOR CABINETS: The contractor shall provide each of the two Vehicle Charging Stations with Stainless Steel Cabinets with Roll up Doors. The cabinets shall be manufactured of Corrosion Resistant Stainless Steel. The cover shall be capable of protecting all components on the panel from the outside environment. The cover shall completely seal the interior components from the outside when shut by the use of seals, bulkhead unions, etc. The cover shall contain a roll-up door, provided with seals, and be capable of being opened so that it is clear from the operator's area. The roll up door shall be capable of being locked in the "open" and "shut" positions. The cover shall be free-standing and capable of withstanding the stresses of mounting the Diver's Station HP/LP Panel inside. The cover shall be labeled in accordance with the

paragraph "PANEL ID TAGS" and shall read "VEHICLE CHARGING STATION (#)".

3.2.7 SURFACE SUPPLIED DIVING SYSTEM: The contractor shall provide for a surface supplied diving system (SSDS) in accordance with section C3 and configured as shown in the schematics and layout drawings in section C6. The SSDS shall use a Volume Tank, Reduction Panel and Supervisor's Station.

A. GFE UMBILICALS: The SSDS be designed to work with the command's existing umbilicals.

B. VOLUME TANK: The volume tanks shall be a minimum of 60 gallons in volume. The tanks shall meet the requirements of ASME Section VIII, Division 1. Two ports shall be provided on the tank for future maintenance inspections. These ports shall be 4 inch flanges design for the service.

C. DIVE SUPERVISOR'S CONSOLE: A Dive Supervisor's Console, compete with a communications system shall be provided for the Pool Divers' System. The Dive Supervisor's Console shall include a "writing table" area for writing and maintaining log books during pool use. The console shall be fabricated in accordance with paragraph 3.1.38, "panels". The Dive Supervisor's Control Console shall be painted light blue in color.

D. COMMUNICATION'S SYSTEM: The communications system shall allow communications between the Dive Supervisor and the three diver's on umbilicals in the Pool. The system shall use a standard page/talk communications. The system shall be powered by standard 110 VAC power during normal operations and shall contain an integral battery power system for emergency use. The contractor shall provide all wiring and connections necessary for connection with the diving rigs through the umbilicals. A headset with boom microphone shall be provided for the Dive Supervisor.

3.2.8 ROOM O2 MONITOR: The contractor shall install a room O2 monitor. The monitor shall be located in the Dive Locker. An alarm shall sound when the oxygen percentage is greater than 25%. The alarm shall be an audio and visual alarm.

3.2.9 CLEAN ROOM NITROGEN SUPPLY MOVE: The contractor shall provide piping to move the nitrogen supply to the existing clean room. The piping shall be to extend the supply line to the left of the existing connection approximately 17 feet. The contractor shall provide a 10-foot flex hose with the appropriate connections (coordinated through SDVT1 during the development of the design package). The contractor shall provide a blank end for the nitrogen hard piping. The contractor shall also provide any necessary blank ends and caps for the ends of the flex hose to ensure maintenance of cleanliness.

3.2.10 EXISTING SCUBA SINK MOVE: The contractor shall move the existing SCUBA sink located in the Dive Locker to the High Bay. The sink shall be located to the water side of the MK25/MK16/SCUBA Charging Station and sink. The contractor shall cut off the shelf of the sink prior to installation. The contractor shall ensure that no burrs, or other sharp edges remain after the shelf is removed from the sink. The contractor is responsible for installation of water to the sink, from the building water supply, and plumbing the sink drain to the appropriate drain. The sink shall be outfitted with overflow protection that drains into the appropriate drain.

END OF SECTION

PART C4

4.0 N/A

END OF SECTION

7 Apr 2015

C37

PART C5

5 QUALITY ASSURANCE

5.1 GENERAL REQUIREMENTS:

- 5.1.1 All work performed shall be in accordance with and to the standards and specifications cited in each section. Any changes in design or deviation from accepted standards must be documented, submitted to and accepted the Government prior to change or implementation.
- 5.1.2 **DESIGN REVIEW MEETINGS:** Design and fabrication review meetings shall be held by the contractor at the contractor's facility or the installation site, at time intervals no greater than six weeks. Two weeks advance written notice shall be furnished to the Government prior to each meeting.
- 5.1.3 **CONTRACT ADHERENCE:** The contractor shall rigidly adhere to the requirements for qualification, certification, test, examination and inspection required by the various contract documents.
- 5.1.4 **SUBCONTRACTORS:** Subcontractors shall be monitored by the contractor to assure timely and adequate performance and adherence to approved specifications. Copies of all certifications/qualifications required for the subcontractor to perform his work shall be submitted by the contractor to the Government.
- 5.1.5 **SUBMISSION NUMBER:** All submissions and submittals required by this contract shall include one (1) original and three (3) copies of the submission.
- 5.1.6 **DISK COPIES:** Systems manuals shall be prepared using a commercially available word processing program. All drawings shall be prepared on a commercially available computer aided design program. The component database shall be prepared on a commercially available spreadsheet design program. All submissions (Preliminary Design, Final Design, and As-Built) of systems manuals, drawings, and component database shall include CD copies of the system manuals, drawings, and component database formatted for Windows. Final disk submission of systems manuals, drawings, and component database shall be marked "As built". Final disk submissions of drawings shall include all the names of all signers present, and the date of signature. Complete files must be in current NMCI/SOCOM computer program product format such as MS Word 2010, MS Excel 2010, AUTOCAD release 2010. The contractor shall provide a minimum of four (4) copies of all CD's. **IN ADDITION, THE CONTRACTOR SHALL SCAN THE ENTIRE ACCEPTED AS BUILT SUBMITTAL IN PORTABLE DOCUMENT FORMAT (PDF) AND SUBMIT TWO (2) CDS TO NAVFAC EXWC AND FIVE (5) CD TO THE END USER.**
- 5.1.7 **NOTIFICATION OF TESTING:** The contractor shall provide the Government with written notification of all on site testing. This notification shall be received by the Government a minimum of thirty (30) working days prior to the date of the test.

- 5.1.8 CONTRACTOR'S RECORDS AND DOCUMENTS:** The contractor shall submit copies of all records and documents required by this contract and the codes and specifications cited herein. One original and three copies shall be submitted.
- 5.1.9 PIECEMEAL SUBMITTAL:** Piecemeal submittal of any submittals required by this specification is unacceptable, and such submittals will be returned without review.
- 5.1.10 QUALITY ASSURANCE PLAN:** The contractor's Quality Assurance Plan shall be in accordance with International Organization for Standardization (ISO) 9000 and with any further quality requirements specified in the contract. As a minimum content, the program plan shall disclose the contractor's planned approach to fulfilling the requirements of every paragraph of sections 3 through 7 of MIL-Q-9858. A description of the organization that will fulfill the quality program requirements with a definition of the responsibility and authority of each functional element, shall be included. All of the contractor's documented policies or procedures which implement the quality program shall be identified in appropriate places with the plan. A short summary of the objective or purpose of each procedure shall be given. The plan must delineate, by flow chart or similar technique, where inspection, audit and other controls are to be applied to assure conformance with the contract quality requirements and must identify each assembly, process and inspection instructions applicable to the contract hardware and show where it is to be applied. The plan shall describe the method by which the plan will be applied to sub-contractors.
- 5.1.11 SAFETY PLAN (ACCIDENT PREVENTION PLAN):** The contractor's Safety Plan shall be in accordance with EM-385-1-1, and with any further safety requirements specified in the contract. This includes the Accident Prevention Plan and Activity Hazard Analysis. The contractor shall also meet all of the safety requirements of the base. The base safety requirements are available to the contractor upon request.
- 5.1.12 DESIGN PACKAGE:** Documents in this package shall be of sufficient detail to demonstrate that the contractor's plan for the work described in this contract is in conformance with this contract as well as demonstrating the technical and functional feasibility of the contractor's plan. All elements of the design shall be in strict conformance with the hyperbaric facility code requirements as stated in paragraph 1.2.8. It shall clearly indicate where equipment, components and piping runs are intended to be located. Pragmatic issues of installation and maintenance shall be addressed. During development of the preliminary design, the contractor is responsible for visiting the site to facilitate layout of work. Drawings shall be in accordance with ASME Y14.100. Drawings shall be 17" x 22", Level 2 drawings. The Government will respond to the Preliminary Design submittal within 30 days of receipt. The preliminary package shall consist of the following applicable items, as a minimum.

- a. General Arrangement Drawings.
- b. System piping and electrical schematics.
- c. Calculations.
- d. Proposed Material and Manufacturing Specifications and qualifications.
- e. Preliminary Component Manufacturer's Design Data.
- f. Subcontractors Identification, Qualifications, and Certifications.
- g. Hyperbaric Systems Manual Outline.
- h. Component and Panel ID tags.
- i. Test Plans
- j. Welding Qualifications and Procedures
- k. Cleaning Qualifications and Procedures
- l. Painting Plan
- m. Non-destructive Testing Plan and Qualifications

5.1.13 DRAWING PACKAGE: The drawing package shall be configured, and contain the elements, as described below:

a. Title Page: The title page shall contain the contractors name and address, the contract name, location and number, the NAVFAC EXWC name and address, and any other pertinent information identified.

b. Drawing Tree: The drawing tree shall start with a "Top Drawing", with subsequent drawings developing from subsystems to elements to components, etc. Elements of a subsystem shall be numbered as sub drawings of the subsystem, etc. (see d. below)

c. General Arrangement Schematic: A single, overall schematic drawing of the entire system shall be provided. This drawing shall be organized to provide easy understanding of the capabilities and configuration of the entire system. Any certification boundaries shall be shown. The overall schematic shall show which building or room in which each component is located. Each component shall be clearly shown and the component tag number shall be included next to the component. The AutoCAD copy of this drawing shall have all embedded data attached to each valve and component as described in paragraph 5.1.18, entitled "VALVE & COMPONENT DATABASE".

d. Drawing Numbers: Each drawing (each drawing sheet) shall be given an independent and unique drawing number. Drawings shall be sequential in number. Where there are multiple layers of one drawing for fabrication details (panels, etc.), these drawings can have numbers with the unique drawing number followed by -1, -2, -3, etc. (i.e. 23456-1, 23456-2, etc.). A single drawing number for the entire drawing package is not acceptable.

e. Flow arrows and set pressures (i.e., regulators, flowmeters, etc.) shall be provided on all schematic drawings.

f. The contractor shall not use any special or third party fonts.

g. The contractor shall not use descriptive text on a drawing that has an attributed drawing element already assigned to manage that information.

h. The contractor shall not use single or double quotation marks on drawing.

i. The contractor is to ensure that all entities are to be created on the model tab (model space), full size (1:1). All standard drawing blocks will be placed in model space on the "0" (zero) layer. All dimensions are to be associative and placed on the DIM layer, Font and Text Height, Dimension Extension Lines and Offsets, Arrowheads and Line-weights are preset.

j. The contractor shall identify all certification boundaries on all applicable As-Built schematics. These boundaries shall be identified by dashed lines.

5.1.14 RECORD DRAWINGS AND DOCUMENTATION: All drawings and documentation shall be consistent with the work as it was actually accomplished.

5.1.14.1 DRAWINGS: All drawings (including calculations) submitted to the Contracting Officer shall bear a complete title block with a permanent drawing number, a registered professional engineer's original seal, and dated signature. Drawings shall measure 17 inches by 22 inches minimum, or as designated herein or as acceptable to the COR, and shall have title blocks as specified in paragraph 5.1.13 of this specification. Each category of drawings (such as structural, mechanical, etc.) shall be assigned a specific block of drawing numbers (such as 200, 300, etc.). To facilitate the use of continuous drawing numbers, multiple sheet numbers may be used with the Chamber drawing number designated as "SHEET XX of XX". Drawings within each category shall be numbered consecutively. Each assembly and subassembly drawing shall include an integral Bill of Materials or shall be followed by a consecutively numbered drawing with the applicable Bill of Materials. There shall be no proprietary notes on any drawing. All drawings shall be CAD generated. A proposed drawing list, including drawing titles, shall be provided within 30 days after contract award and shall include submittal dates for major portions of the design. All submissions must demonstrate compliance with the specification requirements, and must be 100% complete (included in section 5.1.13.d). Calculations and catalog cuts must precede or accompany all arrangement drawings, if applicable. During the first five working days after receipt of drawing submittals, COR will do a cursory review for major non-compliance. In the event that major non-compliance is found, COR will stop their review and return the submission package. The non-complying submission will not be considered as having met the submission date. Reviewable drawings will be returned to the contractor

within 45 calendar days after receipt for first submissions and within 15 calendar days of receipt for re-submittals. All required re-submittals by the contractor shall be mailed within 15 calendar days after receipt. For any resubmitted drawing which contains a major redesign, the Government will mail to the contractor its comments within 45 calendar days after receipt.

5.1.14.2 AS-BUILT DRAWINGS: The purpose of the "as-built" drawing classification is to identify the last approved revision which the Hyperbaric Chamber design/construction has undergone at the time of its acceptance by the Government. The "as-built" classification is the final released version of the design/construction drawings. It shall reflect the actual conditions of the Chamber at the time of its acceptance by the Government. Each drawing shall list the latest revision - in alphabetical order- followed by the "as-built" entry in the revision block. (The "as-built" and the preceding revision, although designated by different letters, will identify the same COR "released" configuration of the Chamber design.)

5.1.14.3 ELECTRONIC FORMAT OF DRAWINGS: The contractor shall provide all contract as-built drawings on CD-ROM. The contractor shall provide two disk copies for AutoCad Release 2010. The format of the drawing files shall be in AutoCAD DWG or DXF format. The as-built drawings shall be submitted to the Government following final Government approval of drawings as indicated in paragraph 1.2.7(c) (1).

5.1.14.4 ELECTRONIC FORMAT OF MANUAL: The contractor shall provide two disk copies of the approved technical documentation for the Chamber on a CD-ROM disk in accordance with PDF format. Indexing and retrieval of data archive information is to be clear and legible in every detail. Contractor's detailed written procedures should include a table of contents for operation instruction, preventive maintenance, spare parts list, drawing list, supply list, drawings, catalog cuts, photographs, and calculations, and shall be saved in a database, image and viewer processing file format. Images shall be scanned into files and retrieved from CD-ROM. Contractor's detailed written procedures shall also be saved in Microsoft Word 2010 file format.

5.1.15 COMPONENT MANUFACTURER'S DESIGN DATA: The contractor shall provide the Component Manufacturer's Design Data (CMDD) for all components provided as part of this contract. The CMDD shall be provided in one completely marked and coordinated package sufficient to assure full compliance with the specification requirements. Submittals for each manufactured product shall include, but not be limited to the following: Manufacturer's descriptive literature and catalog cuts, manufacturer's operation and maintenance manual (**2 Copies**), equipment drawings, diagrams, performance and characteristic curves, catalog model or number, nameplate data, size, layout dimensions, capacity, specification reference, component tag number, and find number from valve and component list/drawings. The CMDD can be considered part of the Hyperbaric System Manual.

5.1.16 SYSTEMS MANUAL: The contractor shall provide Systems Manuals. The contractor is responsible for providing all sections for systems provided under this contract. The manual shall consist of the following:

- a. General Facility Description:
- b. System Certification:
- c. There shall be a section addressing each of the Hyperbaric Systems. The following data shall be provided by the Contractor for each system:
 - 1. System Operational Capabilities, Limitations and Set Points.
 - 2. System Narrative Description.
 - 3. System Piping and Electrical Schematics.
 - 4. System Operating Instructions.
 - 5. System Maintenance Instructions.
 - 6. System Design Computations.
 - 7. System Spare Parts Data.
 - 8. Component List.
 - 9. System Functional Test.

5.1.17 CONTRACTOR'S RECORDS AND DOCUMENTS: Contractor's records and documents shall include all records and documents required by Part C1 and C3. These shall include, but are not limited to:

- a. Test reports
- b. Inspection reports
- c. Test plans
- d. Travelers/route sheets
- e. Mill certs/material reports
- f. Procedures
- g. Qualifications
- h. Records
- i. Working drawings
- j. Radiographs
- k. Shop Drawings

5.1.18 VALVE & COMPONENT DATABASE: The Valve & Component Database provides design, procurement and manufacturer's data about all valves and components. The database requirement shall be met by the use of MS Excel 2010. The database fields (columns) shall be:

- a. Component Identification Tag number.
- b. Design data:
 - 1. Type of Component.
 - 2. Size.
 - 3. Drawing Number used on.
 - 4. Required Psi.
 - 5. Material Body and Seat
 - 6. End Connection Type and Material
- c. Manufacturer's Data:
 - 1. Manufacturer's name
 - 2. Manufacturer's address, telephone number.
 - 3. Model Number.

- d. Maintenance Data:
 - 1. Part number and price of consumables.
 - 2. Frequency of maintenance.
 - 3. Manufacturer's Recommended Spare Parts.

5.1.19 FUNCTIONAL TEST PLAN: The contractor shall submit a functional test plan for the complete test of all hardware provided as part of this specification. The functional test plan shall include valve line up, functional testing procedures, pass/fail criteria and shut down of the system being tested. There shall be initial blocks for all steps of the functional test plan. There shall be final signature blocks for both the contractor's completion and the Government's witnessing of successful functional test. The plan will provide information as to all equipment needed for testing and the calibration information for that equipment. The test plan shall contain, as a minimum, the following data:

- a. Test purpose/objectives.
- b. Identify each assembly to be tested.
- c. Describe test set up at each level of test, including diagrams and sketches to illustrate the test set-up.
- d. Describe or identify all test equipment required. Calibration of test equipment.
- e. Describe all test procedures, including test sequence, test parameters, participants, **and pass/fail criteria.**
- f. Provide sample test data sheets to illustrate test data to be documented and delivered at each level of test.
- g. Establish criteria for acceptance at each level of test and describe the procedures to be followed in the event of malfunction or failure.
- h. Identify critical or unusual tests or test conditions.
- i. Overall test schedule.

5.1.20 SYSTEM FUNCTIONAL TEST: The contractor shall be required to demonstrate by testing that all piping, instrumentation and systems provided by this contract are capable of meeting all the criteria contained in this specification. The functional test shall not be conducted until all other required testing has been completed, gas analysis reports have been received, and final, as built drawings have been submitted to the Government. The contractor shall prepare a test plan and a test report. Certification Testing will occur at the same time as the Final Functional Test.

5.1.21 PROJECT SCHEDULE: The contractor shall prepare a contract progress schedule that clearly defines the tasks necessary to accomplish the work. The schedule shall be a GANTT chart, CPM chart or "ROADMAP". The schedule shall be composed of defined and documented Milestones and Tasks (M&T). Milestones are defined as having no time duration; whereas, Tasks have time duration. The schedule shall show the order and interdependence of M&T and the sequence of M&T execution necessary to complete the contract. The schedule shall show the M&T that comprise the critical path. It shall show the float for those M&T not on the critical path. Procurement and subcontracting tasks may cite total individual procurement or subcontract cost. Copies of M&T documents whose work was completed

during a monthly period shall be submitted with the monthly progress report for that period. The M&T documents shall be signed by the contractor to indicate certified completion of the Task. The monthly update of the contract schedule shall contain the date of effect of that update and a list of the revision dates of the schedule. The following shall be included in the schedule as either milestones or tasks, as a minimum, in addition to others necessary to describe the work:

- a. Work Tasks.
- b. Contractual execution date requirements milestones.
- c. Government furnished information and/or equipment milestones.
- d. Contractual submittal date requirements milestones.
- e. Procurement activities including major equipment tasks.
- f. Subcontract activities tasks.
- g. Quality Control checks.

5.1.22 MONTHLY REPORT: The contractor shall provide a monthly report, which shall include an update of the Project Schedule and Component Database. The revised documents shall reflect any changes occurring since the last updating. It shall also include a current Progress Report containing a summary of all work performed and any problems and their solutions encountered during the reporting period, and a statement of the overall status of the project, and a statement of the overall status of the project. This report shall be sent electronically in its entirety to the COR.

5.1.23 PURCHASE ORDERS: The contractor shall submit all purchase orders for all material purchased. The Contractor shall prepare a database or table which cross-references data such as purchase order number, find number (if applicable), and any other pertinent information such as heat numbers. The purchase orders shall be kept in a separate three-ring binder (or binders). Each purchase order (and its applicable data) shall be separated by its own individual tab.

5.1.24 FACILITY FUNCTIONAL TEST: The contractor shall be required to demonstrate by testing that all piping, instrumentation, machinery, and systems installed within, or in conjunction with a facility meet the following criteria:

- a. Are hazard free.
- b. Are in accordance with applicable Codes and Standards.

END OF SECTION

7 Apr 2015

C46

PART C6

6 DRAWINGS AND SCHEMATICS

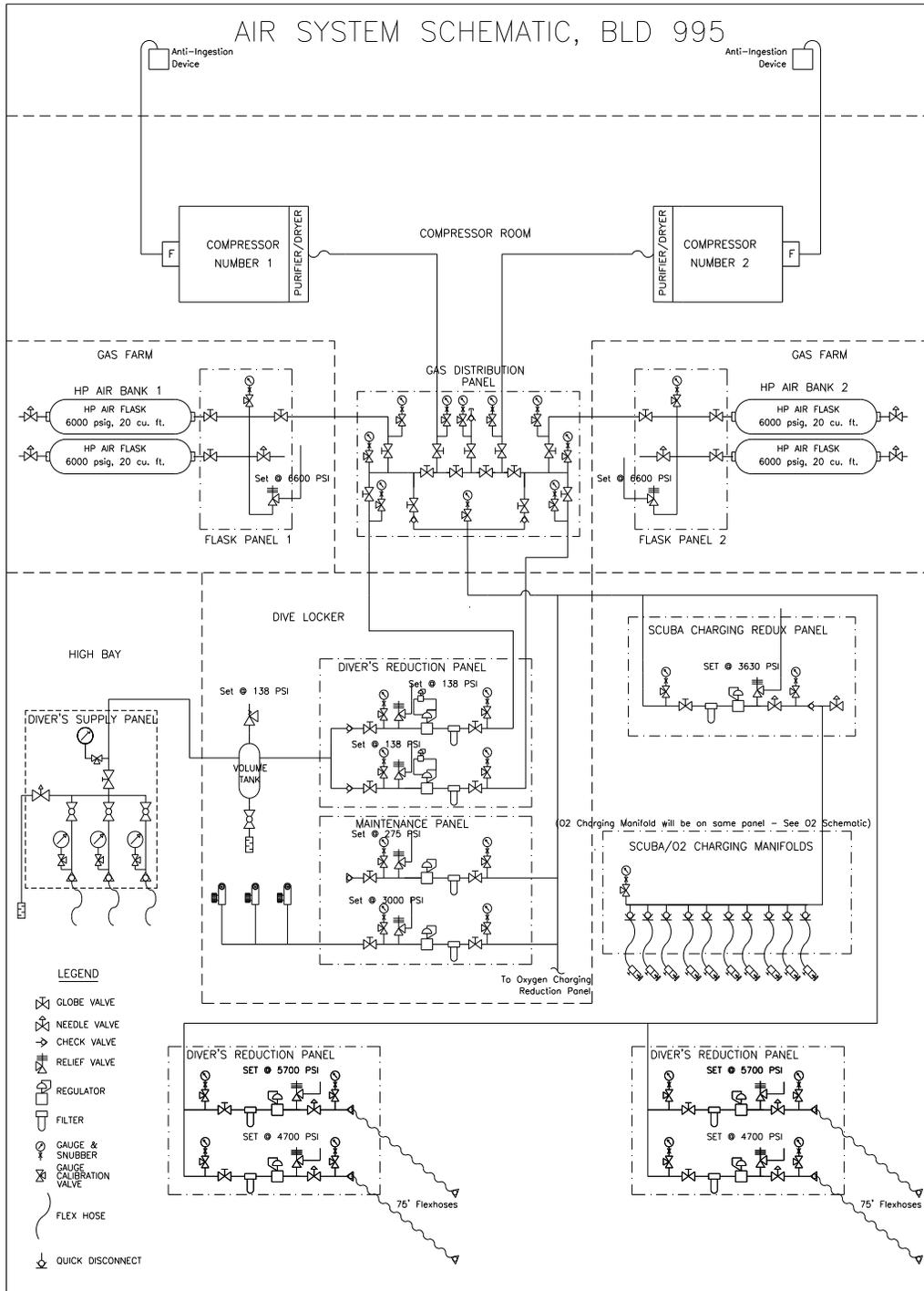


FIGURE 1: Air Schematic

7 Apr 2015

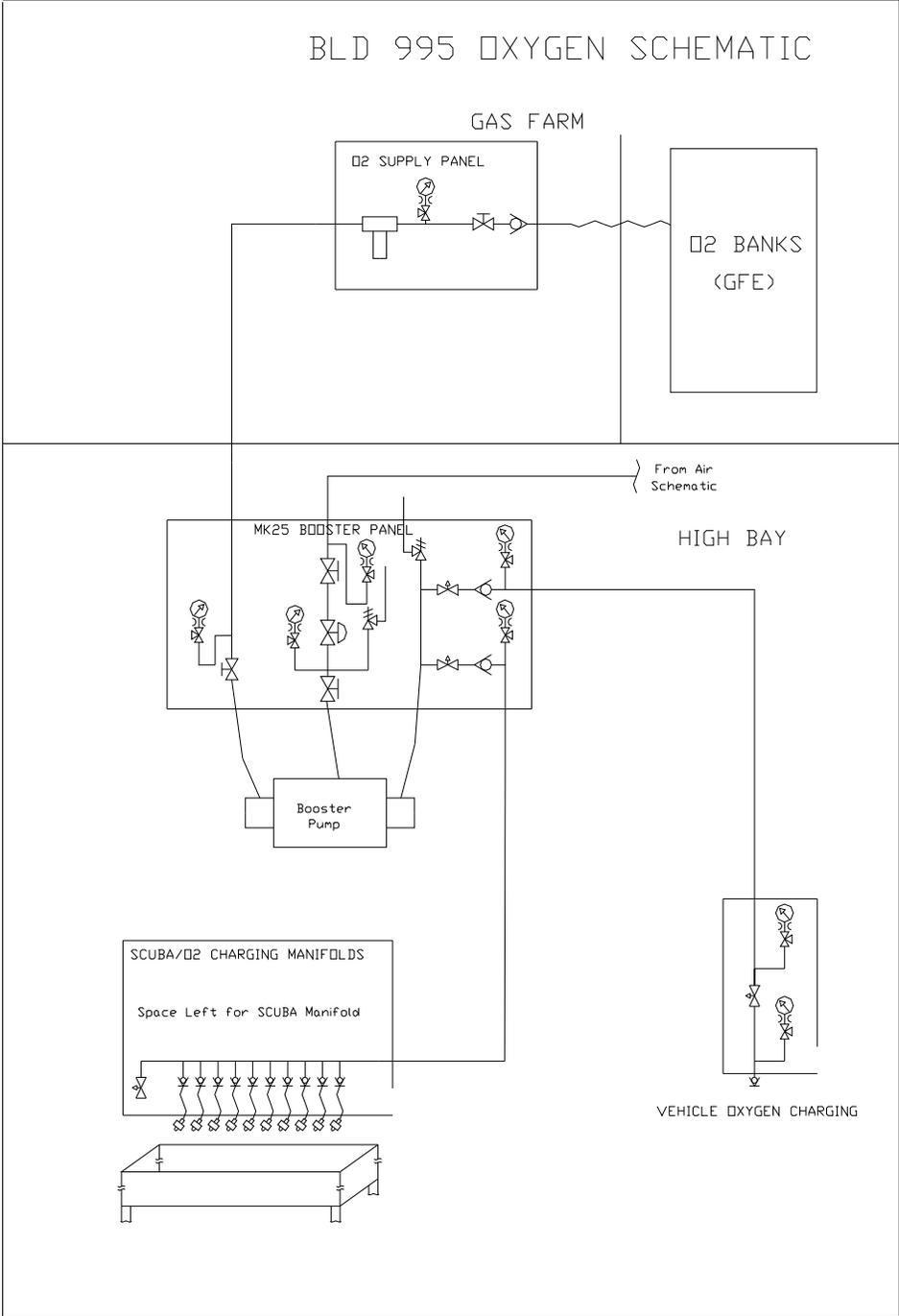
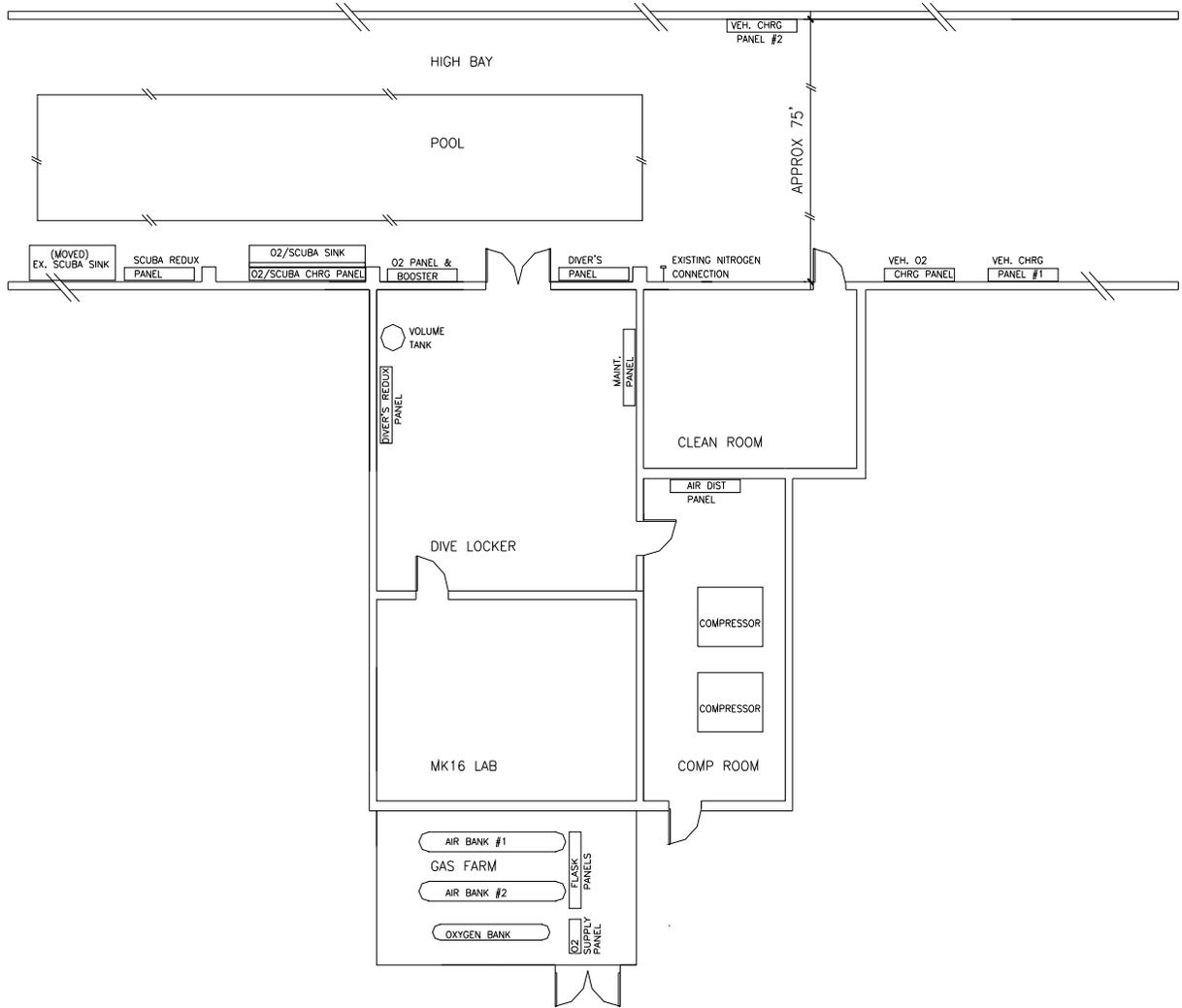


FIGURE 2: Oxygen Schematic



NOT TO SCALE

FIGURE 3: Hyperbaric Equipment Location

END OF SPECIFICATION

7 Apr 2015

General Decision Number: HI160001 02/26/2016 HI1

Superseded General Decision Number: HI20150001

State: Hawaii

Construction Types: Building, Heavy (Heavy and Dredging), Highway and Residential

Counties: Hawaii Statewide.

BUILDING CONSTRUCTION PROJECTS; RESIDENTIAL CONSTRUCTION PROJECTS (consisting of single family homes and apartments up to and including 4 stories); HEAVY AND HIGHWAY CONSTRUCTION PROJECTS AND DREDGING

Note: Under Executive Order (EO) 13658, an hourly minimum wage of \$10.15 for calendar year 2016 applies to all contracts subject to the Davis-Bacon Act for which the solicitation was issued on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least \$10.15 (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2016. The EO minimum wage rate will be adjusted annually. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/08/2016
1	01/15/2016
2	01/22/2016
3	02/05/2016
4	02/26/2016

ASBE0132-001 08/29/2010

	Rates	Fringes
Asbestos Workers/Insulator Includes application of all insulating materials, protective coverings, coatings and finishes to all types of mechanical systems. Also the application of firestopping material for wall openings and penetrations in walls, floors, ceilings and curtain walls.....	\$ 36.65	22.24

BOIL0627-005 01/01/2013

	Rates	Fringes
BOILERMAKER.....	\$ 35.20	27.35

BRHI0001-001 09/03/2012

	Rates	Fringes
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BRICKLAYER

Bricklayers and Stonemasons.....\$ 35.35	22.92
Pointers, Caulkers and Weatherproofers.....\$ 35.60	22.92

BRHI0001-002 09/02/2013

	Rates	Fringes
Tile, Marble & Terrazzo Worker		
Terrazzo Base Grinders.....\$ 35.29		23.22
Terrazzo Floor Grinders and Tenders.....\$ 32.24		23.22
Tile, Marble and Terrazzo Workers.....\$ 37.10		23.22

CARP0745-001 08/31/2015

	Rates	Fringes
Carpenters:		
Carpenters; Hardwood Floor Layers; Patent Scaffold Erectors (14 ft. and over); Piledrivers; Pneumatic Nailers; Wood Shinglers and Transit and/or Layout Man.....\$ 43.90		20.92
Millwrights and Machine Erectors.....\$ 44.15		20.92
Power Saw Operators (2 h.p. and over).....\$ 44.05		20.92

CARP0745-002 08/31/2015

	Rates	Fringes
Drywall and Acoustical Workers and Lathers.....\$ 44.15		20.92

* ELEC1186-001 02/21/2016

	Rates	Fringes
Electricians:		
Cable Splicers.....\$ 48.02		28.74
Electricians.....\$ 43.65		27.41
Telecommunication worker....\$ 26.30		11.58

* ELEC1186-002 02/21/2016

	Rates	Fringes
Line Construction:		
Cable Splicers.....\$ 48.02		28.74
Groundmen/Truck Drivers.....\$ 32.74		24.07
Heavy Equipment Operators...\$ 39.29		26.07
Linemen.....\$ 43.65		27.40
Telecommunication worker....\$ 26.30		11.58

ELEV0126-001 01/01/2015

	Rates	Fringes
ELEVATOR MECHANIC.....\$ 53.07		28.38

a. VACATION: Employer contributes 8% of basic hourly rate for 5 years service and 6% of basic hourly rate for 6 months to 5 years service as vacation pay credit.

b. PAID HOLIDAYS: New Year's Day, Memorial Day, Independence Day, Labor Day, Veterans' Day, Thanksgiving Day, the Friday after Thanksgiving Day and Christmas Day.

ENGI0003-002 08/31/2015

	Rates	Fringes
Diver (Aqua Lung) (Scuba)		
Diver (Aqua Lung) (Scuba)		
(over a depth of 30 feet)...	\$ 62.50	27.98
Diver (Aqua Lung) (Scuba)		
(up to a depth of 30 feet)...	\$ 53.13	27.98
Stand-by Diver (Aqua Lung)		
(Scuba).....	\$ 43.75	27.98
Diver (Other than Aqua Lung)		
Diver (Other than Aqua		
Lung).....	\$ 62.50	27.98
Diver Tender (Other than		
Aqua Lung).....	\$ 40.72	27.98
Stand-by Diver (Other than		
Aqua Lung).....	\$ 43.75	27.98
Helicopter Work		
Airborne Hoist Operator		
for Helicopter.....	\$ 42.30	27.98
Co-Pilot of Helicopter.....	\$ 42.44	27.98
Pilot of Helicopter.....	\$ 42.61	27.98
Power equipment operator -		
tunnel work		
GROUP 1.....	\$ 38.74	27.98
GROUP 2.....	\$ 38.85	27.98
GROUP 3.....	\$ 39.02	27.98
GROUP 4.....	\$ 39.29	27.98
GROUP 5.....	\$ 39.60	27.98
GROUP 6.....	\$ 40.25	27.98
GROUP 7.....	\$ 40.57	27.98
GROUP 8.....	\$ 40.68	27.98
GROUP 9.....	\$ 40.79	27.98
GROUP 9A.....	\$ 41.02	27.98
GROUP 10.....	\$ 41.08	27.98
GROUP 10A.....	\$ 41.23	27.98
GROUP 11.....	\$ 41.38	27.98
GROUP 12.....	\$ 41.74	27.98
GROUP 12A.....	\$ 42.10	27.98
Power equipment operators:		
GROUP 1.....	\$ 38.44	27.98
GROUP 2.....	\$ 38.55	27.98
GROUP 3.....	\$ 38.72	27.98
GROUP 4.....	\$ 38.99	27.98
GROUP 5.....	\$ 39.30	27.98
GROUP 6.....	\$ 39.95	27.98
GROUP 7.....	\$ 40.27	27.98
GROUP 8.....	\$ 40.38	27.98
GROUP 9.....	\$ 40.49	27.98
GROUP 9A.....	\$ 40.72	27.98
GROUP 10.....	\$ 40.78	27.98
GROUP 10A.....	\$ 40.93	27.98
GROUP 11.....	\$ 41.08	27.98
GROUP 12.....	\$ 41.44	27.98
GROUP 12A.....	\$ 41.80	27.98

GROUP 13.....	\$ 38.72	27.98
GROUP 13A.....	\$ 38.99	27.98
GROUP 13B.....	\$ 39.30	27.98
GROUP 13C.....	\$ 39.95	27.98
GROUP 13D.....	\$ 40.27	27.98
GROUP 13E.....	\$ 40.38	27.98

POWER EQUIPMENT OPERATORS CLASSIFICATIONS

GROUP 1: Fork Lift (up to and including 10 tons); Partsman (heavy duty repair shop parts room when needed).

GROUP 2: Conveyor Operator (Handling building material); Hydraulic Monitor; Mixer Box Operator (Concrete Plant).

GROUP 3: Brakeman; Deckhand; Fireman; Oiler; Oiler/Gradechecker; Signalman; Switchman; Highline Cableway Signalman; Bargeman; Bunkerman; Concrete Curing Machine (self-propelled, automatically applied unit on streets, highways, airports and canals); Leveeman; Roller (5 tons and under); Tugger Hoist.

GROUP 4: Boom Truck or dual purpose "A" Frame Truck (5 tons or less); Concrete Placing Boom (Building Construction); Dinky Operator; Elevator Operator; Hoist and/or Winch (one drum); Straddle Truck (Ross Carrier, Hyster and similar).

GROUP 5: Asphalt Plant Fireman; Compressors, Pumps, Generators and Welding Machines ("Bank" of 9 or more, individually or collectively); Concrete Pumps or Pumpcrete Guns; Lubrication and Service Engineer (Grease Rack); Screedman.

GROUP 6: Boom Truck or Dual Purpose "A"Frame Truck (over 5 tons); Combination Loader/Backhoe (up to and including 3/4 cu. yd.); Concrete Batch Plants (wet or dry); Concrete Cutter, Groover and/or Grinder (self-propelled unit on streets, highways, airports, and canals); Conveyor or Concrete Pump (Truck or Equipment Mounted); Drilling Machinery (not to apply to waterliners, wagon drills or jack hammers); Fork Lift (over 10 tons); Loader (up to and including 3 and 1/2 cu. yds); Lull High Lift (under 40 feet); Lubrication and Service Engineer (Mobile); Maginnis Internal Full Slab Vibrator (on airports, highways, canals and warehouses); Man or Material Hoist; Mechanical Concrete Finisher (Large Clary, Johnson Bidwell, Bridge Deck and similar); Mobile Truck Crane Driver; Portable Shotblast Concrete Cleaning Machine; Portable Boring Machine (under streets, highways, etc.); Portable Crusher; Power Jumbo Operator (setting slip forms, etc., in tunnels); Rollers (over 5 tons); Self-propelled Compactor (single engine); Self-propelled Pavement Breaker; Skidsteer Loader with attachments; Slip Form Pumps (Power driven by hydraulic, electric, air, gas, etc., lifting device for concrete forms); Small Rubber Tired Tractors; Trencher (up to and including 6 feet); Underbridge Personnel Aerial Platform (50 feet of platform or less).

GROUP 7: Crusher Plant Engineer, Dozer (D-4, Case 450, John Deere 450, and similar); Dual Drum Mixer, Extend Lift; Hoist and/or Winch (2 drums); Loader (over 3 and 1/2 cu. yds. up to and including 6 yards.); Mechanical Finisher or Spreader Machine (asphalt), (Barber Greene and similar) (Screedman required); Mine or Shaft Hoist; Mobile Concrete Mixer (over 5 tons); Pipe Bending Machine (pipelines only); Pipe Cleaning Machine (tractor propelled and supported);

Pipe Wrapping Machine (tractor propelled and supported); Roller Operator (Asphalt); Self-Propelled Elevating Grade Plane; Slusher Operator; Tractor (with boom) (D-6, or similar); Trencher (over 6 feet and less than 200 h.p.); Water Tanker (pulled by Euclids, T-Pulls, DW-10, 20 or 21, or similar); Winchman (Stern Winch on Dredge).

GROUP 8: Asphalt Plant Operator; Barge Mate (Seagoing); Cast-in-Place Pipe Laying Machine; Concrete Batch Plant (multiple units); Conveyor Operator (tunnel); Deckmate; Dozer (D-6 and similar); Finishing Machine Operator (airports and highways); Gradesetter; Kolman Loader (and similar); Mucking Machine (Crawler-type); Mucking Machine (Conveyor-type); No-Joint Pipe Laying Machine; Portable Crushing and Screening Plant; Power Blade Operator (under 12); Saurman Type Dragline (up to and including 5 yds.); Stationary Pipe Wrapping, Cleaning and Bending Machine; Surface Heater and Planer Operator, Tractor (D-6 and similar); Tri-Batch Paver; Tunnel Badger; Tunnel Mole and/or Boring Machine Operator Underbridge Personnel Aerial Platform (over 50 feet of platform).

GROUP 9: Combination Mixer and Compressor (gunitite); Do-Mor Loader and Adams Elegrader; Dozer (D-7 or equal); Wheel and/or Ladder Trencher (over 6 feet and 200 to 749 h.p.).

GROUP 9A: Dozer (D-8 and similar); Gradesetter (when required by the Contractor to work from drawings, plans or specifications without the direct supervision of a foreman or superintendent); Push Cat; Scrapers (up to and including 20 cu. yds); Self-propelled Compactor with Dozer; Self-Propelled, Rubber-Tired Earthmoving Equipment (up to and including 20 cu. yds) (621 Band and similar); Sheep's Foot; Tractor (D-8 and similar); Tractors with boom (larger than D-6, and similar).

GROUP 10: Chicago Boom; Cold Planers; Heavy Duty Repairman or Welder; Hoist and/or Winch (3 drums); Hydraulic Skooper (Koehring and similar); Loader (over 6 cu. yds. up to and including 12 cu. yds.); Saurman type Dragline (over 5 cu. yds.); Self-propelled, rubber-tired Earthmoving Equipment (over 20 cu. yds. up to and including 31 cu. yds.) (637D and similar); Soil Stabilizer (P & H or equal); Sub-Grader (Gurries or other automatic type); Tractors (D-9 or equivalent, all attachments); Tractor (Tandem Scraper); Watch Engineer.

GROUP 10A: Boat Operator; Cable-operated Crawler Crane (up to and including 25 tons); Cable-operated Power Shovel, Clamshell, Dragline and Backhoe (up to and including 1 cu. yd.); Dozer D9-L; Dozer (D-10, HD41 and similar) (all attachments); Gradall (up to and including 1 cu. yd.); Hydraulic Backhoe (over 3/4 cu. yds. up to and including 2 cu. yds.); Mobile Truck Crane Operator (up to and including 25 tons) (Mobile Truck Crane Driver Required); Self-propelled Boom Type Lifting Device (Center Mount) (up to and including 25 tons) (Grove, Drott, P&H, Pettibone and similar); Trencher (over 6 feet and 750 h.p. or more); Watch Engineer (steam or electric).

GROUP 11: Automatic Slip Form Paver (concrete or asphalt); Band Wagon (in conjunction with Wheel Excavator); Cable-operated Crawler Cranes (over 25 tons but less than 50 tons); Cable-operated Power Shovel, Clamshell, Dragline and Backhoe (over 1 cu. yd. up to 7 cu. yds.); Gradall (over 1 cu. yds. up to 7 cu. yds.); DW-10, 20, etc.

(Tandem); Earthmoving Machines (multiple propulsion power units and 2 or more Scrapers) (up to and including 35 cu. yds., "struck" m.r.c.); Highline Cableway; Hydraulic Backhoe (over 2 cu. yds. up to and including 4 cu. yds.); Leverman; Lift Slab Machine; Loader (over 12 cu. yds.); Master Boat Operator; Mobile Truck Crane Operator (over 25 tons but less than 50 tons); (Mobile Truck Crane Driver required); Pre-stress Wire Wrapping Machine; Self-propelled Boom-type Lifting Device (Center Mount) (over 25 tons m.r.c); Self-propelled Compactor (with multiple-propulsion power units); Single Engine Rubber Tired Earthmoving Machine (with Tandem Scraper); Tandem Cats; Trencher (pulling attached shield).

GROUP 12: Clamshell or Dipper Operator; Derricks; Drill Rigs; Multi-Propulsion Earthmoving Machines (2 or more Scrapers) (over 35 cu. yds "struck"m.r.c.); Operators (Derricks, Piledrivers and Cranes); Power Shovels and Draglines (7 cu. yds. m.r.c. and over); Self-propelled rubber-tired Earthmoving equipment (over 31 cu. yds.) (657B and similar); Wheel Excavator (up to and including 750 cu. yds. per hour); Wheel Excavator (over 750 cu. yds. per hour).

GROUP 12A: Dozer (D-11 or similar or larger); Hydraulic Excavators (over 4 cu. yds.); Lifting cranes (50 tons and over); Pioneering Dozer/Backhoe (initial clearing and excavation for the purpose of providing access for other equipment where the terrain worked involves 1-to-1 slopes that are 50 feet in height or depth, the scope of this work does not include normal clearing and grubbing on usual hilly terrain nor the excavation work once the access is provided); Power Blade Operator (Cat 12 or equivalent or over); Straddle Lifts (over 50 tons); Tower Crane, Mobile; Traveling Truss Cranes; Universal, Liebherr, Linden, and similar types of Tower Cranes (in the erection, dismantling, and moving of equipment there shall be an additional Operating Engineer or Heavy Duty Repairman); Yo-Yo Cat or Dozer.

GROUP 13: Truck Driver (Utility, Flatbed, etc.)

GROUP 13A: Dump Truck, 8 cu.yds. and under (water level); Water Truck (up to and including 2,000 gallons).

GROUP 13B: Water Truck (over 2,000 gallons); Tandem Dump Truck, over 8 cu. yds. (water level).

GROUP 13C: Truck Driver (Semi-trailer. Rock Cans, Semi-Dump or Roll-Offs).

GROUP 13D: Truck Driver (Slip-In or Pup).

GROUP 13E: End Dumps, Unlicensed (Euclid, Mack, Caterpillar or similar); Tractor Trailer (Hauling Equipment); Tandem Trucks hooked up to Trailer (Hauling Equipment)

BOOMS AND/OR LEADS (HOURLY PREMIUMS):

The Operator of a crane (under 50 tons) with a boom of 80 feet or more (including jib), or of a crane (under 50 tons) with leads of 100 feet or more, shall receive a per hour premium for each hour worked on said crane (under 50 tons) in accordance with the following schedule:

Booms of 80 feet up to but

not including 130 feet or Leads of 100 feet up to but not including 130 feet	0.50
Booms and/or Leads of 130 feet up to but not including 180 feet	0.75
Booms and/or Leads of 180 feet up to and including 250 feet	1.15
Booms and/or Leads over 250 feet	1.50

The Operator of a crane (50 tons and over) with a boom of 180 feet or more (including jib) shall receive a per hour premium for each hour worked on said crane (50 tons and over) in accordance with the following schedule:

Booms of 180 feet up to and including 250 feet	1.25
Booms over 250 feet	1.75

ENGI0003-004 09/01/2015

	Rates	Fringes
Dredging: (Boat Operators)		
Boat Deckhand.....	\$ 38.72	27.98
Boat Operator.....	\$ 40.93	27.98
Master Boat Operator.....	\$ 41.08	27.98
Dredging: (Clamshell or Dipper Dredging)		
GROUP 1.....	\$ 41.44	27.98
GROUP 2.....	\$ 40.78	27.98
GROUP 3.....	\$ 40.38	27.98
GROUP 4.....	\$ 38.72	27.98
Dredging: (Derricks)		
GROUP 1.....	\$ 41.44	27.98
GROUP 2.....	\$ 40.78	27.98
GROUP 3.....	\$ 40.38	27.98
GROUP 4.....	\$ 38.72	27.98
Dredging: (Hydraulic Suction Dredges)		
GROUP 1.....	\$ 41.08	27.98
GROUP 2.....	\$ 40.93	27.98
GROUP 3.....	\$ 40.78	27.98
GROUP 4.....	\$ 40.72	27.98
GROUP 5.....	\$ 37.88	26.76
Group 5.....	\$ 40.38	27.98
GROUP 6.....	\$ 37.77	26.76
Group 6.....	\$ 40.27	27.98
GROUP 7.....	\$ 36.22	26.76
Group 7.....	\$ 38.72	27.98

CLAMSHELL OR DIPPER DREDGING CLASSIFICATIONS

- GROUP 1: Clamshell or Dipper Operator.
- GROUP 2: Mechanic or Welder; Watch Engineer.
- GROUP 3: Barge Mate; Deckmate.
- GROUP 4: Bargeman; Deckhand; Fireman; Oiler.

HYDRAULIC SUCTION DREDGING CLASSIFICATIONS

- GROUP 1: Leverman.
- GROUP 2: Watch Engineer (steam or electric).
- GROUP 3: Mechanic or Welder.
- GROUP 4: Dozer Operator.
- GROUP 5: Deckmate.
- GROUP 6: Winchman (Stern Winch on Dredge)

GROUP 7: Deckhand (can operate anchor scow under direction of Deckmate); Fireman; Leveeman; Oiler.

DERRICK CLASSIFICATIONS

GROUP 1: Operators (Derricks, Piledrivers and Cranes).

GROUP 2: Saurman Type Dragline (over 5 cubic yards).

GROUP 3: Deckmate; Saurman Type Dragline (up to and including 5 yards).

GROUP 4: Deckhand, Fireman, Oiler.

ENGI0003-044 08/31/2015

	Rates	Fringes
Power Equipment Operators (PAVING)		
(10) Cold Planer.....	\$ 40.25	27.87
(10) Loader (2 1/2 cu. yds. and under).....	\$ 39.42	27.87
(10) Soil Stabilizer.....	\$ 40.25	27.87
(11) Loader (over 2 1/2 cu. yds. to and including 5 cu. yds.).....	\$ 39.74	27.87
(3) Roller Operator (five tons and under).....	\$ 38.19	27.87
(5) Screed Person.....	\$ 39.42	27.87
(6) Combination Loader/Backhoe (up to 3/4 cu.yd.).....	\$ 37.48	27.87
(6) Concrete Saws and/or Grinder (self-propelled unit on streets, highways, airports and canals).....	\$ 39.42	27.87
(6) Roller Operator (over five tons).....	\$ 39.62	27.87
(7) Combination Loader/Backhoe (over 3/4 cu.yd.).....	\$ 38.46	27.87
(8) Asphalt Plant Operator..	\$ 39.89	27.87
Asphalt Concrete Material Transfer.....	\$ 39.42	27.87
Asphalt Raker.....	\$ 38.46	27.87
Asphalt Spreader Operator...	\$ 39.94	27.87
Grader.....	\$ 40.25	27.87
Laborer, Hand Roller.....	\$ 37.96	27.87

IRON0625-001 09/01/2014

	Rates	Fringes
Ironworkers:.....	\$ 35.75	29.01
a. Employees will be paid \$.50 per hour more while working in tunnels and coffer dams; \$1.00 per hour more when required to work under or are covered with water (submerged) and when they are required to work on the summit of Mauna Kea, Mauna Loa or Haleakala.		

LABO0368-001 08/31/2015

	Rates	Fringes
Laborers:		
Driller.....	\$ 35.35	17.51
Final Clean Up.....	\$ 25.75	13.34

Gunite/Shotcrete Operator and High Scaler.....	\$ 34.85	17.51
Laborer I.....	\$ 34.35	17.51
Laborer II.....	\$ 31.75	17.51
Mason Tender/Hod Carrier....	\$ 34.85	17.51
Powderman.....	\$ 35.35	17.51
Window Washer (bosun chair)...	\$ 33.85	17.51

LABORERS CLASSIFICATIONS

Laborer I: Air Blasting run by electric or pneumatic compressor; Asphalt Laborer, Ironer, Raker, Luteman, and Handroller, and all types of Asphalt Spreader Boxes; Asphalt Shoveler; Assembly and Installation of Multiplates, Liner Plates, Rings, Mesh, Mats; Batching Plant (portable and temporary); Boring Machine Operator (under streets and sidewalks); Buggymobile; Burning and Welding; Chainsaw, Faller, Logloader, and Bucker; Compactors (Jackson Jumping Jack and similar); Concrete Bucket Dumpman; Concrete Chipping; Concrete Chuteman/Hoseman (pouring concrete) (the handling of the chute from ready-mix trucks for such jobs as walls, slabs, decks, floors, foundations, footings, curbs, gutters, and sidewalks); Concrete Core Cutter (Walls, Floors, and Ceiling); Concrete Grinding or Sanding; Concrete: Hooking on, signaling, dumping of concrete for treme work over water on caissons, pilings, abutments, etc.; Concrete: Mixing, handling, conveying, pouring, vibrating, otherwise placing of concrete or aggregates or by any other process; Concrete: Operation of motorized wheelbarrows or buggies or machines of similar character, whether run by gas, diesel, or electric power; Concrete Placement Machine Operator: operation of Somero Hammerhead, Copperheads, or similar machines; Concrete Pump Machine (laying, coupling, uncoupling of all connections and cleaning of equipment); Concrete and/or Asphalt Saw (Walking or Handtype) (cutting walls or flatwork) (scoring old or new concrete and/or asphalt) (cutting for expansion joints) (streets and ways for laying of pipe, cable or conduit for all purposes); Concrete Shovelers/Laborers (Wet or Dry); Concrete Screeding for Rough Strike-Off: Rodding or striking-off, by hand or mechanical means prior to finishing; Concrete Vibrator Operator; Coring Holes: Walls, footings, piers or other obstructions for passage of pipes or conduits for any purpose and the pouring of concrete to secure the hole; Cribbers, Shorer, Lagging, Sheeting, and Trench Jacking and Bracing, Hand-Guided Lagging Hammer Whaling Bracing; Curbing (Concrete and Asphalt); Curing of Concrete (impervious membrane and form oiler) mortar and other materials by any mode or method; Cut Granite Curb Setter (setting, leveling and grouting of all precast concrete or stone curbs); Cutting and Burning Torch (demolition); Dri Pak-It Machine; Environmental Abatement: removal of asbestos, lead, and bio hazardous materials (EPA and/or OSHA certified); Falling, bucking, yarding, loading or burning of all trees or timber on construction site; Forklift (9 ft. and under); Gas, Pneumatic, and Electric tools; Grating and Grill work for drains or other purposes; Green Cutter of concrete or aggregate in any form, by hand, mechanical means, grindstone or air and/or water; Grout: Spreading for any purpose; Guinea Chaser (Grade Checker) for general utility trenches, sitework, and excavation; Headerboard Man (Asphalt or Concrete); Heat Welder of Plastic (Laborers' AGC certified workers) (when work involves waterproofing for waterponds, artificial lakes and reservoir) heat welding for sewer pipes and fusion of HDPE pipes; Heavy Highway Laborer (Rigging, signaling, handling,

and installation of pre-cast catch basins, manholes, curbs and gutters); High Pressure Nozzleman - Hydraulic Monitor (over 100# pressure); Jackhammer Operator; Jacking of slip forms: All semi and unskilled work connected therewithin; Laying of all multi-cell conduit or multi-purpose pipe; Magnesite and Mastic Workers (Wet or Dry) (including mixer operator); Mortar Man; Mortar Mixer (Block, Brick, Masonry, and Plastering); Nozzleman (Sandblasting and/or Water Blasting): handling, placing and operation of nozzle; Operation, Manual or Hydraulic jacking of shields and the use of such other mechanical equipment as may be necessary; Pavement Breakers; Paving, curbing and surfacing of streets, ways, courts, under and overpasses, bridges, approaches, slope walls, and all other labor connected therewith; Pilecutters; Pipe Accessment in place, bolting and lining up of sectional metal or other pipe including corrugated pipe; Pipelayer performing all services in the laying and installation of pipe from the point of receiving pipe in the ditch until completion of operation, including any and all forms of tubular material, whether pipe, HDPE, metallic or non-metallic, conduit, and any other stationary-type of tubular device used for conveying of any substance or element, whether water, sewage, solid, gas, air, or other product whatsoever and without regard to the nature of material from which tubular material is fabricated; No-joint pipe and stripping of same, Pipewrapper, Caulker, Bander, Kettleman, and men applying asphalt, Laykold, treating Creosote and similar-type materials (6-inch) pipe and over); Piping: resurfacing and paving of all ditches in preparation for laying of all pipes; Pipe laying of lateral sewer pipe from main or side sewer to buildings or structure (except Contactor may direct work be done under proper supervision); Pipe laying, leveling and marking of the joint used for main or side sewers and storm sewers; Laying of all clay, terra cotta, ironstone, vitrified concrete, HDPE or other pipe for drainage; Placing and setting of water mains, gas mains and all pipe including removal of skids; Plaster Mortar Mixer/Pump; Pneumatic Impact Wrench; Portable Sawmill Operation: Choker setters, off bearers, and lumber handlers connected with clearing; Posthole Digger (Hand Held, Gas, Air and Electric); Powderman's Tender; Power Broom Sweepers (Small); Preparation and Compaction of roadbeds for railroad track laying, highway construction, and the preparation of trenches, footings, etc., for cross-country transmission by pipelines, electrical transmission or underground lines or cables (by mechanical means); Raising of structure by manual or hydraulic jacks or other methods and resetting of structure in new locations, including all concrete work; Ramming or compaction; Rigging in connection with Laborers' work (except demolition), Signaling (including the use of walkie talkie) Choke Setting, tag line usage; Tagging and Signaling of building materials into high rise units; Riprap, Stonepaver, and Rock Slinger (includes placement of stacked concrete, wet or dry and loading, unloading, signaling, slinging and setting of other similar materials); Rotary Scarifier (including multiple head concrete chipping Scarifier); Salamander Heater, Drying of plaster, concrete mortar or other aggregate; Scaffold Erector Leadman; Scaffolds: (Swing and hanging) including maintenance thereof; Scaler; Septic Tank/Cesspool and Drain Fields Digger and Installer; Shredder/Chipper (tree branches, brush, etc.); Stripping and Setting Forms; Stripping of Forms: Other than panel forms which are to be re-used in their original form, and stripping of forms on all flat arch work; Tampers (Barko,

Wacker, and similar type); Tank Scaler and Cleaners; Tarman; Tree Climbers and Trimmers; Trencher (includes hand-held, Davis T-66 and similar type); Trucks (flatbed up to and including 2 1/2 tons when used in connection with on-site Laborers' work; Trucks (Refuse and Garbage Disposal) (from job site to dump); Vibra-Screed (Bull Float in connection with Laborers' work); Well Points, Installation of or any other dewatering system.

Laborer II: Asphalt Plant Laborer; Boring Machine Tender; Bridge Laborer; Burning of all debris (crates, boxes, packaging waste materials); Chainman, Rodmen, and Grade Markers; Cleaning, clearing, grading and/or removal for streets, highways, roadways, aprons, runways, sidewalks, parking areas, airports, approaches, and other similar installations; Cleaning or reconditioning of streets, ways, sewers and waterlines, all maintenance work and work of an unskilled and semi-skilled nature; Concrete Bucket Tender (Groundman) hooking and unhooking of bucket; Concrete Forms; moving, cleaning, oiling and carrying to the next point of erection of all forms; Concrete Products Plant Laborers; Conveyor Tender (conveying of building materials); Crushed Stone Yards and Gravel and Sand Pit Laborers and all other similar plants; Demolition, Wrecking and Salvage Laborers: Wrecking and dismantling of buildings and all structures, with use of cutting or wrecking tools, breaking away, cleaning and removal of all fixtures, All hooking, unhooking, signaling of materials for salvage or scrap removed by crane or derrick; Digging under streets, roadways, aprons or other paved surfaces; Driller's Tender; Chuck Tender, Outside Nipper; Dry-packing of concrete (plugging and filling of she-bolt holes); Fence and/or Guardrail Erector: Dismantling and/or re-installation of all fence; Finegrader; Firewatcher; Flagman (Coning, preparing, stablishing and removing portable roadway barricade devices); Signal Men on all construction work defined herein, including Traffic Control Signal Men at construction site; General Excavation; Backfilling, Grading and all other labor connected therewith; Digging of trenches, ditches and manholes and the leveling, grading and other preparation prior to laying pipe or conduit for any purpose; Excavations and foundations for buildings, piers, foundations and holes, and all other construction. Preparation of street ways and bridges; General Laborer: Cleaning and Clearing of all debris and surplus material. Clean-up of right-of-way. Clearing and slashing of brush or trees by hand or mechanical cutting. General Clean up: sweeping, cleaning, wash-down, wiping of construction facility and equipment (other than "Light Clean up (Janitorial) Laborer. Garbage and Debris Handlers and Cleaners. Appliance Handling (job site) (after delivery unloading in storage area); Ground and Soil Treatment Work (Pest Control); Gunitite/Shotcrete Operator Tender; Junk Yard Laborers (same as Salvage Yard); Laser Beam "Target Man" in connection with Laborers' work; Layout Person for Plastic (when work involves waterproofing for waterponds, artificial lakes and reservoirs); Limbers, Brush Loaders, and Pilers; Loading, Unloading, carrying, distributing and handling of all rods and material for use in reinforcing concrete construction (except when a derrick or outrigger operated by other than hand power is used); Loading, unloading, sorting, stockpiling, handling and distribution of water mains, gas mains and all pipes; Loading and unloading of all materials, fixtures, furnishings and appliances from point of delivery to stockpile to point of installation; hooking and signaling from truck, conveyance

or stockpile; Material Yard Laborers; Pipelayer Tender; Pipewrapper, Caulker, Bander, Kettlemen, and men applying asphalt, Laykold, Creosote, and similar-type materials (pipe under 6 inches); Plasterer Laborer; Preparation, construction and maintenance of roadbeds and sub-grade for all paving, including excavation, dumping, and spreading of sub-grade material; Prestressed or precast concrete slabs, walls, or sections: all loading, unloading, stockpiling, hooking on of such slabs, walls or sections; Quarry Laborers; Railroad, Streetcar, and Rail Transit Maintenance and Repair; Roustabout; Rubbish Trucks in connection with Building Construction Projects (excluding clearing, grubbing, and excavating); Salvage Yard: All work connected with cutting, cleaning, storing, stockpiling or handling of materials, all cleanup, removal of debris, burning, back-filling and landscaping of the site; Sandblasting Tender (Pot Tender): Hoses and pots or markers; Scaffolds: Erection, planking and removal of all scaffolds used for support for lathers, plasters, brick layers, masons, and other construction trades crafts; Scaffolds: (Specially designed by carpenters) laborers shall tend said carpenter on erection and dismantling thereof, preparation for foundation or mudsills, maintenance; Scraping of floors; Screeds: Handling of all screeds to be reused; handling, dismantling and conveyance of screeds; Setting, leveling and securing or bracing of metal or other road forms and expansion joints; Sheeting Piling/trench shoring (handling and placing of skip sheet or wood plank trench shoring); Ship Scalers; Shipwright Tender; Sign Erector (subdivision traffic, regulatory, and street-name signs); Sloper; Slurry Seal Crews (Mixer Operator, Applicator, Squeegee Man, Shuttle Man, Top Man); Snapping of wall ties and removal of tie rods; Soil Test operations of semi and unskilled labor such as filling sand bags; Stripper (Asphalt, Concrete or other Paved Surfaces); Tool Room Attendant (Job Site); Traffic Delineating Device Applicator; Underpinning, lagging, bracing, propping and shoring, loading, signaling, right-of-way clearance along the route of movement, The clearance of new site, excavation of foundation when moving a house or structure from old site to new site; Utilities employees; Water Man; Waterscape/Hardscape Laborers; Wire Mesh Pulling (all concrete pouring operations); Wrecking, stripping, dismantling and handling concrete forms an false work.

 LABO0368-002 09/01/2015

	Rates	Fringes
Landscape & Irrigation Laborers		
GROUP 1.....	\$ 23.70	10.67
GROUP 2.....	\$ 24.30	10.67
GROUP 3.....	\$ 19.95	10.67

LABORERS CLASSIFICATIONS

GROUP 1: Installation of non-potable permanent or temporary irrigation water systems performed for the purposes of Landscaping and Irrigation architectural horticultural work; the installation of drinking fountains and permanent or temporary irrigation systems using potable water for Landscaping and Irrigation architectural horticultural purposes only. This work includes (a) the installation of all heads, risers, valves, valve boxes, vacuum breakers

(pressure and non-pressure), low voltage electrical lines and, provided such work involves electrical wiring that will carry 24 volts or less, the installation of sensors, master control panels, display boards, junction boxes, conductors, including all other components for controllers, (b) and metallic (copper, brass, galvanized, or similar) pipe, as well as PVC or other plastic pipe including all work incidental thereto, i.e., unloading, handling and distribution of all pipes fittings, tools, materials and equipment, (c) all soldering work in connection with the above whether done by torch, soldering iron, or other means; (d) tie-in to main lines, thrust blocks (both precast and poured in place), pipe hangers and supports incidental to installation of the entire irrigation system, (e) making of pressure tests, start-up testing, flushing, purging, water balancing, placing into operation all irrigation equipment, fixtures and appurtenances installed under this agreement, and (f) the fabrication, replacement, repair and servicing of landscaping and irrigation systems. Operation of hand-held gas, air, electric, or self-powered tools and equipment used in the performance of Landscape and Irrigation work in connection with architectural horticulture; Choke-setting, signaling, and rigging for equipment operators on job-site in the performance of such Landscaping and Irrigation work; Concrete work (wet or dry) performed in connection with such Landscaping and Irrigation work. This work shall also include the setting of rock, stone, or riprap in connection with such Landscape, Waterscape, Rockscape, and Irrigation work; Grubbing, pick and shovel excavation, and hand rolling or tamping in connection with the performance of such Landscaping and Irrigation work; Sprigging, handseeding, and planting of trees, shrubs, ground covers, and other plantings and the performance of all types of gardening and horticultural work relating to said planting; Operation of flat bed trucks (up to and including 2 1/2 tons):.

GROUP 2. Layout of irrigation and other non-potable irrigation water systems and the layout of drinking fountains and other potable irrigation water systems in connection with such Landscaping and Irrigation work. This includes the layout of all heads, risers, valves, valve boxes, vacuum breakers, low voltage electrical lines, hydraulic and electrical controllers, and metallic (coppers, brass, galvanized, or similar) pipe, as well as PVC or other plastic pipe. This work also includes the reading and interpretation of plans and specifications in connection with the layout of Landscaping, Rockscape, Waterscape, and Irrigation work; Operation of Hydro-Mulching machines (sprayman and driver), Drillers, Trenchers (riding type, Davis T-66, and similar) and fork lifts used in connection with the performance of such Landscaping and Irrigation work; Tree climbers and chain saw tree trimmers, Sporadic operation (when used in connection with Landscaping, Rockscape, Waterscape, and Irrigation work) of Skid-Steer Loaders (Bobcat and similar), Cranes (Bantam, Grove, and similar), Hoptos, Backhoes, Loaders, Rollers, and Dozers (Case, John Deere, and similar), Water Trucks, Trucks requiring a State of Hawaii Public Utilities Commission Type 5 and/or type 7 license, sit-down type and "gang" mowers, and other self-propelled, sit-down operated machines not listed under Landscape & Irrigation Maintenance Laborer; Chemical spraying using self-propelled power spraying equipment (200 gallon capacity or more).

GROUP 3: Maintenance of trees, shrubs, ground covers, lawns and other planted areas, including the replanting of trees, shrubs, ground covers, and other plantings that did not "take" or which are damaged; provided, however, that re-planting that requires the use of equipment, machinery, or power tools shall be paid for at the rate of pay specified under Landscape and Irrigation Laborer, Group 1; Raking, mowing, trimming, and runing, including the use of "weed eaters", hedge trimmers, vacuums, blowers, and other hand-held gas, air, electric, or self-powered tools, and the operation of lawn mowers (Note: The operation of sit-down type and "gang" mowers shall be paid for at the rate of pay specified under Landscape & Irrigation Laborer, Group 2); Guywiring, staking, propping, and supporting trees; Fertilizing, Chemical spraying using spray equipment with less than 200 gallon capacity, Maintaining irrigation and sprinkler systems, including the staking, clamping, and adjustment of risers, and the adjustment and/or replacement of sprinkler heads, (Note: the cleaning and gluing of pipe and fittings shall be paid for at the rate of pay specified under Landscape & Irrigation Laborer(Group 1); Watering by hand or sprinkler system and the performance of other types of gardening, yardman, and horticultural-related work.

LABO0368-003 08/31/2015

	Rates	Fringes
Underground Laborer		
GROUP 1.....	\$ 34.95	17.51
GROUP 2.....	\$ 36.45	17.51
GROUP 3.....	\$ 36.95	17.51
GROUP 4.....	\$ 37.95	17.51
GROUP 5.....	\$ 38.30	17.51
GROUP 6.....	\$ 38.55	17.51
GROUP 7.....	\$ 39.00	17.51

GROUP 1: Watchmen; Change House Attendant.

GROUP 2: Swamper; Brakeman; Bull Gang-Muckers, Trackmen; Dumpmen (any method); Concrete Crew (includes rodding and spreading); Grout Crew; Reboundmen

GROUP 3: Chucktenders and Cabetenders; Powderman (Prime House); Vibratorman, Pavement Breakers

GROUP 4: Miners - Tunnel (including top and bottom man on shaft and raise work); Timberman, Retimberman (wood or steel or substitute materials thereof); Blasters, Drillers, Powderman (in heading); Microtunnel Laborer; Headman; Cherry Pickerman (where car is lifted); Nipper; Grout Gunmen; Grout Pumpman & Potman; Gunite, Shotcrete Gunmen & Potmen; Concrete Finisher (in tunnel); Concrete Screed Man; Bit Grinder; Steel Form Raisers & Setters; High Pressure Nozzleman; Nozzleman (on slick line); Sandblaster-Potman (combination work assignment interchangeable); Tugger

GROUP 5: Shaft Work & Raise (below actual or excavated ground level); Diamond Driller; Gunite or Shotcrete Nozzleman; Rodman; Groundman

GROUP 6: Shifter

GROUP 7: Shifter (Shaft Work & Raiser)

PAIN1791-001 01/01/2016

	Rates	Fringes
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Painters:

Brush.....	\$ 34.85	27.57
Sandblaster; Spray.....	\$ 34.85	27.57

PAIN1889-001 07/01/2015

	Rates	Fringes
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Glaziers.....	\$ 34.78	27.37
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PAIN1926-001 03/01/2015

	Rates	Fringes
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Soft Floor Layers.....	\$ 31.15	25.75
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PAIN1944-001 01/01/2016

	Rates	Fringes
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Taper.....	\$ 41.50	21.55
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PLAS0630-001 08/31/2015

	Rates	Fringes
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PLASTERER.....	\$ 37.90	25.33
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PLAS0630-002 08/31/2015

	Rates	Fringes
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Cement Masons:

Cement Masons.....	\$ 37.90	25.33
Trowel Machine Operators....	\$ 38.05	25.33

PLUM0675-001 01/03/2016

	Rates	Fringes
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Plumber, Pipefitter, Steamfitter & Sprinkler Fitter...	\$ 40.35	24.73
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ROOF0221-001 09/06/2015

	Rates	Fringes
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Roofers (Including Built Up, Composition and Single Ply).....	\$ 38.85	17.53
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SHEE0293-001 08/01/2015

	Rates	Fringes
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Sheet metal worker.....	\$ 42.96	20.58
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SUHI1997-002 09/15/1997

	Rates	Fringes
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Drapery Installer.....	\$ 13.60	1.20
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FENCE ERECTOR (Chain Link Fence).....	\$ 9.33	1.65
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WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than "SU" or "UAVG" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material,

etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION

QUALITY ASSURANCE SURVEILLANCE PLAN (QASP)

FOR

**Hyperbaric System at
Building 995
Seal Delivery Team 1
Pearl City, HI**

Issued: March 23, 2015

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QUALITY ASSURANCE SURVEILLANCE PLAN (QASP)

1 INTRODUCTION

This quality assurance surveillance plan (QASP) is pursuant to the requirements listed in the Statement of Work (SOW) entitled, “Hyperbaric System at Building 995, Seal Delivery Team 1, Pearl City, HI”. This plan sets forth the procedures and guidelines that Naval Facilities Engineering and Expeditionary Warfare Center (NAVFAC EXWC) will use in ensuring the required task orders are achieved by the contractor.

1.1 Purpose

1.1.1 The purpose of the QASP is to describe the systematic methods used to monitor performance and to identify the required documentation and the resources to be employed. The QASP provides a means for evaluating whether the contractor is meeting the performance standards/quality levels identified in the SOW and the contractor’s quality control plan (QCP), and to ensure that the government pays only for the level of services received.

1.1.2 This QASP defines the roles and responsibilities of all members of the integrated project team (IPT), identifies the performance objectives, defines the methodologies used to monitor and evaluate the contractor’s performance, describes quality assurance documentation requirements, and describes the analysis of quality assurance monitoring results.

1.2 Performance Management Approach

1.2.1 The SOW structures the acquisition around “what” service or quality level is required, as opposed to “how” the contractor should perform the work (i.e., results, not compliance). This QASP will define the performance management approach taken by NAVFAC EXWC to monitor and manage the contractor’s performance to ensure the expected outcomes or performance objectives communicated in the SOW are achieved. Performance management rests on developing a capability to review and analyze information generated through performance assessment. The ability to make decisions based on the analysis of performance data is the cornerstone of performance management; this analysis yields information that indicates whether expected outcomes for the project are being achieved by the contractor.

1.2.2 Performance management represents a significant shift from the more traditional quality assurance (QA) concepts in several ways. Performance management focuses on assessing whether outcomes are being achieved and to what extent. This approach migrates away from scrutiny of compliance with the processes and practices used to achieve the outcome. A performance-based approach enables the contractor to play a large role in how the work is performed, as long as the proposed processes are within the stated constraints. The only exceptions to process reviews are those required by law (federal, state, and local) and compelling business situations, such as safety and health. A “results” focus provides the contractor flexibility to continuously improve and innovate over the course of the contract as long as the critical outcomes expected are being achieved and/or the desired performance levels are being met.

1.3 Performance Management Strategy

1.3.1 The contractor is responsible for the quality of all work performed. The contractor measures that quality through the contractor’s own quality control (QC) program. QC is work output, not workers, and therefore includes all work performed under this contract regardless of whether the work is performed by contractor employees or by subcontractors. The contractor’s QC program will set forth the staffing and

procedures for self-inspecting the quality, timeliness, responsiveness, customer satisfaction, and other performance requirements in the SOW. The contractor will develop and implement a performance management system with processes to assess and report its performance to the designated government representative. The contractor's QCP will be submitted with the Preliminary Design Submittal in accordance with paragraph 5.1.10 of the performance work statement. This QASP enables the government to take advantage of the contractor's QC program.

1.3.2 The government representative(s) will monitor performance and review performance reports furnished by the contractor to determine how the contractor is performing against communicated performance objectives. The government will make determination regarding incentives based on performance measurement metric data and notify the contractor of those decisions. The contractor will be responsible for making required changes in processes and practices to ensure performance is managed effectively.

2 ROLES AND RESPONSIBILITIES

2.1 The Contracting Officer

The contracting officer (KO) is responsible for monitoring contract compliance, contract administration, cost control, and for resolving any differences between the observations documented by the Contracting Officer's Representative (COR) and the contractor. The KO will designate one full-time COR as the government authority for performance management. The number of additional representatives serving as technical inspectors depends on the complexity of the services measured, as well as the contractor's performance, and must be identified and designated by the KO.

2.2 The Contracting Officer's Representative

The COR is designated in writing by the KO to act as his or her authorized representative to assist in administering a contract. COR limitations are contained in the written appointment letter. The COR is responsible for technical administration of the project and ensures proper government surveillance of the contractor's performance. The COR is not empowered to make any contractual commitments or to authorize any contractual changes on the government's behalf. Any changes that the contractor deems may affect contract price, terms, or conditions shall be referred to the KO for action. The COR will have the responsibility for completing QA monitoring forms used to document the inspection and evaluation of the contractor's work performance. Government surveillance may occur under the inspection of services clause for any service relating to the contract.

3 IDENTIFICATION OF REQUIRED PERFORMANCE STANDARDS/QUALITY LEVELS

The required performance standards and/or quality levels are included in the SOW and in Attachment 1, "Performance Requirements Summary." The Contractor Performance Assessment Reporting System (CPARS) rates contractor's using five categories; "Exceptional", "Very Good", "Satisfactory", "Marginal", and "Unsatisfactory." If the contractor exceeds the service or performance level, they will receive an "Exceptional" Rating. If the contractor meets the required service or performance level, they will be rated with a "Very Good", "Satisfactory" or "Marginal" rating, depending on the quality of the service and their performance level. If the contractor fails to meet the required service or performance level will result in a rating of "Unsatisfactory." Please note that there are other reasons where a lower or higher rating may be warranted. These reasons will be listed in the evaluation which will be provided to the contractor upon contract completion.

4 METHODOLOGIES TO MONITOR PERFORMANCE

4.1 Surveillance Techniques

In an effort to minimize the performance management burden, simplified surveillance methods shall be used by the government to evaluate contractor performance when appropriate. The primary methods of surveillance are (include those that apply)

- Each month, the COR, shall review the generated documentation and enter summary results into the associated eProject record or by utilizing the Surveillance Activity Checklist, Attachment 2 and uploading into eProjects.
- Periodic monitoring – The COR or Navy Technical Representative (NTR) typically performs the periodic monitoring on an interval.
- Random monitoring – Will be performed by the COR, NTR or other designated personnel.

4.2 Customer Feedback

The contractor is expected to establish and maintain professional communication between its employees and customers. The primary objective of this communication is customer satisfaction. Customer satisfaction is the most significant external indicator of the success and effectiveness of all services provided and can be measured through customer complaints.

Performance management drives the contractor to be customer focused through initially and internally addressing customer complaints and investigating the issues and/or problems but the customer always has the option to communicate complaints to the COR, as opposed to the contractor.

Customer complaints, to be considered valid, must set forth clearly and in writing the detailed nature of the complaint, must be signed, and must be forwarded to the COR. The COR will accept those customer complaints and investigate using the Quality Assurance Monitoring Form, identified in Attachment 2 and checking the Customer Complaint box.

Customer feedback may also be obtained either from the results of formal customer satisfaction surveys or from random customer complaints.

4.3 Acceptable Quality Levels

The acceptable quality levels (AQLs) included in Attachment 1, Performance Requirements Summary Table, for contractor performance is structured to allow the contractor to manage how the work is performed. For certain critical activities such as those involving; materials data, welding, NDT, cleaning, and As-Built Submittal report, the desired performance level is established at 100 percent.

5 QUALITY ASSURANCE DOCUMENTATION

5.1 The Performance Management Feedback Loop

The performance management feedback loop begins with the communication of expected outcomes. Performance standards are expressed in the SOW and are assessed using the performance monitoring techniques shown in Attachment 1.

5.2 Monitoring Forms

The government's QA surveillance, accomplished by the COR, will be reported using the monitoring forms in Attachment 2. The form, when completed, will document the government's assessment of the contractor's performance under the contract to ensure that the required results are being achieved.

5.2.1 The COR will retain a copy of all completed QA surveillance forms.

6 ANALYSIS OF QUALITY ASSURANCE ASSESSMENT

6.1 Determining Performance

6.1.1 Government shall use the monitoring methods cited to determine whether the performance standards/service levels/AQLs have been met. Attention of prospective bidders is called to the fact that this contract calls for the fabrication of life sensitive support systems. Failure to adhere to the highest standards of metallurgy, welding, oxygen cleanliness and workmanship will create severe hazards to persons working on or near these systems when they are pressurized. If the contractor has not met the minimum requirements, they may be asked to develop a corrective action plan to show how and by what date it intends to bring performance up to the required levels.

6.2 Reporting

6.2.1 Once a month, the COR will update the associated eProject record summarizing the overall results of the quality assurance surveillance of the contractor's performance. This update will include the contractor's submitted monthly progress report and a summary of task order surveillance or the completed quality assurance monitoring form (Attachment 2). This will become part of the QA documentation. It will enable the government to demonstrate whether the contractor is meeting the stated objectives and/or performance standards, including cost/technical/scheduling objectives.

6.3 Reviews and Resolution

6.3.1 The COR may require the contractor's project manager, or a designated alternate, to meet with the KO and other government IPT personnel as deemed necessary to discuss performance evaluation. The KO will define a frequency of in-depth reviews with the contractor, including appropriate self-assessments by the contractor; however, if the need arises, the contractor will meet with the COR as often as required or per the contractor's request. The agenda of the reviews should include but are not limited to:

- Performance assessment data
- Issues and concerns of both parties
- Projected outlook for progress against schedule, including a corrective action plan analysis
- Recommendations for improved efficiency and/or effectiveness

6.3.2 The Quality Action Report (QAR) must coordinate and communicate with the contractor to resolve issues and concerns regarding marginal or unacceptable performance.

6.3.3 The COR and contractor should jointly formulate immediate and long-term courses of action. Decisions regarding changes to metrics, thresholds, or service levels should be clearly documented. Changes to service levels, procedures, and metrics will be incorporated as a contract modification at the convenience of the KO.

ATTACHMENT 1: PERFORMANCE REQUIREMENTS SUMMARY

Required Services (Tasks)	Performance Standards	Acceptable Quality Levels	Methods of Surveillance	Incentive (Positive and Negative)
Material data	Contractor is in compliance with SOW 100% of the time	100%	Plan review conducted by COR. On-site inspection conducted by COR	CPARS Review
Welding	Contractor is in compliance with SOW 100% of the time	100%	Plan review conducted by COR. On-site inspection conducted by COR	CPARS Review
NDT	Contractor is in compliance with SOW 100% of the time	100%	Plan review conducted by COR. On-site inspection conducted by COR	CPARS Review
Cleaning	Contractor is in compliance with SOW 100% of the time	100%	Plan review conducted by COR. On-site inspection conducted by COR	CPARS Review
Create or Update AutoCAD Drawings	Hyperbaric facilities CAD drawings instructions	100%	Final Report Submittal	CPARS Review
As-Built Submittal	Recommended remediation actions agree with draft and final reports	99% of submittal requirements	Draft and Final Report Review	CPARS Review

