

<b>SOLICITATION, OFFER AND AWARD</b> <b>(Construction, Alteration, or Repair)</b>	1. SOLICITATION NO.	2. TYPE OF SOLICITATION	3. DATE ISSUED	PAGE OF PAGES
	VA256-13-B-0002	<input checked="" type="checkbox"/> SEALED BID (IFB) <input type="checkbox"/> NEGOTIATED (RFP)	12-11-2012	1 of 119

**IMPORTANT - The "offer" section on the reverse must be fully completed by offeror.**

4. CONTRACT NO.	5. REQUISITION/PURCHASE REQUEST NO.	6. PROJECT NO.
CODE		623-13-103

7. ISSUED BY	623/90c	8. ADDRESS OFFER TO
Department of Veterans Affairs Jack C. Montgomery VA Medical Center ATTN: P&C, 90c 1011 Honor Heights Drive Muskogee OK 74401-1318		See below for mailing address and hand carried bid address.  Clearly label the outside of all bid envelopes with: VA256-13-B-0002.

9. FOR INFORMATION CALL:	A. NAME	B. TELEPHONE NO. (Include area code) (NO COLLECT CALLS)
	David L. Brown	918-680-3235

#### SOLICITATION

**NOTE: In sealed bid solicitations "offer" and "offeror" mean "bid" and "bidder".**

10. THE GOVERNMENT REQUIRES PERFORMANCE OF THE WORK DESCRIBED IN THESE DOCUMENTS (Title, identifying no., date):

This project consists of general construction, electrical and HVAC to correct existing deficiencies for project 623-13-101 Commission Surgery HVAC systems in accordance with the attached specifications and Statement of Work.

Location of work and address to Mail sealed Bids (Block 8 above) is:

Jack C. Montgomery VA Medical Center  
 1011 Honor Heights Drive (90c)  
 Muskogee, OK 74401

Hand carried Bids must be delivered, prior to bid opening, to:

Jack C. Montgomery VA Medical Center (Administrative/Contracting Office Building)  
 2410 East Shawnee ByPass Suite G  
 Muskogee, OK 74403

A public bid opening will be held at 1:00pm (CST) on January 10, 2013 at:

Jack C. Montgomery VA Medical Center (Administrative/Contracting Office Building)  
 2410 East Shawnee ByPass, Suite G  
 Muskogee, OK 74403

Bid opening attendance is limited to 1 representative per bidding company (including subs) due to limited space.

Cost Range: \$25,000.00 to \$100,000.00

20% Bid, 100% Payment and 100% Performance bonds are required.

This is a 100% set aside for Service Disabled Veteran Owned Small Business (SDVOSB) who are so designated on vetbiz.gov.

A site visit is scheduled for 9:00am on December 20, 2012 at Bldg 18 on the grounds of the Jack C. Montgomery Medical Center.

All contractor questions must be submitted in writing to David L. Brown not later than January 3, 2013.

11. The Contractor shall begin performance within 10 calendar days and complete it within 150 calendar days after receiving ☐ award, ☒ notice to proceed. This performance period is ☒ mandatory, ☐ negotiable. (See 52.211-10.)

12A. THE CONTRACTOR MUST FURNISH ANY REQUIRED PERFORMANCE AND PAYMENT BONDS? (If "YES," indicate within how many calendar days after award in Item 12B.)

☒ YES ☐ NO

12B. CALENDAR DAYS

10

13. ADDITIONAL SOLICITATION REQUIREMENTS:

- A. Sealed offers in original and 1 copies to perform the work required are due at the place specified in Item 8 by 1:00pm (hour) local time 01-10-2013 (date). If this is a sealed bid solicitation, offers must be publicly opened at that time. Sealed envelopes containing offers shall be marked to show the offeror's name and address, the solicitation number, the date and time offers are due
- B. An offer guarantee ☒ is, ☐ is not required.
- C. All offers are subject to the (1) work requirements, and (2) other provisions and clauses incorporated in the solicitation in full text or by reference
- D. Offers providing less than 60 calendar days for Government acceptance after the date offers are due will not be considered and will be rejected.

## OFFER(Must be fully completed by offeror)

14. NAME AND ADDRESS OF OFFEROR (Include ZIP Code)		15. TELEPHONE NO. (Include area code)
		16. REMITTANCE ADDRESS (Include only if different than Item 14)
CODE	FACILITY CODE	

17. The offeror agrees to perform the work required at the prices specified below in strict accordance with the terms of the solicitation, if this offer is accepted by the Government in writing within \_\_\_\_\_ calendar days after the date offers are due. (Insert any number equal to or greater than the minimum requirement stated in Item 13D. Failure to insert any number means the offeror accepts the minimum in Item 13D.)

AMOUNTS

18. The offeror agrees to furnish any required performance and payment bonds.

## 19. ACKNOWLEDGMENT OF AMENDMENTS

(The offeror acknowledges receipt of amendments to the solicitation - give number and date of each)

AMENDMENT NO.										
DATE										

20A. NAME AND TITLE OF PERSON AUTHORIZED TO SIGN OFFER (Type or print)	20B. SIGNATURE	20C. OFFER DATE
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## AWARD (To be completed by Government)

21. ITEMS ACCEPTED:

22. AMOUNT	23. ACCOUNTING AND APPROPRIATION DATA  623-3630162-5224-854200-3220 23NRNR804	
24. SUBMIT INVOICES TO ADDRESS SHOWN IN (4 copies unless otherwise specified)	ITEM	25. OTHER THAN FULL AND OPEN COMPETITION PURSUANT TO <input type="checkbox"/> 10 U.S.C. 2304(c)( ) <input type="checkbox"/> 41 U.S.C. 253(c)( ) <input type="checkbox"/>
26. ADMINISTERED BY Department of Veterans Affairs Jack C. Montgomery VA Medical Center ATTN: P&C, 90c 1011 Honor Heights Drive Muskogee OK 74401-1318	CODE 623/90c	27. PAYMENT WILL BE MADE BY 623/04 Department of Veterans Affairs Financial Services Center PO Box 149971 Austin TX 78714-9971 PHONE: FAX:

## CONTRACTING OFFICER WILL COMPLETE ITEM 28 OR 29 AS APPLICABLE

<input type="checkbox"/> 28. NEGOTIATED AGREEMENT (Contractor is required to sign this document and return _____ copies to issuing office.) Contractor agrees to furnish and deliver all items or perform all work, requisitions identified on this form and any continuation sheets for the consideration stated in this contract. The rights and obligations of the parties to this contract shall be governed by (a) this contract award, (b) the solicitation, and (c) the clauses, representations, certifications, and specifications incorporated by reference in or attached to this contract.		<input type="checkbox"/> 29. AWARD (Contractor is not required to sign this document.) Your offer on this solicitation, is hereby accepted as to the items listed. This award consummates the contract, which consists of (a) the Government solicitation and your offer, and (b) this contract award. No further contractual document is necessary.	
30A. NAME AND TITLE OF CONTRACTOR OR PERSON AUTHORIZED TO SIGN (Type or print)		31A. NAME OF CONTRACTING OFFICER (Type or print) David L. Brown V1609L2-0773	
30B. SIGNATURE	30C. DATE	31B. UNITED STATES OF AMERICA	BY

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## A.1 Statement of Work

11/27/2012

This notice is for Project No. 623-12-103, Commission Surgery HVAC Systems at the Jack C. Montgomery VA Medical Center, Muskogee, Oklahoma. This is a 100% Service Disabled Veteran Owned Small Business Set-Aside (SDVOSB). All SDVOSB's may submit a bid, which will be considered by the agency. If your firm is not legally designated as a Service Disabled Veteran Owned Small Business, you are not eligible to bid on this project. This procurement is classified under NAICS Code 238220 and has a size standard of \$14.0 Million. The cost estimate range for this project is between \$25,000.00 and \$100,000.00. Contractor shall provide all labor, materials, equipment, supervision, and transportation required to:

1. Provide all labor and materials to correct the following existing deficiencies:
  - a. Contractor shall provide and install wireless temperature/humidity sensor in the sterile field of each Operating Room (OR-1 thru OR-5). New sensors shall be the primary input for ORs. Existing wall sensors shall remain as secondary input if primary input fails. Sensors and programming sequences shall be commissioned.
  - b. Contractor shall provide and install high limit differential pressure switch (0.7" wc) on all air control valves (20 Places) and input to alarm at digital controls enterprise server. This alarm shall be commissioned as well as the existing low differential pressure switch alarm.
1. Provide all needed support from VA controls contractor (Automated Building Systems – Tulsa) and Test & Balance contractor to complete commissioning. Verify all digital control system calibrations, control sequences, and PID loop tunings. Test and Balance of all systems in drawings shall be re-performed to verify the report as directed by the Commissioning Agent. New report shall also include room pressure relationships in all modes of operation. Sound and vibration readings should not need to be repeated unless there are concerns from the Commissioning Agent.
1. Review mechanical surgical suite HVAC as-built construction drawings (qty. 19) and controls as-built construction drawings (qty. 7) against field installed components and existing programmed sequences. Revise the draft functional performance test to as-built conditions and review with VA to ensure commissioning is comprehensive.
1. Review mechanical standby chiller as-built construction drawings (qty. 10) and controls as-built construction drawings (qty. 3) against field installed components and existing programmed sequences. Operational sequence commissioning will be limited to emergency generator operation mode only. Amend the draft functional performance test to as-built conditions and review with VA to ensure standby chiller commissioning is comprehensive.

1. Execute commissioning tests and witness and document all results. Controls contractor shall provide all operating sequences, I&C drawings, and programming block diagrams as pdf attachment to existing graphics for HVAC system as well as AutoCad 2011 drawings.

Intent of the project is to commission the surgical suite HVAC and supporting systems in regard to mechanical components and digital control systems. Electrical systems will generally not be commissioned except for variable speed drives and motor starters and electrical controls that directly impact mechanical system operational sequences.

Existing systems have been in operation for over 1 year. Commissioning pre-functional checklist shall include verification by contractor of all items identified by the Commissioning Agent to ensure that systems are ready for testing.

The Commissioning Agent Firm shall be certified by the Association of Energy Engineers as a Certified Building Commissioning Firm (CBCF). The individual designated as the Commissioning Agent, shall be certified by the Association of Energy Engineers as a Certified Building Commissioning Professional (CBCP). Alternatively, the Commissioning Agent Firm and Commissioning Agent shall be certified by ACG as a Certified Commissioning Authority. Commissioning Firm and agent shall have prior experience in commissioning hospital HVAC systems and provide references. Proof of certification(s) shall be submitted to the Contracting Officer and the Resident Engineer prior to award of contract.

Contractor shall commission all surgical suite and standby chiller components to ensure a complete functional system in all modes of operation for the surgical suite (occupied, unoccupied, smoke control, standby chiller cooling, VFD bypass, all safety trips). Stand-by generator will not be commissioned. Standby chiller commissioning shall include monitoring of surgical suite environment during transition to standby chiller at design conditions. Commission to ensure appropriate cooling loads are shed to allow design conditions to be maintained in surgical suite.

Contractor is responsible for all changes to programming sequences, instrumentation and control calibrations, and test and balance adjustments in order to commission the HVAC systems. All re-testing shall be the responsibility of the contractor. Contact the VA for resolution to any components that have failed, are installed improperly, or are missing.

Commissioning shall include de-energizing each individual surgical suite local controller and network controller to ensure HVAC systems default to failsafe operation.

Contractor shall provide laptop PC with Windows 7 operating system. Coordinate with digital controls contractor for minimum requirements to operate VA owned Workplace Tech configuration software.

All testing will typically be performed after hours (typically after 5PM-5AM weekdays) or on weekends.

Contract shall be completed within 20 weeks following Notice to Proceed. Contract extension and remobilization at no additional cost to the government may be required for any testing that requires near design heating or cooling outdoor conditions to be met.

Shall be completed in accordance with specifications, provisions, clauses and conditions of this contract and shall be completed within 150 calendar days from issue of Notice to Proceed. All work shall comply with local and state codes.

## **INFORMATION REGARDING BIDDING MATERIAL, BID GUARANTEE AND BONDS**

(a) Bidding materials consisting of drawings, specifications and contract forms may be obtained by qualified General (Prime) Contractors interested in submitting bids direct to the Department of Veterans Affairs. A maximum of 0 sets may be issued when requested. Up to 0 sets of drawings and specifications will be furnished upon request to subcontractors for their use in preparing subbids for General (Prime) Contractors. Suppliers and subcontractors listed above shall show in their requests the work or equipment for which they intend to prepare subbids.

(b) One set of drawings and specifications may be obtained by Builders Exchanges, Chambers of Commerce, Quantity Surveyors, trade and microfilming organizations.

(c) Bidding materials may be obtained only upon written application to the issuing office. Bidders should allow 5 working days after receipt of their request by the issuing office for reproduction, in addition to mail delivery time when requesting bidding material.

(d) Subcontractors, material firms and others interested in preparing subbids may, upon application to the issuing office, obtain a list of organizations, such as Builders Exchanges, Chambers of Commerce, Contractors and others, who have received bidding materials.

(e) While no deposit will be necessary, return of the bidding material, postage prepaid, to the issuing office within 10 days after date of opening bids will be required. In case no bid is to be submitted, the return of the bidding material, as soon as this fact has been determined and before the date of opening bids, is requested. If you decide not to bid on this project, please advise the issuing office of your reasons (the contracting officer should modify accordingly if a deposit is required).

(f) A bid guarantee is required in an amount not less than 20 percent of the bid price but shall not exceed \$3,000,000. Failure to furnish the required bid guarantee in the proper form and amount, by the time set for opening of bids, will require rejection of the bid in all cases except those listed in FAR 28.101-4, and may be cause for rejection even then.

(g) The bidder to whom award is made will be required to furnish two bonds, a Payment Bond, SF 25A, and a Performance Bond, SF 25, each in the penal sum as noted in the General Conditions of the Specification. Copies of SFs 25 and 25A may be obtained upon application to the issuing office.

Cost Range: \$25,000.00 to \$100,000.00





## INSTRUCTIONS, CONDITIONS AND OTHER STATEMENTS TO BIDDERS/OFFERORS

### 2.1 52.222-5 DAVIS-BACON ACT--SECONDARY SITE OF THE WORK (JUL 2005)

(a)(1) The offeror shall notify the Government if the offeror intends to perform work at any secondary site of the work, as defined in paragraph (a)(1)(ii) of the FAR clause at 52.222-6, Davis-Bacon Act, of this solicitation.

(2) If the offeror is unsure if a planned work site satisfies the criteria for a secondary site of the work, the offeror shall request a determination from the Contracting Officer.

(b)(1) If the wage determination provided by the Government for work at the primary site of the work is not applicable to the secondary site of the work, the offeror shall request a wage determination from the Contracting Officer.

(2) The due date for receipt of offers will not be extended as a result of an offeror's request for a wage determination for a secondary site of the work.

(End of Provision)

### 2.2 52.222-23 NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY FOR CONSTRUCTION (FEB 1999)

(a) The offeror's attention is called to the Equal Opportunity clause and the Affirmative Action Compliance Requirements for Construction clause of this solicitation.

(b) The goals for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area, are as follows:

Goals for minority participation for each trade	Goals for female participation for each trade
%	6.9 %

These goals are applicable to all the Contractor's construction work performed in the covered area. If the Contractor performs construction work in a geographical area located outside of the covered area, the Contractor shall apply the goals established for the geographical area where the work is actually performed. Goals are published periodically in the Federal Register in notice form, and these notices may be obtained from any Office of Federal Contract Compliance Programs office.

(c) The Contractor's compliance with Executive Order 11246, as amended, and the regulations in 41 CFR 60-4 shall be based on (1) its implementation of the Equal Opportunity clause, (2) specific affirmative action obligations required by the clause entitled "Affirmative Action Compliance Requirements for Construction," and (3) its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade. The Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor, or from project to project, for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, Executive

Order 11246, as amended, and the regulations in 41 CFR 60-4. Compliance with the goals will be measured against the total work hours performed.

(d) The Contractor shall provide written notification to the Deputy Assistant Secretary for Federal Contract Compliance, U.S. Department of Labor, within 10 working days following award of any construction subcontract in excess of \$10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the--

- (1) Name, address, and telephone number of the subcontractor;
- (2) Employer's identification number of the subcontractor;
- (3) Estimated dollar amount of the subcontract;
- (4) Estimated starting and completion dates of the subcontract; and
- (5) Geographical area in which the subcontract is to be performed.

(e) As used in this Notice, and in any contract resulting from this solicitation, the "covered area" is

Muskogee County Oklahoma

(End of Provision)

### **2.3 52.225-22 NOTICE OF REQUIRED USE OF AMERICAN IRON, STEEL, AND MANUFACTURED GOODS--BUY AMERICAN ACT--CONSTRUCTION MATERIALS (OCT 2010)**

(a) *Definitions.* "Construction material," "domestic construction material," "foreign construction material," "manufactured construction material," "steel," and "unmanufactured construction material," as used in this provision, are defined in the clause of this solicitation entitled "Required Use of Iron, Steel, and Manufactured Goods-Buy American Act-Construction Materials" (Federal Acquisition Regulation (FAR) clause 52.225-21).

(b) *Requests for determinations of inapplicability.* An offeror requesting a determination regarding the inapplicability of section 1605 of the American Recovery and Reinvestment Act of 2009 (Pub. L. 111-5) (Recovery Act) or the Buy American Act should submit the request to the Contracting Officer in time to allow a determination before submission of offers. The offeror shall include the information and applicable supporting data required by paragraphs (c) and (d) of the clause at FAR 52.225-21 in the request. If an offeror has not requested a determination regarding the inapplicability of 1605 of the Recovery Act or the Buy American Act before submitting its offer, or has not received a response to a previous request, the offeror shall include the information and supporting data in the offer.

(c) Evaluation of offers.

(1) If the Government determines that an exception based on unreasonable cost of domestic construction material applies in accordance with FAR 25.604, the Government will evaluate an offer requesting exception to the requirements of section 1605 of the Recovery Act or the Buy American Act by adding to the offered price of the contract-

(i) 25 percent of the offered price of the contract, if foreign manufactured construction material is incorporated in the offer based on an exception for unreasonable cost of comparable manufactured domestic construction material; and

(ii) 6 percent of the cost of foreign unmanufactured construction material included in the offer based on an exception for the unreasonable cost of comparable domestic unmanufactured construction material.

(2) If the solicitation specifies award on the basis of factors in addition to cost or price, the Contracting Officer will apply the evaluation factors as specified in paragraph (c)(1) of this provision and use the evaluated price in determining the offer that represents the best value to the Government.

(3) Unless paragraph (c)(2) of this provision applies, if two or more offers are equal in price, the Contracting Officer will give preference to an offer that does not include foreign construction material excepted at the request of the offeror on the basis of unreasonable cost of comparable domestic construction material.

(d) Alternate offers.

(1) When an offer includes foreign construction material not listed by the Government in this solicitation in paragraph (b)(3) of the clause at FAR 52.225-21, the offeror also may submit an alternate offer based on use of equivalent domestic construction material.

(2) If an alternate offer is submitted, the offeror shall submit a separate Standard Form 1442 for the alternate offer and a separate cost comparison table prepared in accordance with paragraphs (c) and (d) of the clause at FAR 52.225-21 for the offer that is based on the use of any foreign construction material for which the Government has not yet determined an exception applies.

(3) If the Government determines that a particular exception requested in accordance with paragraph (c) of the clause at FAR 52.225-21 does not apply, the Government will evaluate only those offers based on use of the equivalent domestic construction material, and the offeror shall be required to furnish such domestic construction material. An offer based on use of the foreign construction material for which an exception was requested-

(i) Will be rejected as nonresponsive if this acquisition is conducted by sealed bidding; or

(ii) May be accepted if revised during negotiations.

(End of Provision)

## **2.4 52.228-1 BID GUARANTEE (SEP 1996)**

(a) Failure to furnish a bid guarantee in the proper form and amount, by the time set for opening of bids, may be cause for rejection of the bid.

(b) The bidder shall furnish a bid guarantee in the form of a firm commitment, e.g., bid bond supported by good and sufficient surety or sureties acceptable to the Government, postal money order, certified check, cashier's check, irrevocable letter of credit, or, under Treasury Department regulations, certain bonds or notes of the United States. The Contracting Officer will return bid guarantees, other than bid bonds, (1) to unsuccessful bidders as soon as practicable after the opening of bids, and (2) to the successful bidder upon execution of contractual documents and bonds (including any necessary coinsurance or reinsurance agreements), as required by the bid as accepted.-

(c) The amount of the bid guarantee shall be 20% percent of the bid price or \$100,000.00, whichever is less.-

(d) If the successful bidder, upon acceptance of its bid by the Government within the period specified for acceptance, fails to execute all contractual documents or furnish executed bond(s) within 10 days after receipt of the forms by the bidder, the Contracting Officer may terminate the contract for default.

(e) In the event the contract is terminated for default, the bidder is liable for any cost of acquiring the work that exceeds the amount of its bid, and the bid guarantee is available to offset the difference.

(End of Provision)

## **2.5 52.236-27 SITE VISIT (CONSTRUCTION) (FEB 1995) ALTERNATE I (FEB 1995)**

(a) The clauses at 52.236-2, Differing Site Conditions, and 52.236-3, Site Investigations and Conditions Affecting the Work, will be included in any contract awarded as a result of this solicitation. Accordingly, offerors or quoters are urged and expected to inspect the site where the work will be performed.

(b) An organized site visit has been scheduled for-

December 20, 2012 9:00am

(c) Participants will meet at-

FMS conference room, bldg 18 at Jack C Montgomery VAMC

(End of Provision)

## **2.6 852.211-72 TECHNICAL INDUSTRY STANDARDS (JAN 2008)**

The supplies or equipment required by this invitation for bid or request for proposal must conform to the standards of the and as to . The successful bidder or offeror will be required to submit proof that the item(s) he/she furnishes conforms to this requirement. This proof may be in the form of a label or seal affixed to the equipment or supplies, warranting that they have been tested in accordance with and conform to the specified standards. Proof may also be furnished in the form of a certificate from one of the above listed organizations certifying that the item(s) furnished have been tested in accordance with and conform to the specified standards.

(End of Provision)

## **2.7 VAAR 852.214-70 CAUTION TO BIDDERS--BID ENVELOPES (JAN 2008)**

It is the responsibility of each bidder to take all necessary precautions, including the use of proper mailing cover, to insure that the bid price cannot be ascertained by anyone prior to bid opening. If a bid envelope is furnished with this invitation, the bidder is requested to use this envelope in submitting the bid. The bidder may, however, use any suitable envelope, identified by the invitation number and bid opening time and date. If an Optional Form (OF) 17, Sealed Bid Label, is furnished with this invitation in lieu of a bid envelope, the bidder is advised to complete and affix the OF 17 to the lower left corner of the envelope used in submitting the bid.

(End of Provision)

## **2.8 VAAR 852.228-72 ASSISTING SERVICE-DISABLED VETERAN-OWNED AND VETERAN-OWNED SMALL BUSINESSES IN OBTAINING BONDS (DEC 2009)**

Prime contractors are encouraged to assist service-disabled veteran-owned and veteran-owned small business potential subcontractors in obtaining bonding, when required. Mentor firms are encouraged to assist protégé firms under VA's Mentor-Protégé Program in obtaining acceptable bid, payment, and performance bonds, when required, as a prime contractor under a solicitation or contract and in obtaining any required bonds under subcontracts.

(End of Clause)

## **2.9 VAAR 852.270-1 REPRESENTATIVES OF CONTRACTING OFFICERS (JAN 2008)**

The contracting officer reserves the right to designate representatives to act for him/her in furnishing technical guidance and advice or generally monitor the work to be performed under this contract. Such designation will be in writing and will define the scope and limitation of the designee's authority. A copy of the designation shall be furnished to the contractor.

(End of Provision)

## **2.10 52.252-1 SOLICITATION PROVISIONS INCORPORATED BY REFERENCE (FEB 1998)**

This solicitation incorporates one or more solicitation provisions by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. The offeror is cautioned that the listed provisions may include blocks that must be completed by the offeror and submitted with its quotation or offer. In lieu of submitting the full text of those provisions, the offeror may identify the provision by paragraph identifier and provide the appropriate information with its quotation or offer. Also, the full text of a solicitation provision may be accessed electronically at this/these address(es):

<http://www.acquisition.gov/far/index.html>

<http://www.va.gov/oamm/oa/ars/policyreg/vaar/index.cfm>

(End of Provision)

<b><u>FAR Number</u></b>	<b><u>Title</u></b>	<b><u>Date</u></b>
52.214-3	AMENDMENTS TO INVITATIONS FOR BIDS	DEC 1989
52.214-4	FALSE STATEMENTS IN BIDS	APR 1984
52.214-5	SUBMISSION OF BIDS	MAR 1997
52.214-6	EXPLANATION TO PROSPECTIVE BIDDERS	APR 1984
52.214-7	LATE SUBMISSIONS, MODIFICATIONS, AND WITHDRAWALS OF BIDS	NOV 1999
52.214-18	PREPARATION OF BIDS--CONSTRUCTION	APR 1984
52.214-19	CONTRACT AWARD--SEALED BIDDING--CONSTRUCTION	AUG 1996

## REPRESENTATIONS AND CERTIFICATIONS

### 3.1 52.204-8 ANNUAL REPRESENTATIONS AND CERTIFICATIONS (MAY 2012)

(a)(1) The North American Industry Classification System (NAICS) code for this acquisition is 238220.

(2) The small business size standard is \$14 Million.

(3) The small business size standard for a concern which submits an offer in its own name, other than on a construction or service contract, but which proposes to furnish a product which it did not itself manufacture, is 500 employees.

(b)(1) If the clause at 52.204-7, Central Contractor Registration, is included in this solicitation, paragraph (d) of this provision applies.

(2) If the clause at 52.204-7 is not included in this solicitation, and the offeror is currently registered in CCR, and has completed the ORCA electronically, the offeror may choose to use paragraph (d) of this provision instead of completing the corresponding individual representations and certifications in the solicitation. The offeror shall indicate which option applies by checking one of the following boxes:

☐ (i) Paragraph (d) applies.

☐ (ii) Paragraph (d) does not apply and the offeror has completed the individual representations and certifications in the solicitation.

(c)(1) The following representations or certifications in ORCA are applicable to this solicitation as indicated:

(i) 52.203-2, Certificate of Independent Price Determination. This provision applies to solicitations when a firm-fixed-price contract or fixed-price contract with economic price adjustment is contemplated, unless--

(A) The acquisition is to be made under the simplified acquisition procedures in Part 13;

(B) The solicitation is a request for technical proposals under two-step sealed bidding procedures; or

(C) The solicitation is for utility services for which rates are set by law or regulation.

(ii) 52.203-11, Certification and Disclosure Regarding Payments to Influence Certain Federal Transactions. This provision applies to solicitations expected to exceed \$150,000.

(iii) 52.204-3, Taxpayer Identification. This provision applies to solicitations that do not include the clause at 52.204-7, Central Contractor Registration.

(iv) 52.204-5, Women-Owned Business (Other Than Small Business). This provision applies to solicitations that--

(A) Are not set aside for small business concerns;

(B) Exceed the simplified acquisition threshold; and

(C) Are for contracts that will be performed in the United States or its outlying areas.

(v) 52.209-2, Prohibition on Contracting with Inverted Domestic Corporations--Representation. This provision applies to solicitations using funds appropriated in fiscal years 2008, 2009, 2010, or 2012.

(vi) 52.209-5, Certification Regarding Responsibility Matters. This provision applies to solicitations where the contract value is expected to exceed the simplified acquisition threshold.

(vii) 52.214-14, Place of Performance--Sealed Bidding. This provision applies to invitations for bids except those in which the place of performance is specified by the Government.

(viii) 52.215-6, Place of Performance. This provision applies to solicitations unless the place of performance is specified by the Government.

(ix) 52.219-1, Small Business Program Representations (Basic & Alternate I). This provision applies to solicitations when the contract will be performed in the United States or its outlying areas.

(A) The basic provision applies when the solicitations are issued by other than DoD, NASA, and the Coast Guard.

(B) The provision with its Alternate I applies to solicitations issued by DoD, NASA, or the Coast Guard.

(x) 52.219-2, Equal Low Bids. This provision applies to solicitations when contracting by sealed bidding and the contract will be performed in the United States or its outlying areas.

(xi) 52.222-22, Previous Contracts and Compliance Reports. This provision applies to solicitations that include the clause at 52.222-26, Equal Opportunity.

(xii) 52.222-25, Affirmative Action Compliance. This provision applies to solicitations, other than those for construction, when the solicitation includes the clause at 52.222-26, Equal Opportunity.

(xiii) 52.222-38, Compliance with Veterans' Employment Reporting Requirements. This provision applies to solicitations when it is anticipated the contract award will exceed the simplified acquisition threshold and the contract is not for acquisition of commercial items.

(xiv) 52.223-1, Biobased Product Certification. This provision applies to solicitations that require the delivery or specify the use of USDA-designated items; or include the clause at 52.223-2, Affirmative Procurement of Biobased Products Under Service and Construction Contracts.

(xv) 52.223-4, Recovered Material Certification. This provision applies to solicitations that are for, or specify the use of, EPA-designated items.

(xvi) 52.225-2, Buy American Act Certificate. This provision applies to solicitations containing the clause at 52.225-1.

(xvii) 52.225-4, Buy American Act--Free Trade Agreements--Israeli Trade Act Certificate. (Basic, Alternates I, II, and III.) This provision applies to solicitations containing the clause at 52.225-3.

(A) If the acquisition value is less than \$25,000, the basic provision applies.

(B) If the acquisition value is \$25,000 or more but is less than \$50,000, the provision with its Alternate I applies.

(C) If the acquisition value is \$50,000 or more but is less than \$77,494, the provision with its Alternate II applies.



(D) If the acquisition value is \$77,494 or more but is less than \$100,000, the provision with its Alternate III applies.

(xviii) 52.225-6, Trade Agreements Certificate. This provision applies to solicitations containing the clause at 52.225-5.

(xix) 52.225-20, Prohibition on Conducting Restricted Business Operations in Sudan--Certification. This provision applies to all solicitations.

(xx) 52.225-25, Prohibition on Contracting with Entities Engaging in Sanctioned Activities Relating to Iran--Representation and Certification. This provision applies to all solicitations.

(xxi) 52.226-2, Historically Black College or University and Minority Institution Representation. This provision applies to--

(A) Solicitations for research, studies, supplies, or services of the type normally acquired from higher educational institutions; and

(B) For DoD, NASA, and Coast Guard acquisitions, solicitations that contain the clause at 52.219-23, Notice of Price Evaluation Adjustment for Small Disadvantaged Business Concerns.

(2) The following certifications are applicable as indicated by the Contracting Officer:

[(i) 52.219-22, Small Disadvantaged Business Status.

[(A) Basic.

[(B) Alternate I.

[(ii) 52.222-18, Certification Regarding Knowledge of Child Labor for Listed End Products.

[(iii) 52.222-48, Exemption from Application of the Service Contract Act to Contracts for Maintenance, Calibration, or Repair of Certain Equipment Certification.

[(iv) 52.222-52 Exemption from Application of the Service Contract Act to Contracts for Certain Services--Certification.

[(v) 52.223-9, with its Alternate I, Estimate of Percentage of Recovered Material Content for EPA-Designated Products (Alternate I only).

[(vi) 52.227-6, Royalty Information.

[(A) Basic.

[(B) Alternate I.

[(vii) 52.227-15, Representation of Limited Rights Data and Restricted Computer Software.

(d) The offeror has completed the annual representations and certifications electronically via the Online Representations and Certifications Application (ORCA) website accessed through <https://www.acquisition.gov>. After reviewing the ORCA database information, the offeror verifies by submission of the offer that the representations and certifications currently posted electronically that apply to this solicitation as indicated in paragraph (c) of this provision

have been entered or updated within the last 12 months, are current, accurate, complete, and applicable to this solicitation (including the business size standard applicable to the NAICS code referenced for this solicitation), as of the date of this offer and are incorporated in this offer by reference (see FAR 4.1201); except for the changes identified below [offeror to insert changes, identifying change by clause number, title, date]. These amended representation(s) and/or certification(s) are also incorporated in this offer and are current, accurate, and complete as of the date of this offer.

FAR Clause #	Title	Date	Change
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Any changes provided by the offeror are applicable to this solicitation only, and do not result in an update to the representations and certifications posted on ORCA.

(End of Provision)

### 3.2 52.225-20 PROHIBITION ON CONDUCTING RESTRICTED BUSINESS OPERATIONS IN SUDAN--CERTIFICATION (AUG 2009)

(a) *Definitions.* As used in this provision-- "Business operations" means engaging in commerce in any form, including by acquiring, developing, maintaining, owning, selling, possessing, leasing, or operating equipment, facilities, personnel, products, services, personal property, real property, or any other apparatus of business or commerce.

"Marginalized populations of Sudan" means--

(1) Adversely affected groups in regions authorized to receive assistance under section 8(c) of the Darfur Peace and Accountability Act (Pub. L. 109-344) (50 U.S.C. 1701 note); and

(2) Marginalized areas in Northern Sudan described in section 4(9) of such Act.

"Restricted business operations" means business operations in Sudan that include power production activities, mineral extraction activities, oil-related activities, or the production of military equipment, as those terms are defined in the Sudan Accountability and Divestment Act of 2007 (Pub. L. 110-174). Restricted business operations do not include business operations that the person (as that term is defined in Section 2 of the Sudan Accountability and Divestment Act of 2007) conducting the business can demonstrate-

(1) Are conducted under contract directly and exclusively with the regional government of southern Sudan;

(2) Are conducted pursuant to specific authorization from the Office of Foreign Assets Control in the Department of the Treasury, or are expressly exempted under Federal law from the requirement to be conducted under such authorization;

(3) Consist of providing goods or services to marginalized populations of Sudan;

(4) Consist of providing goods or services to an internationally recognized peacekeeping force or humanitarian organization;

(5) Consist of providing goods or services that are used only to promote health or education; or

(6) Have been voluntarily suspended.

(b) *Certification*. By submission of its offer, the offeror certifies that the offeror does not conduct any restricted business operations in Sudan.

(End of Provision)

<u>FAR Number</u>	<u>Title</u>	<u>Date</u>
52.225-25	PROHIBITION ON CONTRACTING WITH ENTITIES ENGAGING IN SANCTIONED ACTIVITIES RELATING TO IRAN-- REPRESENTATION AND CERTIFICATION	NOV 2011

## GENERAL CONDITIONS

### 4.1 52.211-10 COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK (APR 1984) ALTERNATE I (APR 1984)

The Contractor shall be required to (a) commence work under this contract within 10 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 150 calendar days after receipt of notice to proceed. The time stated for completion shall include final cleanup of the premises.

The completion date is based on the assumption that the successful offeror will receive the notice to proceed by 10 days after award. The completion date will be extended by the number of calendar days after the above date that the Contractor receives the notice to proceed, except to the extent that the delay in issuance of the notice to proceed results from the failure of the Contractor to execute the contract and give the required performance and payment bonds within the time specified in the offer.

(End of Clause)

### 4.2 52.219-28 POST-AWARD SMALL BUSINESS PROGRAM REREPRESENTATION (APR 2012)

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

*Long-term contract* means a contract of more than five years in duration, including options. However, the term does not include contracts that exceed five years in duration because the period of performance has been extended for a cumulative period not to exceed six months under the clause at 52.217-8, Option to Extend Services, or other appropriate authority.

*Small business concern* means a concern, including its affiliates, that is independently owned and operated, not dominant in the field of operation in which it is bidding on Government contracts, and qualified as a small business under the criteria in 13 CFR part 121 and the size standard in paragraph (c) of this clause. Such a concern is "not dominant in its field of operation" when it does not exercise a controlling or major influence on a national basis in a kind of business activity in which a number of business concerns are primarily engaged. In determining whether dominance exists, consideration shall be given to all appropriate factors, including volume of business, number of employees, financial resources, competitive status or position, ownership or control of materials, processes, patents, license agreements, facilities, sales territory, and nature of business activity.

(b) If the Contractor represented that it was a small business concern prior to award of this contract, the Contractor shall rerepresent its size status according to paragraph (e) of this clause or, if applicable, paragraph (g) of this clause, upon the occurrence of any of the following:

(1) Within 30 days after execution of a novation agreement or within 30 days after modification of the contract to include this clause, if the novation agreement was executed prior to inclusion of this clause in the contract.

(2) Within 30 days after a merger or acquisition that does not require a novation or within 30 days after modification of the contract to include this clause, if the merger or acquisition occurred prior to inclusion of this clause in the contract.

(3) For long-term contracts-

(i) Within 60 to 120 days prior to the end of the fifth year of the contract; and

(ii) Within 60 to 120 days prior to the date specified in the contract for exercising any option thereafter.

(c) The Contractor shall rerepresent its size status in accordance with the size standard in effect at the time of this rerepresentation that corresponds to the North American Industry Classification System (NAICS) code assigned to this contract. The small business size standard corresponding to this NAICS code can be found at <http://www.sba.gov/content/table-small-business-size-standards>.

(d) The small business size standard for a Contractor providing a product which it does not manufacture itself, for a contract other than a construction or service contract, is 500 employees.

(e) Except as provided in paragraph (g) of this clause, the Contractor shall make the rerepresentation required by paragraph (b) of this clause by validating or updating all its representations in the Online Representations and Certifications Application and its data in the Central Contractor Registration, as necessary, to ensure that they reflect the Contractor's current status. The Contractor shall notify the contracting office in writing within the timeframes specified in paragraph (b) of this clause that the data have been validated or updated, and provide the date of the validation or update.

(f) If the Contractor represented that it was other than a small business concern prior to award of this contract, the Contractor may, but is not required to, take the actions required by paragraphs (e) or (g) of this clause.

(g) If the Contractor does not have representations and certifications in ORCA, or does not have a representation in ORCA for the NAICS code applicable to this contract, the Contractor is required to complete the following rerepresentation and submit it to the contracting office, along with the contract number and the date on which the rerepresentation was completed:

The Contractor represents that it [ ] is, [ ] is not a small business concern under NAICS Code 238220 assigned to contract number .

*[Contractor to sign and date and insert authorized signer's name and title].*

(End of Clause)

### **4.3 52.225-21 REQUIRED USE OF AMERICAN IRON, STEEL, AND MANUFACTURED GOODS--BUY AMERICAN ACT--CONSTRUCTION MATERIALS (OCT 2010)**

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

"Component" means an article, material, or supply incorporated directly into a construction material.

"Construction material" means an article, material, or supply brought to the construction site by the Contractor or a subcontractor for incorporation into the building or work. The term also includes an item brought to the site preassembled from articles, materials, or supplies. However, emergency life safety systems, such as emergency lighting,

fire alarm, and audio evacuation systems, that are discrete systems incorporated into a public building or work and that are produced as complete systems, are evaluated as a single and distinct construction material regardless of when or how the individual parts or components of those systems are delivered to the construction site.

"Domestic construction material" means the following--

- (1) An unmanufactured construction material mined or produced in the United States. (The Buy American Act applies.)
- (2) A manufactured construction material that is manufactured in the United States and, if the construction material consists wholly or predominantly of iron or steel, the iron or steel was produced in the United States. (Section 1605 of the Recovery Act applies.)

"Foreign construction material" means a construction material other than a domestic construction material.

"Manufactured construction material" means any construction material that is not unmanufactured construction material.

"Steel" means an alloy that includes at least 50 percent iron, between .02 and 2 percent carbon, and may include other elements.

"United States" means the 50 States, the District of Columbia, and outlying areas.

"Unmanufactured construction material" means raw material brought to the construction site for incorporation into the building or work that has not been--

- (1) Processed into a specific form and shape; or
- (2) Combined with other raw material to create a material that has different properties than the properties of the individual raw materials.

(b) Domestic preference.

(1) This clause implements--

(i) Section 1605 of the American Recovery and Reinvestment Act of 2009 (Recovery Act) (Pub. L. 111-5), by requiring, unless an exception applies, that all manufactured construction material in the project is manufactured in the United States and, if the construction material consists wholly or predominantly of iron or steel, the iron or steel was produced in the United States (produced in the United States means that all manufacturing processes of the iron or steel must take place in the United States, except metallurgical processes involving refinement of steel additives); and

(ii) The Buy American Act (41 U.S.C. 10a-10d) by providing a preference for unmanufactured construction material mined or produced in the United States over unmanufactured construction material mined or produced in a foreign country.

(2) The Contractor shall use only domestic construction material in performing this contract, except as provided in paragraph (b)(3) and (b)(4) of this clause.

(3) This requirement does not apply to the construction material or components listed by the Government as follows:

Lead Glass

(4) The Contracting Officer may add other foreign construction material to the list in paragraph (b)(3) of this clause if the Government determines that--

(i) The cost of domestic construction material would be unreasonable;

(A) The cost of domestic manufactured construction material, when compared to the cost of comparable foreign manufactured construction material, is unreasonable when the cumulative cost of such material will increase the cost of the contract by more than 25 percent;

(B) The cost of domestic unmanufactured construction material is unreasonable when the cost of such material exceeds the cost of comparable foreign unmanufactured construction material by more than 6 percent;

(ii) The construction material is not mined, produced, or manufactured in the United States in sufficient and reasonably available quantities and of a satisfactory quality;

(iii) The application of the restriction of section 1605 of the Recovery Act to a particular manufactured construction material would be inconsistent with the public interest or the application of the Buy American Act to a particular unmanufactured construction material would be impracticable or inconsistent with the public interest.

(c) Request for determination of inapplicability of Section 1605 of the Recovery Act or the Buy American Act.

(1)(i) Any Contractor request to use foreign construction material in accordance with paragraph (b)(4) of this clause shall include adequate information for Government evaluation of the request, including-

(A) A description of the foreign and domestic construction materials;

(B) Unit of measure;

(C) Quantity;

(D) Cost;

(E) Time of delivery or availability;

(F) Location of the construction project;

(G) Name and address of the proposed supplier; and

(H) A detailed justification of the reason for use of foreign construction materials cited in accordance with paragraph (b)(4) of this clause.

(ii) A request based on unreasonable cost shall include a reasonable survey of the market and a completed cost comparison table in the format in paragraph (d) of this clause.

(iii) The cost of construction material shall include all delivery costs to the construction site and any applicable duty.

(iv) Any Contractor request for a determination submitted after contract award shall explain why the Contractor could not reasonably foresee the need for such determination and could not have requested the determination before contract award. If the Contractor does not submit a satisfactory explanation, the Contracting Officer need not make a determination.

(2) If the Government determines after contract award that an exception to section 1605 of the Recovery Act or the Buy American Act applies and the Contracting Officer and the Contractor negotiate adequate consideration, the Contracting Officer will modify the contract to allow use of the foreign construction material. However, when the basis for the exception is the unreasonable cost of a domestic construction material, adequate consideration is not less than the differential established in paragraph (b)(4)(i) of this clause.

(3) Unless the Government determines that an exception to section 1605 of the Recovery Act or the Buy American Act applies, use of foreign construction material is noncompliant with section 1605 of the American Recovery and Reinvestment Act or the Buy American Act.

(d) *Data.* To permit evaluation of requests under paragraph (c) of this clause based on unreasonable cost, the Contractor shall include the following information and any applicable supporting data based on the survey of suppliers:

Foreign and Domestic Construction Materials Cost Comparison

Construction Material Description	Unit of Measure	Quantity	Cost (Dollars)*
Item 1:			
Foreign Construction Material			
Domestic Construction Material			
Item 2:			
Foreign Construction Material			
Domestic Construction Material			

[List name, address, telephone number, and contact for suppliers surveyed. Attach copy of response; if oral, attach summary.]  
[Include other applicable supporting information.]  
[\* Include all delivery costs to the construction site.]

(End of Clause)

4.4 52.228-13 ALTERNATIVE PAYMENT PROTECTIONS (JULY 2000)

(a) The Contractor shall submit one of the following payment protections:

Performance Bond

- (b) The amount of the payment protection shall be 100 percent of the contract price.
- (c) The submission of the payment protection is required within 10 days of contract award.
- (d) The payment protection shall provide protection for the full contract performance period plus a one-year period.



(e) Except for escrow agreements and payment bonds, which provide their own protection procedures, the Contracting Officer is authorized to access funds under the payment protection when it has been alleged in writing by a supplier of labor or material that a nonpayment has occurred, and to withhold such funds pending resolution by administrative or judicial proceedings or mutual agreement of the parties.

(f) When a tripartite escrow agreement is used, the Contractor shall utilize only suppliers of labor and material that signed the escrow agreement.

(End of Clause)

#### **4.5 52.236-21 SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION (FEB 1997) ALTERNATE II (APR 1984)**

(a) The Contractor shall keep on the work site a copy of the drawings and specifications and shall at all times give the Contracting Officer access thereto. Anything mentioned in the specifications and not shown on the drawings, or shown on the drawings and not mentioned in the specifications, shall be of like effect as if shown or mentioned in both. In case of difference between drawings and specifications, the specifications shall govern. In case of discrepancy in figures, in the drawings, or in the specifications, the matter shall be promptly submitted to the Contracting Officer, who shall promptly make a determination in writing. Any adjustment by the Contractor without such a determination shall be at its own risk and expense. The Contracting Officer shall furnish from time to time such detailed drawings and other information as considered necessary, unless otherwise provided.

(b) Wherever in the specifications or upon the drawings the words "directed," "required," "ordered," "designated," "prescribed," or words of like import are used, it shall be understood that the "direction," "requirement," "order," "designation," or "prescription," of the Contracting Officer is intended and similarly the words "approved," "acceptable," "satisfactory," or words of like import shall mean "approved by," or "acceptable to," or "satisfactory to" the Contracting Officer, unless otherwise expressly stated.

(c) Where "as shown," "as indicated," "as detailed," or words of similar import are used, it shall be understood that the reference is made to the drawings accompanying this contract unless stated otherwise. The word "provided" as used herein shall be understood to mean "provide complete in place," that is "furnished and installed."

(d) Shop drawings means drawings, submitted to the Government by the Contractor, subcontractor, or any lower tier subcontractor pursuant to a construction contract, showing in detail (1) the proposed fabrication and assembly of structural elements and (2) the installation (i.e., form, fit, and attachment details) of materials of equipment. It includes drawings, diagrams, layouts, schematics, descriptive literature, illustrations, schedules, performance and test data, and similar materials furnished by the contractor to explain in detail specific portions of the work required by the contract. The Government may duplicate, use, and disclose in any manner and for any purpose shop drawings delivered under this contract.

(e) If this contract requires shop drawings, the Contractor shall coordinate all such drawings, and review them for accuracy, completeness, and compliance with contract requirements and shall indicate its approval thereon as evidence of such coordination and review. Shop drawings submitted to the Contracting Officer without evidence of the Contractor's approval may be returned for resubmission. The Contracting Officer will indicate an approval or disapproval of the shop drawings and if not approved as submitted shall indicate the Government's reasons therefor.

Any work done before such approval shall be at the Contractor's risk. Approval by the Contracting Officer shall not relieve the Contractor from responsibility for any errors or omissions in such drawings, nor from responsibility for complying with the requirements of this contract, except with respect to variations described and approved in accordance with (f) below.

(f) If shop drawings show variations from the contract requirements, the Contractor shall describe such variations in writing, separate from the drawings, at the time of submission. If the Contracting Officer approves any such variation, the Contracting Officer shall issue an appropriate contract modification, except that, if the variation is minor or does not involve a change in price or in time of performance, a modification need not be issued.

(g) The Contractor shall submit to the Contracting Officer for approval four copies (unless otherwise indicated) of all shop drawings as called for under the various headings of these specifications. Three sets (unless otherwise indicated) of all shop drawings, will be retained by the Contracting Officer and one set will be returned to the Contractor. Upon completing the work under this contract, the Contractor shall furnish 1 sets of prints of all shop drawings as finally approved. These drawings shall show changes and revisions made up to the time the equipment is completed and accepted.

(End of Clause)

#### **4.6 VAAR 852.203-70 COMMERCIAL ADVERTISING (JAN 2008)**

The bidder or offeror agrees that if a contract is awarded to him/her, as a result of this solicitation, he/she will not advertise the award of the contract in his/her commercial advertising in such a manner as to state or imply that the Department of Veterans Affairs endorses a product, project or commercial line of endeavor.

(End of Clause)

#### **4.7 VAAR 852.211-73 BRAND NAME OR EQUAL (JAN 2008)**

(Note: as used in this clause, the term "brand name" includes identification of products by make and model.)

(a) If items called for by this invitation for bids have been identified in the schedule by a "brand name or equal" description, such identification is intended to be descriptive, but not restrictive, and is to indicate the quality and characteristics of products that will be satisfactory. Bids offering "equal" products (including products of the brand name manufacturer other than the one described by brand name) will be considered for award if such products are clearly identified in the bids and are determined by the Government to meet fully the salient characteristics requirements listed in the invitation.

(b) Unless the bidder clearly indicates in the bid that the bidder is offering an "equal" product, the bid shall be considered as offering a brand name product referenced in the invitation for bids.

(c)(1) If the bidder proposes to furnish an "equal" product, the brand name, if any, of the product to be furnished shall be inserted in the space provided in the invitation for bids, or such product shall be otherwise clearly identified in the bid. The evaluation of bids and the determination as to equality of the product offered shall be the responsibility of the Government and will be based on information furnished by the bidder or identified in his/her bid as well as other information reasonably available to the purchasing activity. CAUTION TO BIDDERS. The purchasing activity is not responsible for locating or securing any information that is not identified in the bid and reasonably available to the purchasing activity. Accordingly, to insure that sufficient information is available, the bidder must furnish as a part of

his/her bid all descriptive material (such as cuts, illustrations, drawings or other information) necessary for the purchasing activity to:

(i) Determine whether the product offered meets the salient characteristics requirement of the Invitation for Bids, and

(ii) Establish exactly what the bidder proposes to furnish and what the Government would be binding itself to purchase by making an award. The information furnished may include specific references to information previously furnished or to information otherwise available to the purchasing activity.

(2) If the bidder proposes to modify a product so as to make it conform to the requirements of the Invitation for Bids, he/she shall:

(i) Include in his/her bid a clear description of such proposed modifications, and

(ii) Clearly mark any descriptive material to show the proposed modifications.

(3) Modifications proposed after bid opening to make a product conform to a brand name product referenced in the Invitation for Bids will not be considered.

(End of Clause)

#### **4.9 VAAR 852.219-10 VA NOTICE OF TOTAL SERVICE-DISABLED VETERAN-OWNED SMALL BUSINESS SET-ASIDE (DEC 2009)**

(a) Definition. For the Department of Veterans Affairs, "Service-disabled veteran-owned small business concern":

(1) Means a small business concern:

(i) Not less than 51 percent of which is owned by one or more service-disabled veterans or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more service-disabled veterans (or eligible surviving spouses);

(ii) The management and daily business operations of which are controlled by one or more service-disabled veterans (or eligible surviving spouses) or, in the case of a service-disabled veteran with permanent and severe disability, the spouse or permanent caregiver of such veteran;

(iii) The business meets Federal small business size standards for the applicable North American Industry Classification System (NAICS) code identified in the solicitation document; and

(iv) The business has been verified for ownership and control and is so listed in the Vendor Information Pages database, (<http://www.VetBiz.gov>).

(2) "Service-disabled veteran" means a veteran, as defined in 38 U.S.C. 101(2), with a disability that is service-connected, as defined in 38 U.S.C. 101(16).

(b) *General.* (1) Offers are solicited only from service-disabled veteran-owned small business concerns. Offers received from concerns that are not service-disabled veteran-owned small business concerns shall not be considered.

(2) Any award resulting from this solicitation shall be made to a service-disabled veteran-owned small business concern.

(c) Agreement. A service-disabled veteran-owned small business concern agrees that in the performance of the contract, in the case of a contract for:

(1) Services (except construction), at least 50 percent of the cost of personnel for contract performance will be spent for employees of the concern or employees of other eligible service-disabled veteran-owned small business concerns;

(2) Supplies (other than acquisition from a nonmanufacturer of the supplies), at least 50 percent of the cost of manufacturing, excluding the cost of materials, will be performed by the concern or other eligible service-disabled veteran-owned small business concerns;

(3) General construction, at least 15 percent of the cost of the contract performance incurred for personnel will be spent on the concern's employees or the employees of other eligible service-disabled veteran-owned small business concerns; or

(4) Construction by special trade contractors, at least 25 percent of the cost of the contract performance incurred for personnel will be spent on the concern's employees or the employees of other eligible service-disabled veteran-owned small business concerns.

(d) A joint venture may be considered a service-disabled veteran owned small business concern if--

(1) At least one member of the joint venture is a service-disabled veteran-owned small business concern, and makes the following representations: That it is a service-disabled veteran-owned small business concern, and that it is a small business concern under the North American Industry Classification Systems (NAICS) code assigned to the procurement;

(2) Each other concern is small under the size standard corresponding to the NAICS code assigned to the procurement; and

(3) The joint venture meets the requirements of paragraph 7 of the explanation of Affiliates in 19.101 of the Federal Acquisition Regulation.

(4) The joint venture meets the requirements of 13 CFR 125.15(b).

(e) Any service-disabled veteran-owned small business concern (non-manufacturer) must meet the requirements in 19.102(f) of the Federal Acquisition Regulation to receive a benefit under this program.

(End of Clause)

#### **4.10 VAAR 852.228-70 BOND PREMIUM ADJUSTMENT (JAN 2008)**

When net changes in original contract price affect the premium of a Corporate Surety Bond by \$5 or more, the Government, in determining the basis for final settlement, will provide for bond premium adjustment computed at the rate shown in the bond.

(End of Clause)

#### **4.11 VAAR 852.236-71 SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION (JUL 2002)**

The clause entitled "Specifications and Drawings for Construction" in FAR 52.236-21 is supplemented as follows:

(a) The contracting officer's interpretation of the drawings and specifications will be final, subject to the disputes clause.

(b) Large scale drawings supersede small scale drawings.

(c) Dimensions govern in all cases. Scaling of drawings may be done only for general location and general size of items.

(d) Dimensions shown of existing work and all dimensions required for work that is to connect with existing work shall be verified by the contractor by actual measurement of the existing work. Any work at variance with that specified or shown in the drawings shall not be performed by the contractor until approved in writing by the contracting officer.

(End of Clause)

#### **4.12 VAAR 852.236-74 INSPECTION OF CONSTRUCTION (JUL 2002)**

The clause entitled "Inspection of Construction" in FAR 52.246-12 is supplemented as follows:

(a) Inspection of materials and articles furnished under this contract will be made at the site by the resident engineer, unless otherwise provided for in the specifications.

(b) Final inspection will not be made until the contract work is ready for beneficial use or occupancy. The contractor shall notify the contracting officer, through the resident engineer, fifteen (15) days prior to the date on which the work will be ready for final inspection.

(End of Clause)

#### **4.13 VAAR 852.236-76 CORRESPONDENCE (APR 1984)**

All correspondence relative to this contract shall bear Specification Number, Project Number, Department of Veterans Affairs Contract Number, title of project and name of facility.

(End of Clause)

#### **4.14 VAAR 852.236-77 REFERENCE TO "STANDARDS" (JUL 2002)**

Any materials, equipment, or workmanship specified by references to number, symbol, or title of any specific Federal, Industry or Government Agency Standard Specification shall comply with all applicable provisions of such standard specifications, except as limited to type, class or grade, or modified in contract specifications. Reference to "Standards" referred to in the contract specifications, except as modified, shall have full force and effect as though printed in detail in specifications.

(End of Clause)

#### **4.15 VAAR 852.236-78 GOVERNMENT SUPERVISION (APR 1984)**

(a) The work will be under the direction of the Department of Veterans Affairs contracting officer, who may designate another VA employee to act as resident engineer at the construction site.

(b) Except as provided below, the resident engineer's directions will not conflict with or change contract requirements.

(c) Within the limits of any specific authority delegated by the contracting officer, the resident engineer may, by written direction, make changes in the work. The contractor shall be advised of the extent of such authority prior to execution of any work under the contract.

(End of Clause)

#### **4.16 VAAR 852.236-79 DAILY REPORT OF WORKERS AND MATERIAL (APR 1984)**

The contractor shall furnish to the resident engineer each day a consolidated report for the preceding work day in which is shown the number of laborers, mechanics, foremen/forewomen and pieces of heavy equipment used or employed by the contractor and subcontractors. The report shall bear the name of the firm, the branch of work which they perform such as concrete, plastering, masonry, plumbing, sheet metal work, etc. The report shall give a breakdown of employees by crafts, location where employed, and work performed. The report shall also list materials delivered to the site on the date covered by the report.

(End of Clause)

#### **4.17 VAAR 852.236-80 SUBCONTRACTS AND WORK COORDINATION (APR 1984) ALTERNATE I (JUL 2002)**

(a) Nothing contained in this contract shall be construed as creating any contractual relationship between any subcontractor and the Government. Divisions or sections of specifications are not intended to control the contractor in dividing work among subcontractors, or to limit work performed by any trade.

(b) The contractor shall be responsible to the Government for acts and omissions of his/her own employees, and subcontractors and their employees. The contractor shall also be responsible for coordination of the work of the trades, subcontractors, and material suppliers. The contractor shall, in advance of the work, prepare coordination drawings showing the location of openings through slabs, the pipe sleeves and hanger inserts, as well as the location and elevation of utility lines, including, but not limited to, conveyor systems, pneumatic tubes, ducts, and conduits and pipes 2 inches and larger in diameter. These drawings, including plans, elevations, and sections as appropriate shall clearly show the manner in which the utilities fit into the available space and relate to each other and to existing building elements. Drawings shall be of appropriate scale to satisfy the previously stated purposes, but not smaller than 3/8-inch scale. Drawings may be composite (with distinctive colors for the various trades) or may be separate but fully coordinated drawings (such as sepias or photographic paper reproducibles) of the same scale. Separate drawings shall depict identical building areas or sections and shall be capable of being overlaid in any combination. The submitted drawings for a given area of the project shall show the work of all trades which will be involved in that particular area. Six complete composite drawings or six complete sets of separate reproducible drawings shall be received by the Government not less than 20 days prior to the scheduled start of the work in the area illustrated by the drawings, for the purpose of showing the contractor's planned methods of installation. The objectives of such drawings are to promote carefully planned work sequence and proper trade coordination, in order to assure the expeditious solutions of problems and the installation of lines and equipment as contemplated by the contract documents while avoiding or minimizing additional costs to the contractor and to the Government. In the event the contractor, in coordinating the various installations and in planning the method of installation, finds a conflict in location or elevation of any of the utilities with themselves, with structural items or with other construction items, he/she shall bring this conflict to the attention of the contracting officer immediately. In doing so, the contractor shall explain the proposed method of solving the problem or shall request instructions as to how to proceed if adjustments beyond those of usual trades coordination are necessary. Utilities installation work will not proceed in any area prior to the submission and completion of the Government review of the coordinated drawings for that area, nor in any area in which conflicts are disclosed by the coordination drawings until the conflicts have been corrected to the satisfaction of the contracting officer. It is the responsibility of the contractor to submit the required drawings in a timely manner consistent with the requirements to complete the work covered by this contract within the prescribed contract time.

(c) The Government or its representatives will not undertake to settle any differences between the contractor and subcontractors or between subcontractors.

(d) The Government reserves the right to refuse to permit employment on the work or require dismissal from the work of any subcontractor who, by reason of previous unsatisfactory work on Department of Veterans Affairs projects or for any other reason, is considered by the contracting officer to be incompetent or otherwise objectionable.

(End of Clause)

#### **4.18 VAAR 852.236-82 PAYMENTS UNDER FIXED-PRICE CONSTRUCTION CONTRACTS (WITHOUT NAS) (APR 1984)**

(a) Retainage:

(1) The contracting officer may retain funds:

(i) Where performance under the contract has been determined to be deficient or the contractor has performed in an unsatisfactory manner in the past; or

(ii) As the contract nears completion, to ensure that deficiencies will be corrected and that completion is timely.

(2) Examples of deficient performance justifying a retention of funds include, but are not restricted to, the following:

(i) Unsatisfactory progress as determined by the contracting officer;

(ii) Failure to meet schedule in Schedule of Work Progress;

(iii) Failure to present submittals in a timely manner; or

(iv) Failure to comply in good faith with approved subcontracting plans, certifications, or contract requirements.

(3) Any level of retention shall not exceed 10 percent either where there is determined to be unsatisfactory performance, or when the retainage is to ensure satisfactory completion. Retained amounts shall be paid promptly upon completion of all contract requirements, but nothing contained in this subparagraph shall be construed as limiting the contracting officer's right to withhold funds under other provisions of the contract or in accordance with the general law and regulations regarding the administration of Government contracts.

(b) The contractor shall submit a schedule of cost to the contracting officer for approval within 30 calendar days after date of receipt of notice to proceed. Such schedule will be signed and submitted in triplicate. The approved cost schedule will be one of the bases for determining progress payments to the contractor for work completed. This schedule shall show cost by the branches of work for each building or unit of the contract, as instructed by the resident engineer.

(1) The branches shall be subdivided into as many sub-branches as are necessary to cover all component parts of the contract work.

(2) Costs as shown on this schedule must be true costs and, should the resident engineer so desire, he/she may require the contractor to submit the original estimate sheets or other information to substantiate the detailed makeup of the schedule.

(3) The sum of the sub-branches, as applied to each branch, shall equal the total cost of such branch. The total cost of all branches shall equal the contract price.

(4) Insurance and similar items shall be prorated and included in the cost of each branch of the work.

(5) The cost schedule shall include separate cost information for the systems listed in the table in this paragraph (b)(5). The percentages listed below are proportions of the cost listed in the contractor's cost schedule and identify, for payment purposes, the value of the work to adjust, correct and test systems after the material has been installed. Payment of the listed percentages will be made only after the contractor has demonstrated that each of the systems is substantially complete and operates as required by the contract.

VALUE OF ADJUSTING, CORRECTING, AND TESTING SYSTEM

System	Percent
Pneumatic tube system	10
Incinerators (medical waste and trash)	5
Sewage treatment plant equipment	5
Water treatment plant equipment	5
Washers (dish, cage, glass, etc.)	5
Sterilizing equipment	5
Water distilling equipment	5
Prefab temperature rooms (cold, constant temperature)	5
Entire air-conditioning system (Specified under 600 Sections)	5
Entire boiler plant system (Specified under 700 Sections)	5
General supply conveyors	10
Food service conveyors	10
Pneumatic soiled linen and trash system	10
Elevators and dumbwaiters	10
Materials transport system	10
Engine-generator system	5



Primary switchgear	5
Secondary switchgear	5
Fire alarm system	5
Nurse call system	5
Intercom system	5
Radio system	5
TV (entertainment) system	5

(c) In addition to this cost schedule, the contractor shall submit such unit costs as may be specifically requested. The unit costs shall be those used by the contractor in preparing his/her bid and will not be binding as pertaining to any contract changes.

(d) The contracting officer will consider for monthly progress payments material and/or equipment procured by the contractor and stored on the construction site, as space is available, or at a local approved location off the site, under such terms and conditions as such officer approves, including but not limited to the following:

(1) The material or equipment is in accordance with the contract requirements and/or approved samples and shop drawings.

(2) Only those materials and/or equipment as are approved by the resident engineer for storage will be included.

(3) Such materials and/or equipment will be stored separately and will be readily available for inspection and inventory by the resident engineer.

(4) Such materials and/or equipment will be protected against weather, theft and other hazards and will not be subjected to deterioration.

(5) All of the other terms, provisions, conditions and covenants contained in the contract shall be and remain in full force and effect as therein provided.

(6) A supplemental agreement will be executed between the Government and the contractor with the consent of the contractor's surety for off-site storage.

(e) The contractor, prior to receiving a progress or final payment under this contract, shall submit to the contracting officer a certification that the contractor has made payment from proceeds of prior payments, or that timely payment will be made from the proceeds of the progress or final payment then due, to subcontractors and suppliers in accordance with the contractual arrangements with them.

(f) The Government reserves the right to withhold payment until samples, shop drawings, engineer's certificates, additional bonds, payrolls, weekly statements of compliance, proof of title, nondiscrimination compliance reports, or any other things required by this contract, have been submitted to the satisfaction of the contracting officer.

(End of Clause)

#### 4.19 VAAR 852.236-84 SCHEDULE OF WORK PROGRESS (NOV 1984)

(a) The contractor shall submit with the schedule of costs, a progress schedule that indicates the anticipated installation of work versus the elapsed contract time, for the approval of the contracting officer. The progress schedule time shall be represented in the form of a bar graph with the contract time plotted along the horizontal axis. The starting date of the schedule shall be the date the contractor receives the "Notice to Proceed." The ending date shall be the original contract completion date. At a minimum, both dates shall be indicated on the progress schedule. The specific item of work, i.e., "Excavation", "Floor Tile", "Finish Carpentry", etc., should be plotted along the vertical axis and indicated by a line or bar at which time(s) during the contract this work is scheduled to take place. The schedule shall be submitted in triplicate and signed by the contractor.

(b) The actual percent completion will be based on the value of installed work divided by the current contract amount. The actual completion percentage will be indicated on the monthly progress report.

(c) The progress schedule will be revised when individual or cumulative time extensions of 15 calendar days or more are granted for any reason. The revised schedule should indicate the new contract completion date and should reflect any changes to the installation time(s) of the items of work affected.

(d) The revised progress schedule will be used for reporting future scheduled percentage completion.

(End of Clause)

#### ADDITIONAL REQUIREMENTS FOR BAR CHART SCHEDULE

A. Original Schedule: The following information shall be furnished as minimum for each activity on the initial bar chart schedule.

- Activity Description
- Estimated Duration
- Responsibility (Trade) and Manpower (Crew size)
- Planned Start and Completion Dates
- Activity Cost

#### B. Updated Schedules and Updating Procedures

(1) The contractor shall submit, at intervals of 30 calendar days, an updated bar chart schedule of the actual construction progress. The bar chart schedule shall show the activities or portions of activities started and/or completed during the reporting period and their updated monetary percentage value(s) as a basis for the contractor's monthly progress report (payment request).

(2) The contractor shall adjust the activity bars on the bar chart schedule to reflect the actual progress and the remaining activity durations. The updated bar chart schedule shall show at a minimum the following:

- Actual start and completion dates for activities started and/or completed during the reporting period.
- VA issued changes to the original contract requirements that change the contractor's original sequence of work.
- Contractor changes in work sequence, durations, responsibility, manpower, and activity costs.

C. All contract changes durations proposed by the contractor shall be reviewed and approved by the Contracting Officer prior to insertion into the updated bar chart schedule. The updated bar chart schedule shall include all contract changes issued during the reporting period.

(End of Clause)

#### **4.20 VAAR 852.236-85 SUPPLEMENTARY LABOR STANDARDS PROVISIONS (APR 1984)**

(a) The wage determination decision of the Secretary of Labor is set forth in section GR, General Requirements, of this contract. It is the result of a study of wage conditions in the locality and establishes the minimum hourly rates of wages and fringe benefits for the described classes of labor in accordance with applicable law. No increase in the contract price will be allowed or authorized because of payment of wage rates in excess of those listed.

(b) The contractor shall submit the required copies of payrolls to the contracting officer through the resident engineer or engineer officer, when acting in that capacity. Department of Labor Form WH- 347, Payroll, available from the Superintendent of Documents, Government Printing Office, Washington, DC 20402, may be used for this purpose. If, however, the contractor or subcontractor elects to use an individually composed payroll form, it shall contain the same information shown on Form WH-347, and in addition be accompanied by Department of Labor Form WH-348, Statement of Compliance, or any other form containing the exact wording of this form.

(End of Clause)

#### **4.21 VAAR 852.236-86 WORKER'S COMPENSATION (JAN 2008)**

Public Law 107-217 (40 U.S.C. 3172) authorizes the constituted authority of States to apply their workers compensation laws to all lands and premises owned or held by the United States.

(End of Clause)

#### **4.22 VAAR 852.236-87 ACCIDENT PREVENTION (SEP 1993)**

The Resident Engineer on all assigned construction projects, or other Department of Veterans Affairs employee if designated in writing by the Contracting Officer, shall serve as Safety Officer and as such has authority, on behalf of the Contracting Officer, to monitor and enforce Contractor compliance with FAR 52.236-13, Accident Prevention. However, only the Contracting Officer may issue an order to stop all or part of the work while requiring satisfactory or corrective action to be taken by the Contractor.

(End of Clause)

#### **4.23 VAAR 852.236-88 CONTRACT CHANGES--SUPPLEMENT (JUL 2002)**

(a) Paragraphs (a)(1) through (a)(4) apply to proposed contract changes costing over \$500,000.

(1) When requested by the contracting officer, the contractor shall submit proposals for changes in work to the resident engineer. Proposals, to be submitted as expeditiously as possible but within 30 calendar days after receipt of request, shall be in legible form, original and two copies, with an itemized breakdown that will include material, quantities, unit prices, labor costs (separated into trades), construction equipment, etc. (Labor costs are to be identified with specific material placed or operation performed.) The contractor must obtain and furnish with a proposal an itemized breakdown as described above, signed by each subcontractor participating in the change regardless of tier. When certified cost or pricing data are required under FAR Subpart 15.403, the cost or pricing data shall be submitted in accordance with FAR 15.403-5.

(2) When the necessity to proceed with a change does not allow sufficient time to negotiate a modification or because of failure to reach an agreement, the contracting officer may issue a change order instructing the contractor to proceed on the basis of a tentative price based on the best estimate available at the time, with the firm price to be determined

later. Furthermore, when the change order is issued, the contractor shall submit a proposal, which includes the information required by paragraph (a)(1), for cost of changes in work within 30 calendar days.

(3) The contracting officer will consider issuing a settlement by determination to the contract if the contractor's proposal required by paragraphs (a)(1) or (a)(2) of this clause is not received within 30 calendar days or if agreement has not been reached.

(4) Bond premium adjustment, consequent upon changes ordered, will be made as elsewhere specified at the time of final settlement under the contract and will not be included in the individual change.

(b) Paragraphs (b)(1) through (b)(11) apply to proposed contract changes costing \$500,000 or less:

(1) When requested by the contracting officer, the contractor shall submit proposals for changes in work to the resident engineer. Proposals, to be submitted as expeditiously as possible but within 30 calendar days after receipt of request, shall be in legible form, original and two copies, with an itemized breakdown that will include material, quantities, unit prices, labor costs (separated into trades), construction equipment, etc. (Labor costs are to be identified with specific material placed or operation performed.) The contractor must obtain and furnish with a proposal an itemized breakdown as described above, signed by each subcontractor participating in the change regardless of tier. When certified cost or pricing data or information other than cost or pricing data are required under FAR 15.403, the data shall be submitted in accordance with FAR 15.403-5. No itemized breakdown will be required for proposals amounting to less than \$1,000.

(2) When the necessity to proceed with a change does not allow sufficient time to negotiate a modification or because of failure to reach an agreement, the contracting officer may issue a change order instructing the contractor to proceed on the basis of a tentative price based on the best estimate available at the time, with the firm price to be determined later. Furthermore, when the change order is issued, the contractor shall submit within 30 calendar days, a proposal that includes the information required by paragraph (b)(1) for the cost of the changes in work.

(3) The contracting officer will consider issuing a settlement by determination to the contract if the contractor's proposal required by paragraphs (b)(1) or (b)(2) of this clause is not received within 30 calendar days, or if agreement has not been reached.

(4) Allowances not to exceed 10 percent each for overhead and profit for the party performing the work will be based on the value of labor, material, and use of construction equipment required to accomplish the change. As the value of the change increases, a declining scale will be used in negotiating the percentage of overhead and profit. Allowable percentages on changes will not exceed the following: 10 percent overhead and 10 percent profit on the first \$20,000; 7-1/2 percent overhead and 7-1/2 percent profit on the next \$30,000; 5 percent overhead and 5 percent profit on balance over \$50,000. Profit shall be computed by multiplying the profit percentage by the sum of the direct costs and computed overhead costs.

(5) The prime contractor's or upper-tier subcontractor's fee on work performed by lower-tier subcontractors will be based on the net increased cost to the prime contractor or upper-tier subcontractor, as applicable. Allowable fee on changes will not exceed the following: 10 percent fee on the first \$20,000; 7-1/2 percent fee on the next \$30,000; and 5 percent fee on balance over \$50,000.

(6) Not more than four percentages, none of which exceed the percentages shown above, will be allowed regardless of the number of tiers of subcontractors.

(7) Where the contractor's or subcontractor's portion of a change involves credit items, such items must be deducted prior to adding overhead and profit for the party performing the work. The contractor's fee is limited to the net increase to contractor of subcontractors' portions cost computed in accordance herewith.

(8) Where a change involves credit items only, a proper measure of the amount of downward adjustment in the contract price is the reasonable cost to the contractor if he/she had performed the deleted work. A reasonable allowance for overhead and profit are properly includable as part of the downward adjustment for a deductive change. The amount of such allowance is subject to negotiation.

(9) Cost of Federal Old Age Benefit (Social Security) tax and of Worker's Compensation and Public Liability insurance appertaining to changes are allowable. While no percentage will be allowed thereon for overhead or profit, prime contractor's fee will be allowed on such items in subcontractors' proposals.

(10) Overhead and contractor's fee percentages shall be considered to include insurance other than mentioned herein, field and office supervisors and assistants, security police, use of small tools, incidental job burdens, and general home office expenses and no separate allowance will be made therefore. Assistants to office supervisors include all clerical, stenographic and general office help. Incidental job burdens include, but are not necessarily limited to, office equipment and supplies, temporary toilets, telephone and conformance to OSHA requirements. Items such as, but not necessarily limited to, review and coordination, estimating and expediting relative to contract changes are associated with field and office supervision and are considered to be included in the contractor's overhead and/or fee percentage.

(11) Bond premium adjustment, consequent upon changes ordered, will be made as elsewhere specified at the time of final settlement under the contract and will not be included in the individual change.

(End of Clause)

#### **4.24 VAAR 852.236-89 BUY AMERICAN ACT (JAN 2008)**

(a) Reference is made to the clause entitled "Buy American Act--Construction Materials," FAR 52.225-9.

(b) Notwithstanding a bidder's right to offer identifiable foreign construction material in its bid pursuant to FAR 52.225-9, VA does not anticipate accepting an offer that includes foreign construction material.

(c) If a bidder chooses to submit a bid that includes foreign construction material, that bidder must provide a listing of the specific foreign construction material he/she intends to use and a price for said material. Bidders must include bid prices for comparable domestic construction material. If VA determines not to accept foreign construction material and no comparable domestic construction material is provided, the entire bid will be rejected.

(d) Any foreign construction material proposed after award will be rejected unless the bidder proves to VA's satisfaction: (1) it was impossible to request the exemption prior to award, and (2) said domestic construction material is no longer available, or (3) where the price has escalated so dramatically after the contract has been awarded that it would be unconscionable to require performance at that price. The determinations required by (1), (2), and (3) of this paragraph shall be made in accordance with Subpart 825.2 and FAR 25.2.

(e) By signing this bid, the bidder declares that all articles, materials and supplies for use on the project shall be domestic unless specifically set forth on the Bid Form or addendum thereto.

(End of Clause)

#### **4.25 VAAR 852.236-91 SPECIAL NOTES (JUL 2002)**

(a) Signing of the bid shall be deemed to be a representation by the bidder that:

(1) Bidder is a construction contractor who owns, operates, or maintains a place of business, regularly engaged in construction, alteration, or repair of buildings, structures, and communications facilities, or other engineering projects, including furnishing and installing of necessary equipment; or

(2) If newly entering into a construction activity, bidder has made all necessary arrangements for personnel, construction equipment, and required licenses to perform construction work; and

(3) Upon request, prior to award, bidder will promptly furnish to the Government a statement of facts in detail as to bidder's previous experience (including recent and current contracts), organization (including company officers), technical qualifications, financial resources and facilities available to perform the contemplated work.

(b) Unless otherwise provided in this contract, where the use of optional materials or construction is permitted, the same standard of workmanship, fabrication and installation shall be required irrespective of which option is selected. The contractor shall make any change or adjustment in connecting work or otherwise necessitated by the use of such optional material or construction, without additional cost to the Government.

(c) When approval is given for a system component having functional or physical characteristics different from those indicated or specified, it is the responsibility of the contractor to furnish and install related components with characteristics and capacities compatible with the approved substitute component as required for systems to function as noted on drawings and specifications. There shall be no additional cost to the Government.

(d) In some instances it may have been impracticable to detail all items in specifications or on drawings because of variances in manufacturers' methods of achieving specified results. In such instances the contractor will be required to furnish all labor, materials, drawings, services and connections necessary to produce systems or equipment which are completely installed, functional, and ready for operation by facility personnel in accordance with their intended use.

(e) Claims by the contractor for delay attributed to unusually severe weather must be supported by climatological data covering the period and the same period for the 10 preceding years. When the weather in question exceeds in intensity or frequency the 10-year average, the excess experienced shall be considered "unusually severe." Comparison shall be on a monthly basis. Whether or not unusually severe weather in fact delays the work will depend upon the effect of weather on the branches of work being performed during the time under consideration.

(End of Clause)

#### **4.26 VAAR 852.246-74 SPECIAL WARRANTIES (JAN 2008)**

The clause entitled "Warranty of Construction" in FAR 52.246-21 is supplemented as follows:

Any special warranties that may be required under the contract shall be subject to the elections set forth in the FAR clause at 52.246-21, Warranty of Construction, unless otherwise provided for in such special warranties.

(End of Clause)

#### **4.27 VAAR 852.273-76 ELECTRONIC INVOICE SUBMISSION (Interim - October 2008)**

(a) To improve the timeliness of payments and lower overall administrative costs, VA strongly encourages contractors to submit invoices using its electronic invoicing system. At present, electronic submission is voluntary and any nominal

registration fees will be the responsibility of the contractor. VA intends to mandate electronic invoice submission, subject to completion of the federal rulemaking process. At present, VA is using a 3rd party agent to contact contractors regarding this service. During the voluntary period, contractors interested in registering for the electronic system should contact the VA's Financial Services Center at <http://www.fsc.va.gov/einvoice.asp>.

(End of Clause)

#### **4.28 52.252-2 CLAUSES INCORPORATED BY REFERENCE (FEB 1998)**

This contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. Also, the full text of a clause may be accessed electronically at this/these address(es):

<http://www.acquisition.gov/far/index.html>

<http://www.va.gov/oamm/oa/ars/policyreg/vaar/index.cfm>

(End of Clause)

<b><u>FAR Number</u></b>	<b><u>Title</u></b>	<b><u>Date</u></b>
52.203-15	WHISTLEBLOWER PROTECTIONS UNDER THE AMERICAN RECOVERY AND REINVESTMENT ACT OF 2009	JUN 2010
52.204-10	REPORTING EXECUTIVE COMPENSATION AND FIRST-TIER SUBCONTRACT AWARDS	AUG 2012
52.204-11	AMERICAN RECOVERY AND REINVESTMENT ACT-- REPORTING REQUIREMENTS	JUL 2011
52.209-6	PROTECTING THE GOVERNMENT'S INTEREST WHEN SUBCONTRACTING WITH CONTRACTORS DEBARRED, SUSPENDED, OR PROPOSED FOR DEBARMENT	DEC 2010
52.211-6	BRAND NAME OR EQUAL	AUG 1999
52.214-26	AUDIT AND RECORDS--SEALED BIDDING ALTERNATE I (MAR 2009)	OCT 2010
52.222-3	CONVICT LABOR	JUN 2003
52.222-6	DAVIS-BACON ACT	JUL 2005
52.222-7	WITHHOLDING OF FUNDS	FEB 1988
52.222-8	PAYROLLS AND BASIC RECORDS	JUN 2010
52.222-9	APPRENTICES AND TRAINEES	JUL 2005
52.222-10	COMPLIANCE WITH COPELAND ACT REQUIREMENTS	FEB 1988
52.222-11	SUBCONTRACTS (LABOR STANDARDS)	JUL 2005
52.222-12	CONTRACT TERMINATION - DEBARMENT	FEB 1988
52.222-13	COMPLIANCE WITH DAVIS-BACON AND RELATED ACT REGULATIONS	FEB 1988
52.222-14	DISPUTES CONCERNING LABOR STANDARDS	FEB 1988
52.222-15	CERTIFICATION OF ELIGIBILITY	FEB 1988
52.222-21	PROHIBITION OF SEGREGATED FACILITIES	FEB 1999
52.222-26	EQUAL OPPORTUNITY	MAR 2007
52.222-27	AFFIRMATIVE ACTION COMPLIANCE REQUIREMENTS FOR CONSTRUCTION	FEB 1999

52.222-35	EQUAL OPPORTUNITY FOR VETERANS	SEP 2010
52.222-36	AFFIRMATIVE ACTION FOR WORKERS WITH DISABILITIES	OCT 2010
52.222-37	EMPLOYMENT REPORTS ON VETERANS	SEP 2010
52.222-50	COMBATING TRAFFICKING IN PERSONS	FEB 2009
52.223-5	POLLUTION PREVENTION AND RIGHT-TO-KNOW INFORMATION ALTERNATE I (MAY 2011)	MAY 2011
52.223-18	ENCOURAGING CONTRACTOR POLICIES TO BAN TEXT MESSAGING WHILE DRIVING	AUG 2011
52.225-13	RESTRICTIONS ON CERTAIN FOREIGN PURCHASES	JUN 2008
52.227-4	PATENT INDEMNITY--CONSTRUCTION CONTRACTS	DEC 2007
52.228-2	ADDITIONAL BOND SECURITY	OCT 1997
52.228-11	PLEDGES OF ASSETS	JAN 2012
52.228-12	PROSPECTIVE SUBCONTRACTOR REQUESTS FOR BONDS	OCT 1995
52.228-14	IRREVOCABLE LETTER OF CREDIT	DEC 1999
52.232-5	PAYMENTS UNDER FIXED-PRICE CONSTRUCTION CONTRACTS	SEP 2002
52.232-23	ASSIGNMENT OF CLAIMS	JAN 1986
52.232-27	PROMPT PAYMENT FOR CONSTRUCTION CONTRACTS	OCT 2008
52.232-34	PAYMENT BY ELECTRONIC FUNDS TRANSFER-- OTHER THAN CENTRAL CONTRACTOR REGISTRATION	MAY 1999
52.232-38	SUBMISSION OF ELECTRONIC FUNDS TRANSFER INFORMATION WITH OFFER	MAY 1999
52.233-1	DISPUTES	JUL 2002
52.233-3	PROTEST AFTER AWARD	AUG 1996
52.233-4	APPLICABLE LAW FOR BREACH OF CONTRACT CLAIM	OCT 2004
52.236-2	DIFFERING SITE CONDITIONS	APR 1984
52.236-3	SITE INVESTIGATION AND CONDITIONS AFFECTING THE WORK	APR 1984
52.236-5	MATERIAL AND WORKMANSHIP	APR 1984
52.236-6	SUPERINTENDENCE BY THE CONTRACTOR	APR 1984
52.236-7	PERMITS AND RESPONSIBILITIES	NOV 1991
52.236-8	OTHER CONTRACTS	APR 1984
52.236-9	PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS	APR 1984
52.236-10	OPERATIONS AND STORAGE AREAS	APR 1984
52.236-11	USE AND POSSESSION PRIOR TO COMPLETION	APR 1984
52.236-12	CLEANING UP	APR 1984
52.236-13	ACCIDENT PREVENTION	NOV 1991
52.236-14	AVAILABILITY AND USE OF UTILITY SERVICES	APR 1984
52.236-17	LAYOUT OF WORK	APR 1984
52.236-26	PRECONSTRUCTION CONFERENCE	FEB 1995
52.242-14	SUSPENSION OF WORK	APR 1984
52.244-6	SUBCONTRACTS FOR COMMERCIAL ITEMS	DEC 2010
52.246-12	INSPECTION OF CONSTRUCTION	AUG 1996
52.246-21	WARRANTY OF CONSTRUCTION ALTERNATE I (APR 1984)	MAR 1994
52.249-10	DEFAULT (FIXED-PRICE CONSTRUCTION)	APR 1984
52.253-1	COMPUTER GENERATED FORMS	JAN 1991



## 4.29 Wage Rates

General Decision Number: OK120092 09/14/2012 OK92

State: Oklahoma

Construction Type: Building

Building Construction -does not include residential construction consisting of single family homes and apartments up to and including 4 stories. (Including building projects on industrial sites and treatment plants)

County: Muskogee County in Oklahoma.

Modification Number	Publication Date
0	09/14/2012

BOIL0592-001 01/01/2012

	Rates	Fringes
BOILERMAKER.....	\$ 23.47	19.87

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ELEV0083-003 01/01/2012

	Rates	Fringes
ELEVATOR MECHANIC.....	\$ 35.85	23.535

PAID HOLIDAYS:

a. New Year's Day, Memorial Day, Independence Day, Labor Day, Veterans' Day, Thanksgiving Day, the Friday after Thanksgiving, and Christmas Day.

b. Employer contributes 8% of regular hourly rate to vacation pay credit for employee who has worked in business more than 5 years; 6% for less than 5 years' service.

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ENGI0627-012 06/01/2012

	Rates	Fringes
POWER EQUIPMENT OPERATOR:		
Group 1.....	\$ 25.25	10.87
Group 2.....	\$ 24.35	10.87
Group 3.....	\$ 23.80	10.87
Group 4.....	\$ 23.20	10.87
Group 5.....	\$ 22.70	10.87
Group 8.....	\$ 20.45	10.87
Group10.....	\$ 19.45	10.87

## POWER EQUIPMENT OPERATOR

GROUP 1: CRANES with Boom Incl. Jib 300 ft and over or 150  
Tons and over

GROUP 2: CRANES with Boom Incl. Jib 200 ft <300 ft or 100  
Tons and over

GROUP 3: CRANES with Boom Incl. Jib 100 ft < 200 ft, All  
Tower Cranes, Cranes 3 cu. Yd. & over

GROUP 4: CRANES with Boom Incl. Jib less than 100 ft and less than  
3 cu. Yd.; Overhead Monorail Crane

GROUP 5: BULLDOZER

GROUP 8: FORK-LIFT

GROUP 10: OILER

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IRON0584-010 06/01/2012

	Rates	Fringes
IRONWORKER, STRUCTURAL.....	\$ 22.70	12.28

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PLUM0430-022 07/01/2011

	Rates	Fringes
PIPEFITTER (Including HVAC Pipe and Unit Installation).....	\$ 27.75	11.38

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SHEE0270-009 06/01/2012

	Rates	Fringes
SHEET METAL WORKER (Including HVAC Duct Installation).....	\$ 30.56	11.52

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SUOK2012-041 06/18/2012

	Rates	Fringes
BRICKLAYER.....	\$ 20.00	0.00
CARPENTER.....	\$ 13.62	0.00
CAULKER.....	\$ 20.00	1.61
CEMENT MASON/CONCRETE FINISHER...	\$ 16.91	0.61
ELECTRICIAN (Alarm Installation).....	\$ 20.47	4.52
ELECTRICIAN (Low Voltage Wiring).....	\$ 21.03	4.94
ELECTRICIAN (Sound and Communications Systems Installation).....	\$ 22.10	5.76

ELECTRICIAN: Excludes Low Voltage Wiring and Installation of Alarms and Sound and Communication Systems.....	\$ 23.04	5.52
LABORER: Common or General.....	\$ 9.22	0.00
LABORER: Mason Tender - Brick...	\$ 10.25	0.00
LABORER: Mason Tender - Cement/Concrete.....	\$ 13.04	0.00
LABORER: Pipelayer.....	\$ 12.93	0.00
OPERATOR: Backhoe/Excavator/Trackhoe.....	\$ 13.00	0.00
PAINTER: Brush, Roller and Spray.....	\$ 13.56	0.00
PLUMBER, Excludes HVAC Pipe Installation.....	\$ 24.66	10.36
ROOFER.....	\$ 15.00	0.29
SPRINKLER FITTER (Fire Sprinklers).....	\$ 39.95	0.38

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WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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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)).

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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 union or non-union.

#### Union Identifiers

An identifier enclosed in dotted lines beginning with characters other than "SU" denotes that the union classification and rate have found to be prevailing for that classification. Example:  
 PLUM0198-005 07/01/2011. The

first four letters , PLUM, indicate the international union and the four-digit number, 0198, that follows 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. The date, 07/01/2011, following these characters is the effective date of the most current negotiated rate/collective bargaining agreement which would be July 1, 2011 in the above example.

Union prevailing wage rates will be updated to reflect any changes in the collective bargaining agreements governing the rate.

#### Non-Union Identifiers

Classifications listed under an "SU" identifier were derived from survey data by computing average rates and are not union rates; however, the data used in computing these rates may include both union and non-union data. Example: SULA2004-007 5/13/2010. SU indicates the rates are not union rates, LA indicates the State of Louisiana; 2004 is the year of the survey; and 007 is an internal number used in producing the wage determination. A 1993 or later date, 5/13/2010, indicates the classifications and rates under that identifier were issued as a General Wage Determination on that date.

Survey wage rates will remain in effect and will not change until a new survey is conducted.

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#### 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.

===== END

OF GENERAL DECISION

## 4.30 Specifications

### SECTION 01 00 00

#### GENERAL REQUIREMENTS

##### 1.1 GENERAL INTENTION

- A. Contractor shall completely prepare site for building operations, including demolition and removal of existing structures, and furnish labor and materials and perform work for Project 623-13-103 Commission Surgery HVAC Systems as required by specifications and Statement of Work and shown on as-built construction drawings.
- B. Visits to the site by Bidders may be made only by appointment with the Medical Center Engineering Officer.
- C. All employees of general contractor and subcontractors shall comply with VA security management program and obtain permission of the VA police, be identified by project and employer, and restricted from unauthorized access.
- D. Prior to commencing work, general contractor shall provide proof that a OSHA certified "competent person" (CP) (29 CFR 1926.20(b)(2) will maintain a presence at the work site whenever the general or subcontractors are present.
- E. Training:

1. All employees of general contractor or subcontractors shall have the 10-hour OSHA certified Construction Safety course and /or other relevant competency training, as determined by VA CP with input from the ICRA team.
2. Submit training records of all such employees for approval before the start of work.

#### **1.2 STATEMENT OF BID ITEM(S)**

- A. ITEM I, Work includes alterations, mechanical, controls, and electrical work to complete Project 623-13-103 Commission Surgery HVAC Systems as defined in the Statement of Work and specifications and as shown on the as-built contract drawings.

#### **1.3 SPECIFICATIONS AND DRAWINGS FOR CONTRACTOR**

- A. AFTER AWARD OF CONTRACT, 1 set of specifications and drawings will be furnished.
- B. Additional sets of drawings may be made by the Contractor, at Contractor's expense.

#### **1.4 CONSTRUCTION SECURITY REQUIREMENTS**

##### **A. Security Plan:**

1. The security plan defines both physical and administrative security procedures that will remain effective for the entire duration of the project.
2. The General Contractor is responsible for assuring that all sub-contractors working on the project and their employees also comply with these regulations.

##### **B. Security Procedures:**

1. General Contractor's employees shall not enter the project site without appropriate badge. They may also be subject to inspection of their personal effects when entering or leaving the project site.
2. For working outside the "regular hours" as defined in the contract, The General Contractor shall give 3 days notice to the Contracting Officer so that security arrangements can be provided for the employees. This notice is separate from any notices required for utility shutdown described later in this section.
3. No photography of VA premises is allowed without written permission of the Contracting Officer.
4. VA reserves the right to close down or shut down the project site and order General Contractor's employees off the premises in the event of a national

emergency. The General Contractor may return to the site only with the written approval of the Contracting Officer.

C. Key Control:

1. The General Contractor shall provide duplicate keys and lock combinations to the COTR for the purpose of security inspections of every area of project including tool boxes and parked machines and take any emergency action.
2. The General Contractor shall turn over all permanent lock cylinders to the VA locksmith for permanent installation. See Section 08 71 00, DOOR HARDWARE and coordinate.

D. Motor Vehicle Restrictions

1. Vehicle authorization request shall be required for any vehicle entering the site and such request shall be submitted 24 hours before the date and time of access. Access shall be restricted to picking up and dropping off materials and supplies.
2. Separate permits shall be issued for General Contractor and its employees for parking in designated areas only.

**1.5 FIRE SAFETY**

A. Applicable Publications: Publications listed below form part of this Article to extent referenced. Publications are referenced in text by basic designations only.

1. American Society for Testing and Materials (ASTM):

E84-2008.....Surface Burning Characteristics of Building Materials

2. National Fire Protection Association (NFPA):

10-2006.....Standard for Portable Fire Extinguishers

30-2007.....Flammable and Combustible Liquids Code

51B-2003.....Standard for Fire Prevention During Welding, Cutting and  
Other Hot Work

70-2007.....National Electrical Code

241-2004.....Standard for Safeguarding Construction, Alteration, and  
Demolition Operations



### 3. Occupational Safety and Health Administration (OSHA):

29 CFR 1926.....Safety and Health Regulations for Construction

- B. Fire Safety Plan: Establish and maintain a fire protection program in accordance with 29 CFR 1926. Prior to start of work, prepare a plan detailing project-specific fire safety measures, including periodic status reports, and submit to COTR for review for compliance. Prior to any worker for the contractor or subcontractors beginning work, they shall undergo a safety briefing provided by the general contractor's competent person per OSHA requirements. This briefing shall include information on the construction limits, VAMC safety guidelines, means of egress, break areas, work hours, locations of restrooms, use of VAMC equipment, etc. Documentation shall be provided to the COTR that individuals have undergone contractor's safety briefing.
- C. Site and Building Access: Maintain free and unobstructed access to facility emergency services and for fire, police and other emergency response forces in accordance with NFPA 241.
- D. Separate temporary facilities, such as trailers, storage sheds, and dumpsters, from existing buildings and new construction by distances in accordance with NFPA 241. For small facilities with less than 6 m (20 feet) exposing overall length, separate by 3m (10 feet).
- E. Temporary Construction Partitions:
  - 1. Install and maintain temporary construction partitions to provide smoke-tight separations between construction areas and adjoining areas. Construct partitions of gypsum board or treated plywood (flame spread rating of 25 or less in accordance with ASTM E84) on both sides of fire retardant treated wood or metal steel studs. Extend the partitions through suspended ceilings to floor slab deck or roof. Seal joints and penetrations. At door openings, install Class C, ¾ hour fire/smoke rated doors with self-closing devices.
  - 2. Install temporary construction partitions as shown on drawings to maintain integrity of existing exit stair enclosures, exit passageways, fire-rated enclosures of hazardous areas, horizontal exits, smoke barriers, vertical shafts and openings enclosures.
  - 3. Close openings in smoke barriers and fire-rated construction to maintain fire ratings. Seal penetrations with listed through-penetration firestop materials in accordance with Section 07 84 00, FIRESTOPPING.

- F. Temporary Heating and Electrical: Install, use and maintain installations in accordance with 29 CFR 1926, NFPA 241 and NFPA 70.
- G. Means of Egress: Do not block exiting for occupied buildings, including paths from exits to roads. Minimize disruptions and coordinate with COTR.
- H. Egress Routes for Construction Workers: Maintain free and unobstructed egress. Inspect daily. Report findings and corrective actions weekly to COTR.
- I. Fire Extinguishers: Provide and maintain extinguishers in construction areas and temporary storage areas in accordance with 29 CFR 1926, NFPA 241 and NFPA 10.
- J. Flammable and Combustible Liquids: Store, dispense and use liquids in accordance with 29 CFR 1926, NFPA 241 and NFPA 30.
- K. Sprinklers: Install, test and activate new automatic sprinklers prior to removing existing sprinklers.
- L. Existing Fire Protection: Do not impair automatic sprinklers, smoke and heat detection, and fire alarm systems, except for portions immediately under construction, and temporarily for connections. Provide fire watch for impairments more than 4 hours in a 24-hour period. Request interruptions in accordance with Article, OPERATIONS AND STORAGE AREAS, and coordinate with COTR. All existing or temporary fire protection systems (fire alarms, sprinklers) located in construction areas shall be tested as coordinated with the medical center. Parameters for the testing and results of any tests performed shall be recorded by the medical center and copies provided to the COTR.
- M. Smoke Detectors: Prevent accidental operation. Remove temporary covers at end of work operations each day. Coordinate with COTR.
- N. Hot Work: Perform and safeguard hot work operations in accordance with NFPA 241 and NFPA 51B. Coordinate with COTR. Obtain permits from COTR at least 1 hour in advance.
- O. Fire Hazard Prevention and Safety Inspections: Inspect entire construction areas weekly. Coordinate with, and report findings and corrective actions weekly to COTR.
- P. Smoking: Smoking is prohibited in and adjacent to construction areas inside existing buildings and additions under construction. In separate and detached buildings under construction, smoking is prohibited except in designated smoking rest areas.
- Q. Dispose of waste and debris in accordance with NFPA 241. Remove from buildings daily.

- R. Perform other construction, alteration and demolition operations in accordance with 29 CFR 1926.

#### **1.6 OPERATIONS AND STORAGE AREAS**

- A. The Contractor shall confine all operations (including storage of materials) on Government premises to areas authorized or approved by the Contracting Officer. The Contractor shall hold and save the Government, its officers and agents, free and harmless from liability of any nature occasioned by the Contractor's performance.
- B. Temporary buildings (e.g., storage sheds, shops, offices) and utilities may be erected by the Contractor only with the approval of the Contracting Officer and shall be built with labor and materials furnished by the Contractor without expense to the Government. The temporary buildings and utilities shall remain the property of the Contractor and shall be removed by the Contractor at its expense upon completion of the work. With the written consent of the Contracting Officer, the buildings and utilities may be abandoned and need not be removed.
- C. The Contractor shall, under regulations prescribed by the Contracting Officer, use only established roadways, or use temporary roadways constructed by the Contractor when and as authorized by the Contracting Officer. When materials are transported in prosecuting the work, vehicles shall not be loaded beyond the loading capacity recommended by the manufacturer of the vehicle or prescribed by any Federal, State, or local law or regulation. When it is necessary to cross curbs or sidewalks, the Contractor shall protect them from damage. The Contractor shall repair or pay for the repair of any damaged curbs, sidewalks, or roads.
- D. Working space and space available for storing materials shall be as determined by the COTR.
- E. Workmen are subject to rules of Medical Center applicable to their conduct.
- F. Execute work so as to interfere as little as possible with normal functioning of Medical Center as a whole, including operations of utility services, fire protection systems and any existing equipment, and with work being done by others. Use of equipment and tools that transmit vibrations and noises through the building structure, are not permitted in buildings that are occupied, during construction, jointly by patients or medical personnel, and Contractor's personnel, except as permitted by COTR where required by limited working space.
1. Do not store materials and equipment in other than assigned areas.
  2. Schedule delivery of materials and equipment to immediate construction working areas within buildings in use by Department of Veterans Affairs in quantities

sufficient for not more than two work days. Provide unobstructed access to Medical Center areas required to remain in operation.

3. Where access by Medical Center personnel to vacated portions of buildings is not required, storage of Contractor's materials and equipment will be permitted subject to fire and safety requirements.

G. Phasing: To insure such executions, Contractor shall furnish the COTR with a schedule of approximate dates on which the Contractor intends to accomplish work in each specific area of site, building or portion thereof. In addition, Contractor shall notify the COTR two weeks in advance of the proposed date of starting work in each specific area of site, building or portion thereof. Arrange such dates to insure accomplishment of this work in successive phases mutually agreeable to COTR and Contractor.

H. Buildings will be occupied during performance of work. Contractor shall take all measures and provide all material necessary for protecting existing equipment and property in affected areas of construction against dust and debris, so that equipment and affected areas to be used in the Medical Centers operations will not be hindered. Contractor shall permit access to Department of Veterans Affairs personnel and patients through other construction areas which serve as routes of access to such affected areas and equipment. Coordinate alteration work in areas occupied by Department of Veterans Affairs so that Medical Center operations will continue during the construction period.

I. When a building area is turned over to Contractor, Contractor shall accept entire responsibility therefore.

1. Contractor shall maintain a minimum temperature of 4 degrees C (40 degrees F) at all times, except as otherwise specified.
2. Contractor shall maintain in operating condition existing fire protection and alarm equipment. In connection with fire alarm equipment, Contractor shall make arrangements for pre-inspection of site with Fire Department or Company (Department of Veterans Affairs or municipal) whichever will be required to respond to an alarm from Contractor's employee or watchman.

J. Utilities Services: Maintain existing utility services for Medical Center at all times. Provide temporary facilities, labor, materials, equipment, connections, and utilities to assure uninterrupted services. Where necessary to cut existing water, steam, gases, sewer or air pipes, or conduits, wires, cables, etc. of utility services or of fire protection systems and communications systems (including

telephone), they shall be cut and capped at suitable places where shown; or, in absence of such indication, where directed by COTR.

1. No utility service such as water, gas, steam, sewers or electricity, or fire protection systems and communications systems may be interrupted without prior approval of COTR. Electrical work shall be accomplished with all affected circuits or equipment de-energized. When an electrical outage cannot be accomplished, work on any energized circuits or equipment shall not commence without the Medical Center Director's prior knowledge and written approval. Refer to specification Sections 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS, 27 05 11 REQUIREMENTS FOR COMMUNICATIONS INSTALLATIONS and 28 05 11, REQUIREMENTS FOR ELECTRONIC SAFETY AND SECURITY INSTALLATIONS for additional requirements.
  2. Contractor shall submit a request to interrupt any such services to COTR, in writing, 48 hours in advance of proposed interruption. Request shall state reason, date, exact time of, and approximate duration of such interruption.
  3. Contractor will be advised (in writing) of approval of request, or of which other date and/or time such interruption will cause least inconvenience to operations of Medical Center. Interruption time approved by Medical Center may occur at other than Contractor's normal working hours.
  4. Major interruptions of any system must be requested, in writing, at least 15 calendar days prior to the desired time and shall be performed as directed by the COTR.
  5. In case of a contract construction emergency, service will be interrupted on approval of COTR. Such approval will be confirmed in writing as soon as practical.
  6. Whenever it is required that a connection fee be paid to a public utility provider for new permanent service to the construction project, for such items as water, sewer, electricity, gas or steam, payment of such fee shall be the responsibility of the Government and not the Contractor.
- K. Abandoned Lines: All service lines such as wires, cables, conduits, ducts, pipes and the like, and their hangers or supports, which are to be abandoned but are not required to be entirely removed, shall be sealed, capped or plugged. The lines shall not be capped in finished areas, but shall be removed and sealed, capped or plugged in ceilings, within furred spaces, in unfinished areas, or within walls or partitions; so that they are completely behind the finished surfaces.

- L. To minimize interference of construction activities with flow of Medical Center traffic, comply with the following:
  - 1. Keep roads, walks and entrances to grounds, to parking and to occupied areas of buildings clear of construction materials, debris and standing construction equipment and vehicles.
  - 2. Method and scheduling of required cutting, altering and removal of existing roads, walks and entrances must be approved by the COTR.
- M. Coordinate the work for this contract with other construction operations as directed by COTR. This includes the scheduling of traffic and the use of roadways, as specified in Article, USE OF ROADWAYS.

#### **1.7 ALTERATIONS**

- A. Survey: Before any work is started, the Contractor shall make a thorough survey with the COTR of areas of buildings in which alterations occur and areas which are anticipated routes of access, and furnish a report, signed by both to the Contracting Officer. This report shall list by rooms and spaces:
  - 1. Existing condition and types of resilient flooring, doors, windows, walls and other surfaces not required to be altered throughout affected areas of buildings.
  - 2. Existence and conditions of items such as plumbing fixtures and accessories, electrical fixtures, equipment, venetian blinds, shades, etc., required by drawings to be either reused or relocated, or both.
  - 3. Shall note any discrepancies between drawings and existing conditions at site.
  - 4. Shall designate areas for working space, materials storage and routes of access to areas within buildings where alterations occur and which have been agreed upon by Contractor and COTR.
- B. Any items required by drawings to be either reused or relocated or both, found during this survey to be nonexistent, or in opinion of COTR to be in such condition that their use is impossible or impractical, shall be furnished and/or replaced by Contractor with new items in accordance with specifications which will be furnished by Government. Provided the contract work is changed by reason of this subparagraph B, the contract will be modified accordingly, under provisions of clause entitled "DIFFERING SITE CONDITIONS" (FAR 52.236-2) and "CHANGES" (FAR 52.243-4 and VAAR 852.236-88).

C. Re-Survey: Thirty days before expected partial or final inspection date, the Contractor and COTR together shall make a thorough re-survey of the areas of buildings involved. They shall furnish a report on conditions then existing, of resilient flooring, doors, windows, walls and other surfaces as compared with conditions of same as noted in first condition survey report:

1. Re-survey report shall also list any damage caused by Contractor to such flooring and other surfaces, despite protection measures; and, will form basis for determining extent of repair work required of Contractor to restore damage caused by Contractor's workmen in executing work of this contract.

D. Protection: Provide the following protective measures:

1. Wherever existing roof surfaces are disturbed they shall be protected against water infiltration. In case of leaks, they shall be repaired immediately upon discovery.
2. Temporary protection against damage for portions of existing structures and grounds where work is to be done, materials handled and equipment moved and/or relocated.
3. Protection of interior of existing structures at all times, from damage, dust and weather inclemency. Wherever work is performed, floor surfaces that are to remain in place shall be adequately protected prior to starting work, and this protection shall be maintained intact until all work in the area is completed.

#### **1.8 INFECTION PREVENTION MEASURES**

- A. Implement the requirements of VAMC's Infection Control Risk Assessment (ICRA) team. ICRA Group may monitor dust in the vicinity of the construction work and require the Contractor to take corrective action immediately if the safe levels are exceeded.
- B. Establish and maintain a dust control program as part of the contractor's infection preventive measures in accordance with the guidelines provided by ICRA Group. Prior to start of work, prepare a plan detailing project-specific dust protection measures, including periodic status reports, and submit to COTR for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES.
  1. All personnel involved in the construction or renovation activity shall be educated and trained in infection prevention measures established by the medical center.

- C. Medical Center Infection Control personnel shall monitor for airborne disease (e.g. aspergillosis) as appropriate during construction. A baseline of conditions may be established by the medical center prior to the start of work and periodically during the construction stage to determine impact of construction activities on indoor air quality. In addition:
1. The COTR and VAMC Infection Control personnel shall review pressure differential monitoring documentation to verify that pressure differentials in the construction zone and in the patient-care rooms are appropriate for their settings. The requirement for negative air pressure in the construction zone shall depend on the location and type of activity. Upon notification, the contractor shall implement corrective measures to restore proper pressure differentials as needed.
  2. In case of any problem, the medical center, along with assistance from the contractor, shall conduct an environmental assessment to find and eliminate the source.
- D. In general, following preventive measures shall be adopted during construction to keep down dust and prevent mold.
1. Dampen debris to keep down dust and provide temporary construction partitions in existing structures where directed by COTR. Blank off ducts and diffusers to prevent circulation of dust into occupied areas during construction.
  2. Do not perform dust producing tasks within occupied areas without the approval of the COTR. For construction in any areas that will remain jointly occupied by the medical Center and Contractor's workers, the Contractor shall:
    - a. Provide dust proof fire-rated temporary drywall construction barriers to completely separate construction from the operational areas of the hospital in order to contain dirt debris and dust. Barriers shall be sealed and made presentable on hospital occupied side. Install a self-closing rated door in a metal frame, commensurate with the partition, to allow worker access. Maintain negative air at all times. A fire retardant polystyrene, 6-mil thick or greater plastic barrier meeting local fire codes may be used where dust control is the only hazard, and an agreement is reached with the COTR and Medical Center.
    - b. HEPA filtration is required where the exhaust dust may reenter the breathing zone. Contractor shall verify that construction exhaust to exterior is not reintroduced to the medical center through intake vents, or building openings. Install HEPA (High Efficiency Particulate Accumulator) filter



vacuum system rated at 95% capture of 0.3 microns including pollen, mold spores and dust particles. Insure continuous negative air pressures occurring within the work area. HEPA filters should have ASHRAE 85 or other prefilter to extend the useful life of the HEPA. Provide both primary and secondary filtrations units. Exhaust hoses shall be heavy duty, flexible steel reinforced and exhausted so that dust is not reintroduced to the medical center.

- c. Adhesive Walk-off/Carpet Walk-off Mats, minimum 600mm x 900mm (24" x 36"), shall be used at all interior transitions from the construction area to occupied medical center area. These mats shall be changed as often as required to maintain clean work areas directly outside construction area at all times.
- d. Vacuum and wet mop all transition areas from construction to the occupied medical center at the end of each workday. Vacuum shall utilize HEPA filtration. Maintain surrounding area frequently. Remove debris as they are created. Transport these outside the construction area in containers with tightly fitting lids.
- e. The contractor shall not haul debris through patient-care areas without prior approval of the COTR and the Medical Center. When, approved, debris shall be hauled in enclosed dust proof containers or wrapped in plastic and sealed with duct tape. No sharp objects should be allowed to cut through the plastic. Wipe down the exterior of the containers with a damp rag to remove dust. All equipment, tools, material, etc. transported through occupied areas shall be made free from dust and moisture by vacuuming and wipe down.
- f. Using a HEPA vacuum, clean inside the barrier and vacuum ceiling tile prior to replacement. Any ceiling access panels opened for investigation beyond sealed areas shall be sealed immediately when unattended.
- g. There shall be no standing water during construction. This includes water in equipment drip pans and open containers within the construction areas. All accidental spills must be cleaned up and dried within 12 hours. Remove and dispose of porous materials that remain damp for more than 72 hours.
- h. At completion, remove construction barriers and ceiling protection carefully, outside of normal work hours. Vacuum and clean all surfaces free of dust after the removal.

E. Final Cleanup:

1. Upon completion of project, or as work progresses, remove all construction debris from above ceiling, vertical shafts and utility chases that have been part of the construction.
2. Perform HEPA vacuum cleaning of all surfaces in the construction area. This includes walls, ceilings, cabinets, furniture (built-in or free standing), partitions, flooring, etc.
3. All new air ducts shall be cleaned prior to final inspection.

#### **1.9 DISPOSAL AND RETENTION**

A. Materials and equipment accruing from work removed and from demolition of buildings or structures, or parts thereof, shall be disposed of as follows:

1. Reserved items which are to remain property of the Government are identified by attached tags or noted on drawings or in specifications as items to be stored. Items that remain property of the Government shall be removed or dislodged from present locations in such a manner as to prevent damage which would be detrimental to re-installation and reuse. Store such items where directed by COTR.
2. Items not reserved shall become property of the Contractor and be removed by Contractor from Medical Center.
3. Items of portable equipment and furnishings located in rooms and spaces in which work is to be done under this contract shall remain the property of the Government. When rooms and spaces are vacated by the Department of Veterans Affairs during the alteration period, such items which are NOT required by drawings and specifications to be either relocated or reused will be removed by the Government in advance of work to avoid interfering with Contractor's operation.

#### **1.10 PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS**

A. The Contractor shall preserve and protect all structures, equipment, and vegetation (such as trees, shrubs, and grass) on or adjacent to the work site, which are not to be removed and which do not unreasonably interfere with the work required under this contract. The Contractor shall only remove trees when specifically authorized to do so, and shall avoid damaging vegetation that will remain in place. If any limbs or branches of trees are broken during contract performance, or by the careless operation of equipment, or by workmen, the Contractor shall trim those

limbs or branches with a clean cut and paint the cut with a tree-pruning compound as directed by the Contracting Officer.

- B. The Contractor shall protect from damage all existing improvements and utilities at or near the work site and on adjacent property of a third party, the locations of which are made known to or should be known by the Contractor. The Contractor shall repair any damage to those facilities, including those that are the property of a third party, resulting from failure to comply with the requirements of this contract or failure to exercise reasonable care in performing the work. If the Contractor fails or refuses to repair the damage promptly, the Contracting Officer may have the necessary work performed and charge the cost to the Contractor.
- C. Refer to Section 01 57 19, TEMPORARY ENVIRONMENTAL CONTROLS, for additional requirements on protecting vegetation, soils and the environment. Refer to Articles, "Alterations", "Restoration", and "Operations and Storage Areas" for additional instructions concerning repair of damage to structures and site improvements.

#### **1.11 RESTORATION**

- A. Remove, cut, alter, replace, patch and repair existing work as necessary to install new work. Except as otherwise shown or specified, do not cut, alter or remove any structural work, and do not disturb any ducts, plumbing, steam, gas, or electric work without approval of the COTR. Existing work to be altered or extended and that is found to be defective in any way, shall be reported to the COTR before it is disturbed. Materials and workmanship used in restoring work, shall conform in type and quality to that of original existing construction, except as otherwise shown or specified.
- B. Upon completion of contract, deliver work complete and undamaged. Existing work (walls, ceilings, partitions, floors, mechanical and electrical work, lawns, paving, roads, walks, etc.) disturbed or removed as a result of performing required new work, shall be patched, repaired, reinstalled, or replaced with new work, and refinished and left in as good condition as existed before commencing work.
- C. At Contractor's own expense, Contractor shall immediately restore to service and repair any damage caused by Contractor's workmen to existing piping and conduits, wires, cables, etc., of utility services or of fire protection systems and communications systems (including telephone) which are indicated on drawings and which are not scheduled for discontinuance or abandonment.
- D. Expense of repairs to such utilities and systems not shown on drawings or locations of which are unknown will be covered by adjustment to contract time and price in

accordance with clause entitled "CHANGES" (FAR 52.243-4 and VAAR 852.236-88) and "DIFFERING SITE CONDITIONS" (FAR 52.236-2).

#### **1.12 AS-BUILT DRAWINGS**

- A. The contractor shall maintain two full size sets of as-built drawings which will be kept current during construction of the project, to include all contract changes, modifications and clarifications.
- B. All variations shall be shown in the same general detail as used in the contract drawings. To insure compliance, as-built drawings shall be made available for the COTR's review, as often as requested.
- C. Contractor shall deliver two approved completed sets of as-built drawings to the COTR within 15 calendar days after each completed phase and after the acceptance of the project by the COTR.
- D. Paragraphs A, B, & C shall also apply to all shop drawings.

#### **1.13 TEMPORARY USE OF EXISTING ELEVATORS**

- A. Use of existing elevators for handling building materials and Contractor's personnel will be permitted subject to following provisions:
  - 1. Contractor makes all arrangements with the COTR for use of elevators. The COTR will ascertain that elevators are in proper condition. Contractor may use elevator as directed by COTR.
  - 2. Contractor covers and provides maximum protection of following elevator components:
    - a. Entrance jambs, heads soffits and threshold plates.
    - b. Entrance columns, canopy, return panels and inside surfaces of car enclosure walls.
    - c. Finish flooring.

#### **1.14 TEMPORARY TOILETS**

- A. Contractor may have for use of Contractor's workmen, such toilet accommodations as may be assigned to Contractor by Medical Center. Contractor shall keep such places clean and be responsible for any damage done thereto by Contractor's workmen. Failure to maintain satisfactory condition in toilets will deprive Contractor of the privilege to use such toilets.

#### 1.15 AVAILABILITY AND USE OF UTILITY SERVICES

- A. The Government shall make all reasonably required amounts of utilities available to the Contractor from existing outlets and supplies, as specified in the contract. The Contractor shall carefully conserve any utilities furnished without charge.
- B. The Contractor, at Contractor's expense and in a workmanlike manner satisfactory to the Contracting Officer, shall install and maintain all necessary temporary connections and distribution lines required. Before final acceptance of the work by the Government, the Contractor shall remove all the temporary connections, distribution lines, meters, and associated paraphernalia.
- D. Heat: Furnish temporary heat necessary to prevent injury to work and materials through dampness and cold. Use of open salamanders or any temporary heating devices which may be fire hazards or may smoke and damage finished work, will not be permitted. Maintain minimum temperatures as specified for various materials:
  - 1. Obtain heat by connecting to Medical Center heating distribution system.
    - a. Steam is available at no cost to Contractor.
- E. Electricity (for Construction and Testing): Furnish all temporary electric services.
  - 1. Obtain electricity by connecting to the Medical Center electrical distribution system.
- F. Water (for Construction and Testing): Furnish temporary water service.
  - 1. Obtain water by connecting to the Medical Center water distribution system. Provide reduced pressure backflow preventer at each connection. Water is available at no cost to the Contractor.
  - 2. Maintain connections, pipe, fittings and fixtures and conserve water-use so none is wasted. Failure to stop leakage or other wastes will be cause for revocation (at COTR's discretion) of use of water from Medical Center's system.
- G. Steam: Furnish steam system for testing required in various sections of specifications.
  - 1. Obtain steam for testing by connecting to the Medical Center steam distribution system. Steam is available at no cost to the Contractor.

2. Maintain connections, pipe, fittings and fixtures and conserve steam-use so none is wasted. Failure to stop leakage or other waste will be cause for revocation (at COTR's discretion), of use of steam from the Medical Center's system.

#### **1.16 N/A**

#### **1.17 TESTS**

- A. Pre-test mechanical and electrical equipment and systems and make corrections required for proper operation of such systems before requesting final tests. Final test will not be conducted unless pre-tested.
- B. Conduct final tests required in various sections of specifications in presence of an authorized representative of the Contracting Officer. Contractor shall furnish all labor, materials, equipment, instruments, and forms, to conduct and record such tests.
- C. Mechanical and electrical systems shall be balanced, controlled and coordinated. A system is defined as the entire complex which must be coordinated to work together during normal operation to produce results for which the system is designed. For example, air conditioning supply air is only one part of entire system which provides comfort conditions for a building. Other related components are return air, exhaust air, steam, chilled water, refrigerant, hot water, controls and electricity, etc. Another example of a complex which involves several components of different disciplines is a boiler installation. Efficient and acceptable boiler operation depends upon the coordination and proper operation of fuel, combustion air, controls, steam, feedwater, condensate and other related components.
- D. All related components as defined above shall be functioning when any system component is tested. Tests shall be completed within a reasonably short period of time during which operating and environmental conditions remain reasonably constant.
- E. Individual test result of any component, where required, will only be accepted when submitted with the test results of related components and of the entire system.

#### **1.18 INSTRUCTIONS**

- A. Contractor shall furnish Maintenance and Operating manuals and verbal instructions when required by the various sections of the specifications and as hereinafter specified.
- B. Manuals: Maintenance and operating manuals (four copies each) for each separate piece of equipment shall be delivered to the COTR coincidental with the delivery of

the equipment to the job site. Manuals shall be complete, detailed guides for the maintenance and operation of equipment. They shall include complete information necessary for starting, adjusting, maintaining in continuous operation for long periods of time and dismantling and reassembling of the complete units and sub-assembly components. Manuals shall include an index covering all component parts clearly cross-referenced to diagrams and illustrations. Illustrations shall include "exploded" views showing and identifying each separate item. Emphasis shall be placed on the use of special tools and instruments. The function of each piece of equipment, component, accessory and control shall be clearly and thoroughly explained. All necessary precautions for the operation of the equipment and the reason for each precaution shall be clearly set forth. Manuals must reference the exact model, style and size of the piece of equipment and system being furnished. Manuals referencing equipment similar to but of a different model, style, and size than that furnished will not be accepted.

- C. Instructions: Contractor shall provide qualified, factory-trained manufacturers' representatives to give detailed instructions to assigned Department of Veterans Affairs personnel in the operation and complete maintenance for each piece of equipment. All such training will be at the job site. These requirements are more specifically detailed in the various technical sections. Instructions for different items of equipment that are component parts of a complete system, shall be given in an integrated, progressive manner. All instructors for every piece of component equipment in a system shall be available until instructions for all items included in the system have been completed. This is to assure proper instruction in the operation of inter-related systems. All instruction periods shall be at such times as scheduled by the COTR and shall be considered concluded only when the COTR is satisfied in regard to complete and thorough coverage. The Department of Veterans Affairs reserves the right to request the removal of, and substitution for, any instructor who, in the opinion of the COTR, does not demonstrate sufficient qualifications in accordance with requirements for instructors above.

#### **1.19 PHOTOGRAPHIC DOCUMENTATION**

- A. Provide digital camera to COTR for project documentation. Camera shall be Canon PowerShot A480 or approved equal compatible with approved IT interface at Medical Center. Camera shall remain property of Medical Center following contract...

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SECTION 00 01 15  
LIST OF DRAWING SHEETS

The drawings listed below accompanying this specification are mechanical and controls as-built drawings to be used at a minimum for reference in commissioning. Additional as-built drawings are available if needed as listed on the cover sheets for the respective project.

<u>Drawing No.</u>	<u>Title</u>
TS-1 Cover Page	Commission Surgery HVAC Systems
Project: Renovate Inpatient Pharmacy for USP 797	
COVER Sheet 1 of 21	Cover Sheet
M-1 Sheet 4 of 21	Partial 1 <sup>st</sup> Floor & Mezzanine-HVAC
M-2 Sheet 5 of 21	Partial Roof - HVAC Plan
MD-1 Sheet 6 of 21	Mechanical Details
MD-2 Sheet 7 of 21	Mechanical Details
MD-3 Sheet 8 of 21	Mechanical Schedules & Details
MD-4 Sheet 9 of 21	Mechanical Legend
MF-1 Sheet 10 of 21	Central Plant Chilled Water Flow Diagram
MF-2 Sheet 11 of 21	Condenser Water Flow Diagram
MC-1 Sheet 12 of 21	Chilled/Condenser Water Control
MC-2 Sheet 13 of 21	Sequence of Operation/Legend
Controls As-Built Drawings:	
2010A07 Drawing 1 of 3	Chiller Plant Temperature Controls
2010A07 Drawing 2 of 3	Chiller Plant Temperature Controls
2010A07 Drawing 3 of 3	Generator Controls
Project: Remodel Surgery Suite	
COVER Sheet 1 of 92	Cover Sheet
M-1 Sheet 32 of 92	Partial Penthouse HVAC Plan
M-2 Sheet 33 of 92	Partial Penthouse HVAC Plan
M-3 Sheet 34 of 92	Partial Penthouse HVAC Plan



M-4 Sheet 35 of 92	Partial Penthouse HVAC Plan
M-5 Sheet 36 of 92	Partial Penthouse HVAC Piping Plan
M-6 Sheet 37 of 92	Partial Penthouse HVAC Piping Plan
M-7 Sheet 38 of 92	Partial Third Floor HVAC Plan
M-8 Sheet 39 of 92	Partial Third Floor HVAC Plan
M-9 Sheet 40 of 92	Partial Third Floor HVAC Plan
M-10 Sheet 41 of 92	Partial Penthouse Roof Mechanical Plan
MC-1 Sheet 42 of 92	Surgery Air Handling Unit Control
MC-2 Sheet 43 of 92	Terminal Unit Control
MC-3 Sheet 44 of 92	Building Heating Water Control
MD-1 Sheet 45 of 92	Details
MD-2 Sheet 46 of 92	Details
MD-3 Sheet 47 of 92	Details
MF-2 Sheet 48 of 92	Bldg. 1 Chilled Water Flow Diagram
MS-1 Sheet 49 of 92	Schedules
MS-2 Sheet 50 of 92	Schedules/Legend
Controls As-Built Drawings:	
2010A13 Drawing 0	Index
2010A13 Drawing 1 of 7	Surgery Air Handling Unit Temperature Controls
2010A13 Drawing 2 of 7	Surgery Air Handling Unit Temperature Control Panel
2010A13 Drawing 3 of 7	Tracking Pressurization Control
2010A13 Drawing 4 of 7	O.R. Pressurization and Temperature Control Panel
2010A13 Drawing 5 of 7	Hot Water System Temperature Controls
2010A13 Drawing 6 of 7	VAV Box Temperature Controls
2010A13 Drawing 7 of 7	Communications Layout and Unit Heater Controls

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## SECTION 01 91 00

### GENERAL COMMISSIONING REQUIREMENTS

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. This Section 01 91 00 GENERAL COMMISSIONING REQUIREMENTS shall form the basis of the commissioning process and procedures. The Commissioning Agent shall add, modify, and refine the commissioning procedures, as approved by the Department of Veterans Affairs (VA), to suit field conditions and actual manufacturer's equipment, incorporate test data and procedure results, and provide detailed scheduling for all commissioning tasks.
- B. Commissioning is a systematic process of verifying that the building systems perform interactively according to the as-built construction documents and the VA's operational needs. The commissioning process shall encompass and coordinate the system documentation, control system calibration, testing and balancing, performance testing and training. Commissioning during post-occupancy phase is intended to achieve the following specific objectives according to the contract documents:
1. Verify that the applicable equipment and systems are installed in accordance with the contract documents and according to the manufacturer's recommendations.
  2. Verify and document proper integrated performance of equipment and systems.
  3. Verify that Operations & Maintenance documentation is complete.
  4. Verify that all components requiring servicing can be accessed, serviced and removed without disturbing nearby components including ducts, piping, cabling or wiring.
  5. Verify that the VA's operating personnel are adequately trained to enable them to operate, monitor, adjust, maintain, and repair building systems in an effective and energy-efficient manner.
  6. Document the successful achievement of the commissioning objectives listed above.
- C. The Commissioning Agent Firm shall be certified by the Association of Energy Engineers as a Certified Building Commissioning Firm (CBCF). The individual designated as the Commissioning Agent, shall be certified by the Association of Energy Engineers as a Certified Building Commissioning Professional. Commissioning Firm and agent shall have prior experience in commissioning hospital HVAC systems

and provide references. Proof of certification(s) shall be submitted to the Contracting Officer and the Resident Engineer prior to award of contract.

- D. The Test & Balance agent shall be certified by at least one of the following entities: the National Environmental Balancing Bureau (NEBB), the Associated Air Balance Council Commissioning Group (AABC), and the Building Commissioning Association (BCA). Certification(s) shall be valid and active. Proof of certification(s) shall be submitted to the Contracting Officer and the Resident Engineer prior to the Notice to Proceed.

## 1.2 RELATED WORK

- A. Section 01 00 00 GENERAL REQUIREMENTS.
- B. Section 23 08 00 COMMISSIONING OF HVAC SYSTEMS.

## 1.3 SUMMARY

- A. This Section includes general requirements that apply to implementation of commissioning without regard to systems, subsystems, and equipment being commissioned.
- B. The commissioning activities have been developed to support the VA requirements to meet guidelines for Federal Leadership in Environmental, Energy, and Economic Performance.
- C. The commissioning activities have been developed to support the Green Buildings Initiative Green Globes rating program and to support delivery of project performance in accordance with the VA requirements developed for the project.

## 1.4 DEFINITIONS

- A. CxA: Commissioning Agent.
- B. Commissioning Plan: a document that is an overall plan that outlines the commissioning process, commissioning team responsibilities, schedule for commissioning activities, and commissioning documents.
- C. Commissioning Issue: a condition in the installation or function of a component, piece of equipment or system that affects the system operations, maintenance, and/or repair.
- D. Commissioning Observation: a condition in the installation or function of a component, piece of equipment or system that may not be in compliance with the as-built construction documents, or may not be in compliance with the manufacturer's installation instruction, or may not be in compliance with generally accepted industry standards.

- E. Systems Functional Performance Test: a test, or tests, of the dynamic function and operation of equipment and systems using manual (direct observation) or monitoring methods. Systems Functional Performance Testing is the dynamic testing of systems (rather than just components) under full operation (e.g., the chiller pump is tested interactively with the chiller functions to see if the pump ramps up and down to maintain the differential pressure setpoint). Systems are tested under various modes, such as during low cooling or heating loads, high loads, component failures, unoccupied, varying outside air temperatures, fire alarm, power failure, etc. The systems are run through all the control system's sequences of operation and components are verified to be responding as the sequences state. Traditional air or water test and balancing (TAB) is not Systems Functional Performance Testing, in the commissioning sense of the word. TAB's primary work is setting up the system flows and pressures as specified, while System Functional Performance Testing is verifying that the system has already been set up properly and is functioning in accordance with the as-built construction documents. The Commissioning Agent develops the Systems Functional Performance Test Procedures in a sequential written form, coordinates, witnesses, and documents the actual testing. Systems Functional Performance Testing is performed by the Contractor. Systems Functional Performance Tests are performed after startups, control systems are complete and operational, TAB functions and Pre-Functional Checklists are complete.
- F. System: A system is defined as the entire set of components, equipment, and subsystems which must be coordinated to work together during normal operation to produce results for which the system is designed. For example, air conditioning supply air is only one component of an entire system which provides comfort conditions for a building. Other related components are return air, exhaust air, steam supply, chilled water supply, refrigerant supply, hot water supply, controls and electrical service, etc. Another example of a system which involves several components of different disciplines is a boiler installation. Efficient and acceptable boiler operation depends upon the coordination and proper operation of the fuel supply, combustion air, controls, steam, feedwater supply, condensate return and other related components.
- G. Pre-Functional Checklist: a list of items provided by the Commissioning Agent to the Contractor that require inspection and elementary component tests conducted to verify proper installation of equipment. Pre-Functional Checklists are primarily static inspections and procedures to prepare the equipment or system for initial operation (e.g., belt tension, oil levels OK, labels affixed, gages in place, sensors calibrated, etc.). However, some Pre-Functional Checklist items entail simple testing of the function of a component, a piece of equipment or system (such

as measuring the voltage imbalance on a three-phase pump motor of a chiller system). The term "Pre-Functional" refers to before Systems Functional Performance Testing. Pre-Functional Checklists augment and are combined with the manufacturer's startup checklist and the Contractor's Quality Control checklists.

H. Seasonal Functional Performance Testing: a test or tests that are deferred until the system will experience conditions closer to their design conditions.

I. VA: Includes the Contracting Officer, Resident Engineer, or other authorized representative of the Department of Veterans Affairs.

J. TAB: Testing, Adjusting, and Balancing.

#### 1.5 SYSTEMS TO BE COMMISSIONED

A. Commissioning of a system or systems specified for this project is an operational verification from the construction process. Documentation and testing of these systems, as well as training of the VA's Operation and Maintenance personnel, is required in cooperation with the VA and the Commissioning Agent.

B. The following systems will be commissioned as part of this project:

##### 1. Facility exterior closure (Division 7 and Division 8)

a. Louvers and Vents

b. Sealants (Caulking, mechanical seals, and wind and vapor barriers)

##### 2. HVAC (Division 23)

a. Heating Hot Water Systems (heat exchangers, controls, instrumentation and gages, flues, heating water pumps and motors, Variable Speed Drives, mixing valves).

b. Condensate Return Systems (Condensate receivers and transfer pumps, motors, controls, pump alternator, alarms and instrumentation, safeties).

c. Chilled Water Systems (Chilled water pumps and motors, Variable Speed Drives, chiller motor/compressor, controls, instrumentation and safeties, isolation valves, blending valves, side stream water cleaners/scrubbers/filters).

d. Condenser Water Systems for Chillers (Condenser water pumps and motors, Variable Speed Drives, cooling tower fans, cooling tower sump level controls, open-circuit water treatment system, water treatment injection pumps and motors, water treatment controls, cooling tower basin heaters and controls, side stream water cleaners/scrubbers/filters, tower bypass valves).

- e. Exhaust Fans (Fan, motor, Variable Speed Drives, controls and safeties).
  - f. Steam System (controls, gages and instrumentation, safety relief valves).
  - g. Direct Digital Control System (BACnet or similar Local Area Network (LAN), Operator Work Station hardware and software, building controller hardware and software, terminal unit controller hardware and software, all sequences of operation, system accuracy and response time).
  - h. OR Air Handling Systems (Fans, motors, Variable Speed Drives, cooling coils and control valves, heating coils and control valves, filters, HEPA filter performance, dampers, safeties such as smoke detectors or freezestats and damper end switches, controls, gages, and vibration isolation).
  - i. Room Pressurization Equipment (Pressure sensors, terminal units/dampers, and controls and alarms).
3. Site Utility Systems (Division 31)
- a. Steam Condensate Pump Stations (Condensate receivers and transfer pumps, motors, controls, pump alternator, alarms and instrumentation, and safeties).

#### 1.6 COMMISSIONING TEAM

Note: If the commissioning firm is also the prime contractor, all references to "contractor" in these specifications will be met by the commissioning firm.

##### A. Members Appointed by Contractor:

- 1. Contractor: The designated person, company, or entity that plans, schedules and coordinates the commissioning activities for the commissioning team.
- 2. Contractor's Commissioning Representative(s): Individual(s), each having authority to act on behalf of the entity he or she represents, explicitly organized to implement the commissioning process through coordinated actions. The commissioning team shall consist of, but not be limited to, representatives of Contractor, including Project Superintendent and subcontractors, and specialists deemed appropriate by the Department of Veterans Affairs (VA) and Commissioning Agent.
- 3. Commissioning Agent: The designated person, company, or entity that plans, schedules, and coordinates the commissioning team to implement the commissioning process.

##### B. Members Appointed by VA:

- 1. Representatives of the facility user and operation and maintenance personnel.

#### 1.7 VA'S COMMISSIONING RESPONSIBILITIES

- A. Assign operation and maintenance personnel and schedule them to participate in commissioning team activities including, but not limited to, the following:
  - 1. Coordination meetings.
  - 2. Training in operation and maintenance of systems, subsystems, and equipment.
  - 3. Testing meetings.
  - 4. Witness and assist in Systems Functional Performance Testing.
  - 5. Demonstration of operation of systems, subsystems, and equipment.
- B. Provide the as-built construction documents to the Commissioning Agent and for use in managing the commissioning process, developing the commissioning plan, systems manuals, and reviewing the operation and maintenance training plan.

#### 1.8 CONTRACTOR'S COMMISSIONING RESPONSIBILITIES

- A. Appoint an individual, company or firm to act as the Commissioning Agent.
- B. The Contractor shall assign a Commissioning Manager to manage commissioning activities of the Contractor, and subcontractors.
- C. The Contractor shall ensure that the commissioning responsibilities outlined in these specifications are included in all subcontracts and that subcontractors comply with the requirements of these specifications.
- D. The Contractor shall ensure that each installing subcontractor shall assign representatives with expertise and authority to act on behalf of the subcontractor and schedule them to participate in and perform commissioning team activities including, but not limited to, the following:
  - 1. Participate in commissioning coordination meetings.
  - 2. Conduct operation and maintenance training sessions in accordance with approved training plans.
  - 3. Verify that Work is complete and systems are operational according to the as-built documents, including calibration of instrumentation and controls.
  - 4. Evaluate commissioning issues and commissioning observations identified in the Commissioning Issues Log, field reports, test reports or other commissioning documents. In collaboration with entity responsible for system and equipment installation, recommend corrective action.

5. Review and comment on commissioning documentation.
6. Participate in meetings to coordinate Systems Functional Performance Testing.
7. Provide technicians who are familiar with the construction and operation of installed systems and who shall develop specific test procedures to conduct Systems Functional Performance Testing of installed systems.

#### 1.9 COMMISSIONING AGENT'S RESPONSIBILITIES

- A. Organize and lead the commissioning team.
- B. Prepare the commissioning plan. See Paragraph 1.11-A of this specification Section for further information.
- C. Review and comment on as-built construction for general conformance with the as-built construction documents. Review and comment on the ability to test and operate the system and/or equipment, including providing gages, controls and other components required to operate, maintain, and test the system. Review and comment on performance expectations of systems and equipment and interfaces between systems relating to the as-built construction documents.
- D. Convene commissioning team meetings for the purpose of coordination, communication, and conflict resolution; discuss status of the commissioning processes.  
Responsibilities include arranging for facilities, preparing agenda and attendance lists, and notifying participants. The Commissioning Agent shall prepare and distribute minutes to commissioning team members and attendees within five workdays of the commissioning meeting.
- E. Prepare Project specific Pre-Functional Checklists and Systems Functional Performance Test procedures.
- F. Coordinate Systems Functional Performance Testing schedule with the Contractor.
- G. Verify selected Pre-Functional Checklists completed and submitted by the Contractor.
- H. Witness and document Systems Functional Performance Testing.
- I. Compile test data, inspection reports, and certificates and include them in the systems manual and commissioning report.
- J. Review and comment on operation and maintenance (O&M) documentation and systems manual outline for compliance with the as-built contract documents.
- K. Prepare commissioning Field Observation Reports.



- L. Prepare the Final Commissioning Report.
- M. Review with facility staff the current building operation and performance. Also interview facility staff and identify problems or concerns they have operating the building as originally intended. Make suggestions for improvements and for recording these changes in the O&M manuals.
- N. Assemble the final commissioning documentation, including the Final Commissioning Report.

#### 1.10 COMMISSIONING DOCUMENTATION

- A. Commissioning Agent's Certification(s): Commissioning Agent shall submit evidence of valid and current certification(s), as required in Section 1.1(G), to the Contracting Officer.
- B. Commissioning Plan: A document, prepared by Commissioning Agent, that outlines the schedule, allocation of resources, and documentation requirements of the commissioning process, and shall include, but is not limited, to the following:
  - 1. Plan for review of as-built construction, systems manuals, and other documents and reports. Identification of the relationship of these documents to other functions and a detailed description of submittals that are required to support the commissioning processes.
  - 2. Identification of systems and equipment to be commissioned.
  - 4. Schedule of Commissioning Coordination meetings.
  - 5. Identification of items that must be completed before the next operation can proceed.
  - 6. Description of responsibilities of commissioning team members.
  - 7. Description of observations to be made.
  - 8. Description of requirements for operation and maintenance training.
  - 9. Schedule for commissioning activities.
- C. Systems Functional Performance Test Procedures: The Commissioning Agent will develop Systems Functional Performance Test Procedures for each system to be commissioned, including subsystems, or equipment and interfaces or interlocks with other systems. Systems Functional Performance Test Procedures will include a separate entry, with space for comments, for each item to be tested. Preliminary Systems Functional Performance Test Procedures will be provided to the VA, and

Contractor for review and comment. The Systems Performance Test Procedure will include test procedures for each mode of operation and provide space to indicate whether the mode under test responded as required. Each System Functional Performance Test procedure, regardless of system, subsystem, or equipment being tested, shall include, but not be limited to, the following:

1. Name and identification code of tested system.
2. Test number.
3. Time and date of test.
4. Indication of whether the record is for a first test or retest following correction of a problem or issue.
5. Dated signatures of the person performing test and of the witness, if applicable.
6. Individuals present for test.
7. Observations and Issues.
8. Issue number, if any, generated as the result of test.

- D. Pre-Functional Checklists: The Commissioning Agent will prepare Pre-Functional Checklists. Pre-Functional Checklists shall be completed and signed by the Contractor, verifying that systems, subsystems, equipment, and associated controls are ready for testing. The Commissioning Agent will spot check Pre-Functional Checklists to verify accuracy and readiness for testing. Inaccurate or incomplete Pre-Functional Checklists shall be returned to the Contractor for correction and resubmission.
- E. Test and Inspection Reports: The Commissioning Agent will record test data, observations, and measurements on Systems Functional Performance Test Procedure. The report will also include recommendation for system acceptance or non-acceptance. Photographs, forms, and other means appropriate for the application shall be included with data. Commissioning Agent Will compile test and inspection reports and test and inspection certificates and include them in systems manual and commissioning report.
- F. Corrective Action Documents: The Commissioning Agent will document corrective action taken for systems and equipment that fail tests. The documentation will include any required modifications to systems and equipment and/or revisions to test procedures, if any. Contractor is responsible for adjustments to as-built system components and subsequent re-testing. Contact COTR for resolution if any

necessary system components are missing or are inoperable. The Commissioning Agent will witness and document any retesting of systems and/or equipment requiring corrective action and document retest results.

G. Commissioning Issues Log: The Commissioning Agent will prepare and maintain Commissioning Issues Log that describes Commissioning Issues and Commissioning Observations that are identified during the Commissioning process. These observations and issues include, but are not limited to, those that are at variance with the as-built construction documents. The Commissioning Issues Log will identify and track issues as they are encountered, the party responsible for resolution, progress toward resolution, and document how the issue was resolved. The Master Commissioning Issues Log will also track the status of unresolved issues.

1. Creating an Commissioning Issues Log Entry:

- a. Identify the issue with unique numeric or alphanumeric identifier by which the issue may be tracked.
- b. Assign a descriptive title for the issue.
- c. Identify date and time of the issue.
- d. Identify test number of test being performed at the time of the observation, if applicable, for cross reference.
- e. Identify system, subsystem, and equipment to which the issue applies.
- f. Identify location of system, subsystem, and equipment.
- g. Include information that may be helpful in diagnosing or evaluating the issue.
- h. Note recommended corrective action.
- i. Identify commissioning team member responsible for corrective action.
- j. Identify expected date of correction.
- k. Identify person that identified the issue.

2. Documenting Issue Resolution:

- a. Log date correction is completed or the issue is resolved.
- b. Describe corrective action or resolution taken. Include description of diagnostic steps taken to determine root cause of the issue, if any.

- c. Identify changes to the Contract Documents that may require action.
- d. State that correction was completed and system, subsystem, and equipment are ready for retest, if applicable.
- e. Identify person(s) who corrected or resolved the issue.
- f. Identify person(s) verifying the issue resolution.

H. Final Commissioning Report: The Commissioning Agent will document results of the commissioning process, including unresolved issues, and performance of systems, subsystems, and equipment. The Commissioning Report will indicate whether systems, subsystems, and equipment have been properly installed and are performing according to the as-built construction documents. This report will be used by the Department of Veterans Affairs when determining that systems will be accepted. This report will be used to evaluate systems, subsystems, and equipment and will serve as a future reference document during VA occupancy and operation. It shall describe components and performance that exceed requirements of the as-built construction Documents and those that do not meet requirements of the as-built construction documents. The commissioning report will include, but is not limited to, the following:

- 1. Lists and explanations of substitutions; compromises; variances with the Contract Documents; record of conditions; and, if appropriate, recommendations for resolution. Design Narrative documentation maintained by the Commissioning Agent.
- 2. Commissioning plan.
- 3. Pre-Functional Checklists completed by the Contractor, with annotation of the Commissioning Agent review and spot check.
- 4. Systems Functional Performance Test Procedures, with annotation of test results and test completion.
- 5. Commissioning Issues Log.
- 6. Listing of deferred and off season test(s) not performed, including the schedule for their completion.

I. Systems Manual: The Commissioning Agent will gather required information and compile the Systems Manual. The Systems Manual will include, but is not limited to, the following:

1. Design Narrative, including system narratives, schematics, single-line diagrams, flow diagrams, equipment schedules, and changes made throughout the Project.
2. Reference to Final Commissioning Plan.
3. Reference to Final Commissioning Report.
4. Approved Operation and Maintenance Data as submitted by the Contractor.

#### 1.11 SUBMITTALS

- A. Preliminary Commissioning Plan Submittal: The Commissioning Agent will prepare a Preliminary Commissioning Plan based on the as-built Construction Documents. The Preliminary Commissioning Plan contains preliminary information about the following commissioning activities:
1. The Commissioning Team: A list of commissioning team members by organization.
  2. Systems to be commissioned. A detailed list of systems to be commissioned for the project. This list also provides preliminary information on as-built systems/equipment submittals to be reviewed by the Commissioning Agent; preliminary information on Pre-Functional Checklists that are to be completed; preliminary information on Systems Performance Testing, including information on testing sample size (where authorized by the VA).
  3. Commissioning Team Roles and Responsibilities: Preliminary roles and responsibilities for each Commissioning Team member.
  4. Commissioning Documents: A preliminary list of commissioning-related documents, include identification of the parties responsible for preparation, review, approval, and action on each document.
  5. Commissioning Activities Schedule: Identification of Commissioning Activities, including Systems Functional Testing, the expected duration and predecessors for the activity.
  6. Pre-Functional Checklists: Preliminary Pre-Functional Checklists for equipment, components, subsystems, and systems to be commissioned. These Preliminary Pre-Functional Checklists provide guidance on the level of detailed information the Contractor shall include on the final submission.
  7. Systems Functional Performance Test Procedures: Preliminary step-by-step System Functional Performance Test Procedures to be used during Systems Functional Performance Testing. These Preliminary Systems Functional Performance

procedures provide information on the level of testing rigor, and the level of Contractor support required during performance of system's testing.

- B. Final Commissioning Plan Submittal: Based on the as-built construction documents and the Contractor's project team, the Commissioning Agent will prepare the Final Commissioning Plan as described in this section. The Commissioning Agent will submit three hard copies and three sets of electronic files of Final Commissioning Plan. The Contractor shall review the Commissioning Plan and provide any comments to the VA. The Commissioning Agent will incorporate review comments into the Final Commissioning Plan as directed by the VA.
- C. Systems Functional Performance Test Procedure: The Commissioning Agent will submit preliminary Systems Functional Performance Test Procedures to the Contractor, and the VA for review and comment. The Contractor shall return review comments to the VA and the Commissioning Agent. The VA will also return review comments to the Commissioning Agent. The Commissioning Agent will incorporate review comments into the Final Systems Functional Test Procedures to be used in Systems Functional Performance Testing.
- D. Pre-Functional Checklists: The Commissioning Agent will submit Pre-Functional Checklists to be completed by the Contractor.
- E. Test and Inspection Reports: The Commissioning Agent will submit test and inspection reports to the VA with copies to the Contractor.
- F. Corrective Action Documents: The Commissioning Agent will submit corrective action documents to the VA Resident Engineer with copies to the Contractor.
- G. Preliminary Commissioning Report Submittal: The Commissioning Agent will submit three electronic copies of the preliminary commissioning report. One electronic copy, with review comments, will be returned to the Commissioning Agent for preparation of the final submittal.
- H. Final Commissioning Report Submittal: The Commissioning Agent will submit four sets of electronically formatted information of the final commissioning report to the VA. The final submittal will incorporate comments as directed by the VA.
- I. Data for Commissioning:
  - 1. The Commissioning Agent will research specific information needed about each piece of commissioned equipment or system to fulfill requirements of the Commissioning Plan.

#### 1.12 COMMISSIONING PROCESS

- A. The Commissioning Agent will be responsible for the overall management of the commissioning process as well as coordinating scheduling of commissioning tasks with the VA and the Contractor. As directed by the VA, the Contractor shall incorporate Commissioning tasks, including, but not limited to, Systems Functional Performance Testing (including predecessors) with the commissioning schedule.
- B. Within 10 days of contract award, the Contractor shall designate a specific individual as the Commissioning Manager (CM) to manage and lead the commissioning effort on behalf of the Contractor. The Commissioning Manager shall be the single point of contact and communications for all commissioning related services by the Contractor.
- C. Within 10 days of contract award, the Contractor shall ensure that each subcontractor designates specific individuals as Commissioning Representatives (CR) to be responsible for commissioning related tasks. The Contractor shall ensure the designated Commissioning Representatives participate in the commissioning process as team members providing commissioning testing services, equipment operation, adjustments, and corrections if necessary. The Contractor shall ensure that all Commissioning Representatives shall have sufficient authority to direct their respective staff to provide the services required, and to speak on behalf of their organizations in all commissioning related contractual matters.

#### 1.13 QUALITY ASSURANCE

- A. Test Equipment Calibration: The Contractor shall comply with test equipment manufacturer's calibration procedures and intervals. Recalibrate test instruments immediately whenever instruments have been repaired following damage or dropping. Affix calibration tags to test instruments. Instruments shall have been calibrated within six months prior to use.

#### 1.14 COORDINATION

- A. Management: The Commissioning Agent will coordinate the commissioning activities with the VA and Contractor. The Commissioning Agent will submit commissioning documents and information to the VA. All commissioning team members shall work together to fulfill their contracted responsibilities and meet the objectives of the contract documents.
- B. Scheduling: The Commissioning Agent will provide sufficient information on commissioning activities to allow the Contractor and the VA to schedule commissioning activities. All parties shall address scheduling issues and make necessary notifications in a timely manner in order to expedite the project and the commissioning process.

- C. Initial Schedule of Commissioning Events: The Commissioning Agent will provide the initial schedule of primary commissioning events in the Commissioning Plan and at the commissioning coordination meetings. The Commissioning Plan will provide a format for this schedule.
- D. Commissioning Coordinating Meetings: The Commissioning Agent will conduct periodic Commissioning Coordination Meetings of the commissioning team to review status of commissioning activities, to discuss scheduling conflicts, and to discuss upcoming commissioning process activities.
- E. Pretesting Meetings: The Commissioning Agent will conduct pretest meetings of the commissioning team to review Pre-Functional Checklist results, Systems Functional Performance Testing procedures, testing personnel and instrumentation requirements.
- F. Systems Functional Performance Testing Coordination: The Contractor shall coordinate testing activities to accommodate required quality assurance and control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting. The Contractor shall coordinate the schedule times for tests, inspections, obtaining samples, and similar activities.

## PART 2 - PRODUCTS

### 2.1 TEST EQUIPMENT

- A. The Contractor shall provide all standard and specialized testing equipment required to perform Systems Functional Performance Testing. Test equipment required for Systems Functional Performance Testing will be identified in the detailed System Functional Performance Test Procedure prepared by the Commissioning Agent.
- B. Data logging equipment and software required to test equipment shall be provided by the Contractor.
- C. All testing equipment shall be of sufficient quality and accuracy to test and/or measure system performance with the tolerances specified in the Specifications. If not otherwise noted, the following minimum requirements apply: Temperature sensors and digital thermometers shall have a certified calibration within the past year to an accuracy of 0.5 °C (1.0 °F) and a resolution of + or - 0.1 °C (0.2 °F). Pressure sensors shall have an accuracy of + or - 2.0% of the value range being measured (not full range of meter) and have been calibrated within the last year. All equipment shall be calibrated according to the manufacturer's recommended intervals and when dropped or damaged. Calibration tags shall be affixed or certificates readily available.



## PART 3 - EXECUTION

### 3.1 STARTUP, INITIAL CHECKOUT, AND PRE-FUNCTIONAL CHECKLISTS

- A. The following procedures shall apply to all equipment and systems to be commissioned, according to Part 1, Systems to Be Commissioned.
  1. Pre-Functional Checklists are important to ensure that the equipment and systems are hooked up and operational. These ensure that Systems Functional Performance Testing may proceed without unnecessary delays. Each system to be commissioned shall have a full Pre-Functional Checklist completed by the Contractor prior to Systems Functional Performance Testing. No sampling strategies are used.
    - a. The Pre-Functional Checklist will identify the trades responsible for completing the checklist. The Contractor shall ensure the appropriate trades complete the checklists.
    - b. The Commissioning Agent will review completed Pre-Functional Checklists and field-verify the accuracy of the completed checklist using sampling techniques.
  2. Sensor and Actuator Calibration
    - a. All field installed temperature, relative humidity, and pressure sensors and gages, and all actuators (dampers and valves) on all equipment shall be calibrated.
    - b. All procedures used shall be fully documented on the Pre-Functional Checklists or other suitable forms, clearly referencing the procedures followed and written documentation of initial, intermediate and final results.

### 3.2 DEFICIENCIES, NONCONFORMANCE, AND APPROVAL IN CHECKLISTS AND STARTUP

- A. The Contractor shall clearly list any outstanding items of the Pre-Functional Checklist procedures that were not completed successfully, at the bottom of the procedures form or on an attached sheet. The procedures form and any outstanding deficiencies shall be provided to the VA and the Commissioning Agent within two days of completion.
- B. The Commissioning Agent will review the report and submit comments to the VA. The Commissioning Agent will work with the Contractor to correct and verify deficiencies or uncompleted items. The Commissioning Agent will involve the VA and others as necessary. The Contractor shall correct all areas that are noncompliant or incomplete in the checklists in a timely manner, and shall notify the VA and Commissioning Agent as soon as outstanding items have been corrected. The

Contractor shall submit an updated startup report and a Statement of Correction on the original noncompliance report. When satisfactorily completed, the Commissioning Agent will recommend approval of the checklists to the VA.

- C. The Contractor shall be responsible for resolution of deficiencies on all existing system components to include instrument calibrations, programming sequences, controls adjustments, and balancing adjustments. Contact COTR for resolution of deficiencies on any system components that are missing, inoperable, incorrectly installed, or incorrect component installed.

### 3.3 PHASED COMMISSIONING

- A. The project may require startup and initial checkout to be executed in phases. This phasing shall be planned and scheduled in a coordination meeting of the VA, Commissioning Agent, and the Contractor. Results will be added to the commissioning schedule.

### 3.4 TRENDING AND ALARMS

- A. Trending is a method of testing as a standalone method or to augment manual testing. The Contractor shall trend any and all points of the system or systems at intervals specified below.
- B. Alarms are a means to notify the system operator that abnormal conditions are present in the system. Alarms shall be structured into three tiers - Critical, Priority, and Maintenance.
  - 1. Critical alarms are intended to be alarms that require the immediate attention of and action by the Operator. These alarms shall be displayed on the Operator Workstation in a popup style window that is graphically linked to the associated unit's graphical display. The popup style window shall be displayed on top of any active window within the screen, including non DDC system software.
  - 2. Priority level alarms are to be printed to a printer which is connected to the Operator's Work Station located within the engineer's office. Additionally Priority level alarms shall be able to be monitored and viewed through an active alarm application. Priority level alarms are alarms which shall require reaction from the operator or maintenance personnel within a normal work shift, and not immediate action.
  - 3. Maintenance alarms are intended to be minor issues which would require examination by maintenance personnel within the following shift. These alarms shall be generated in a scheduled report automatically by the DDC system at the start of each shift. The generated maintenance report will be printed to a printer located within the engineer's office.

C. The Contractor shall provide graphical trending through the DDC control system of systems being commissioned. Trending requirements are indicated below and included with the Systems Functional Performance Test Procedures. Trending shall occur before, during and after Systems Functional Performance Testing. The Contractor shall be responsible for producing graphical representations of the trended DDC points that show each system operating properly during steady state conditions as well as during the System Functional Testing. These graphical reports shall be submitted to the Resident Engineer and Commissioning Agent for review and analysis before, during dynamic operation, and after Systems Functional Performance Testing. The Contractor shall provide, but not limited to, the following trend requirements and trend submissions:

1. Pre-testing, Testing, and Post-testing - Trend reports of trend logs and graphical trend plots are required as defined by the Commissioning Agent. The trend log points, sampling rate, graphical plot configuration, and duration will be dictated by the Commissioning Agent. At any time during the Commissioning Process the Commissioning Agent may recommend changes to aspects of trending as deemed necessary for proper system analysis. The Contractor shall implement any changes as directed by the Resident Engineer. Any pre-test trend analysis comments generated by the Commissioning Team should be addressed and resolved by the Contractor, as directed by the Resident Engineer, prior to the execution of Systems Functional Performance Testing.
2. Dynamic plotting - The Contractor shall also provide dynamic plotting during Systems Functional Performance testing at frequent intervals for points determined by the Systems Functional Performance Test Procedure. The graphical plots will be formatted and plotted at durations listed in the Systems Functional Performance Test Procedure.
3. Graphical plotting - The graphical plots shall be provided with a dual y-axis allowing 15 or more trend points (series) plotted simultaneously on the graph with each series in distinct color. The plots will further require title, axis naming, legend etc. all described by the Systems Functional Performance Test Procedure. If this cannot be sufficiently accomplished directly in the Direct Digital Control System then it is the responsibility of the Contractor to plot these trend logs in Microsoft Excel.
4. The following tables indicate the points to be trended and alarmed by system. The Operational Trend Duration column indicates the trend duration for normal operations. The Testing Trend Duration column indicates the trend duration prior to Systems Functional Performance Testing and again after Systems Functional Performance Testing. The Type column indicates point type: AI =

Analog Input, AO = Analog Output, DI = Digital Input, DO = Digital Output, Calc = Calculated Point. In the Trend Interval Column, COV = Change of Value. The Alarm Type indicates the alarm priority; C = Critical, P = Priority, and M = Maintenance. The Alarm Range column indicates when the point is considered in the alarm state. The Alarm Delay column indicates the length of time the point must remain in an alarm state before the alarm is recorded in the DDC. The intent is to allow minor, short-duration events to be corrected by the DDC system prior to recording an alarm. Refer to as-built mechanical and control drawings for any additional points that need to be trended and alarmed as deemed necessary by the commissioning agent.

Dual-Path Air Handling Unit Trending and Alarms							
Point	Type	Trend Interval	Operational Trend Duration	Testing Trend Duration	Alarm Type	Alarm Range	Alarm Delay
OA Temperature	AI	15 Min	24 hours	3 days	N/A		
RA Temperature	AI	15 Min	24 hours	3 days	N/A		
RA Humidity	AI	15 Min	24 hours	3 days	P	>60% RH	10 min
Mixed Air Temp	AI	None	None	None	N/A		
SA Temp	AI	15 Min	24 hours	3 days	C	±5°F from SP	10 min
Supply Fan Speed	AI	15 Min	24 hours	3 days	N/A		
Return Fan Speed	AI	15 Min	24 hours	3 days	N/A		
RA Pre-Filter Status	AI	None	None	None	N/A		
OA Pre-Filter Status	AI	None	None	None	N/A		
After Filter Status	AI	None	None	None	N/A		

Dual-Path Air Handling Unit Trending and Alarms							
Point	Type	Trend Interval	Operational Trend Duration	Testing Trend Duration	Alarm Type	Alarm Range	Alarm Delay
SA Flow	AI	15 Min	24 hours	3 days	C	±10% from SP	10 min
OA Supply Temp	AI	15 Min	24 hours	3 days	P	±5°F from SP	10 min
RA Supply Temp	AI	15 Min	24 hours	3 days	N/A		
CHW Valve Position	AI	15 Min	24 hours	3 days	N/A		
HW Valve Position	AI	15 Min	24 hours	3 days	N/A		
OA Flow	AI	15 Min	24 hours	3 days	P	±10% from SP	5 min
RA Flow	AI	15 Min	24 hours	3 days	P	±10% from SP	5 min
Initial UVC Intensity (%)	AI	None	None	None	N/A		
Duct Pressure	AI	15 Min	24 hours	3 days	C	±25% from SP	6 min
Supply Fan Status	DI	COV	24 hours	3 days	C	Status <> Command	10 min
Return Fan Status	DI	COV	24 hours	3 days	C	Status <> Command	10 Min
High Static Status	DI	COV	24 hours	3 days	P	True	1 min
Fire Alarm Status	DI	COV	24 hours	3 days	C	True	5 min
Freeze Stat Level 1	DI	COV	24 hours	3 days	C	True	10 min

Dual-Path Air Handling Unit Trending and Alarms							
Point	Type	Trend Interval	Operational Trend Duration	Testing Trend Duration	Alarm Type	Alarm Range	Alarm Delay
Freeze Stat Level 2	DI	COV	24 hours	3 days	C	True	5 min
Fire/Smoke Damper Status	DI	COV	24 hours	3 days	P	Closed	1 min
Emergency AHU Shutdown	DI	COV	24 hours	3 days	P	True	1 min
Exhaust Fan #1 Status	DI	COV	24 hours	3 days	C	Status <> Command	10 min
Exhaust Fan #2 Status	DI	COV	24 hours	3 days	C	Status <> Command	10 min
Exhaust Fan #3 Status	DI	COV	24 hours	3 days	C	Status <> Command	10 min
OA Alarm	DI	COV	24 hours	3 days	C	True	10 min
High Static Alarm	DI	COV	24 hours	3 days	C	True	10 min
UVC Emitter Alarm	DI	COV	24 hours	3 days	P	True	10 min
Power Failure	DI	COV	24 hours	3 days	P	True	1 min
Supply Fan Speed	AO	15 Min	24 hours	3 days	N/A		
Return Fan Speed	AO	15 Min	24 hours	3 days	N/A		

Dual-Path Air Handling Unit Trending and Alarms							
Point	Type	Trend Interval	Operationa l Trend Duration	Testing Trend Duration	Alarm Type	Alarm Range	Alarm Delay
Supply Fan S/S	DO	COV	24 hours	3 days	N/A		
Return Fan S/S	DO	COV	24 hours	3 days	N/A		
AHU Energy	Calc	1 Hour	30 day	N/A	N/A		
AHU Energy	Calc	1 Hour	30 day	N/A	N/A		

Terminal Unit (VAV, CAV, etc.) Trending and Alarms							
Point	Type	Trend Interval	Operationa l Trend Duration	Testing Trend Duration	Alarm Type	Alarm Range	Alarm Delay
Space Temperature	AI	15 Min	12 hours	3 days	P	±5°F from SP	10 min
Air Flow	AI	15 Min	12 hours	3 days	P	±5°F from SP	10 min
SA Temperature	AI	15 Min	12 hours	3 days	P	±5°F from SP	10 min
Local Setpoint	AI	15 Min	12 hours	3 days	M	±10°F from SP	60 min

Terminal Unit (VAV, CAV, etc.) Trending and Alarms							
Point	Type	Trend Interval	Operational Trend Duration	Testing Trend Duration	Alarm Type	Alarm Range	Alarm Delay
Space Humidity	AI	15 Min	12 hours	3 days	P	> 60% RH	5 min
Unoccupied Override	DI	COV	12 hours	3 days	M	N/A	12 Hours
Damper Position	AO	15 Minutes	12 hours	3 days	N/A		
Heating coil Valve Position	AO	15 Minutes	12 hours	3 days	N/A		

Unit Heater Trending and Alarms							
Point	Type	Trend Interval	Operational Trend Duration	Testing Trend Duration	Alarm Type	Alarm Range	Alarm Delay
Space Temperature	AI	15 Minutes	12 hours	3 days	P	±5°F from SP	10 min
Heating Valve Position	AO	15 Minutes	12 hours	3 days	N/A		
Unit Heater ON/OFF	DO	COV	12 hours	3 days	M	Status <> Command	30 min

Hydronic Hot Water Trending and Alarms							
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Point	Type	Trend Interval	Operational Trend Duration	Testing Trend Duration	Alarm Type	Alarm Range	Alarm Delay
System HWS Temperature	AI	15 min	12 hours	3 days	C	±5°F from SP	10 Min
System HWR Temperature	AI	15 min	12 hours	3 days	M	±15°F from SP	300 Min
HX-1 Entering Temperature	AI	15 min	12 hours	3 days	P	±5°F from SP	10 Min
HX-2 Entering Temperature	AI	15 min	12 hours	3 days	P	±5°F from SP	10 Min
HX-2 Leaving Temperature	AI	15 min	12 hours	3 days	P	±5°F from SP	10 Min
System Flow (GPM)	AI	15 min	12 hours	3 days	N/A		
System Differential Pressure	AI	15 min	12 hours	3 days	P	±10% from SP	8 Min
				3 days			
HW Pump 1 Status	DI	COV	12 Hours	3 days	C	Status <> Command	30 min
HW Pump 2 Status	DI	COV	12 Hours	3 days	C	Status <> Command	30 min
HW Pump 1 VFD Speed	AO	15 Min	12 Hours	3 days	N/A		
HW Pump 2 VFD Speed	AO	15 Min	12 Hours	3 days	N/A		
Steam Station #1 Control Valve Position	AO	15 Min	12 Hours	3 days	N/A		

Hydronic Hot Water Trending and Alarms							
Point	Type	Trend Interval	Operationa l Trend Duration	Testing Trend Duration	Alarm Type	Alarm Range	Alarm Delay
Steam Station #2 Control Valve Position	AO	15 Min	12 Hours	3 days	N/A		
Steam Station Bypass Valve Position	AO	15 Min	12 Hours	3 days	N/A		
HW Pump 1 Start/Stop	DO	COV	12 Hours	3 days	N/A		
HW Pump 2 Start/Stop	DO	COV	12 Hours	3 days	N/A		
HWR #1 Valve	DO	COV	12 Hours	3 days	N/A		
HWR #2 Valve	DO	COV	12 Hours	3 days	N/A		

Chilled Water System Trending and Alarms							
Point	Type	Trend Interval	Operationa l Trend Duration	Testing Trend Duration	Alarm Type	Alarm Range	Alarm Delay
Chiller 3 Entering Temperature	AI	15 Minutes	12 Hours	3 days	N/A		
Chiller 3 Leaving Temperature	AI	15 Minutes	12 Hours	3 days	P	±5°F from SP	10 Min
Chiller 3 Flow	AI	15 Minutes	12 Hours	3 days	N/A		
Chiller 3 Percent Load	AI	15 Minutes	12 Hours	3 days	N/A		

Chilled Water System Trending and Alarms							
Point	Type	Trend Interval	Operational Trend Duration	Testing Trend Duration	Alarm Type	Alarm Range	Alarm Delay
Chiller 3 KW Consumption	AI	15 Minutes	12 Hours	3 days	N/A		
Chiller 3 Tonnage	AI	15 Minutes	12 Hours	3 days	N/A		
Primary Loop Flow	AI	15 Minutes	12 Hours	3 days	N/A		
Primary Loop Supply Temperature	AI	15 Minutes	12 Hours	3 days	N/A		
Secondary Loop Differential Pressure	AI	15 Minutes	12 Hours	3 days	P	±5% from SP	10 Min
Secondary Loop Flow	AI	15 Minutes	12 Hours	3 days	N/A		
Secondary Loop Supply Temperature	AI	15 Minutes	12 Hours	3 days	N/A		
Secondary Loop Return Temperature	AI	15 Minutes	12 Hours	3 days	N/A		
Secondary Loop Tonnage	AI	15 Minutes	12 Hours	3 days	N/A		

Chilled Water System Trending and Alarms							
Point	Type	Trend Interval	Operational Trend Duration	Testing Trend Duration	Alarm Type	Alarm Range	Alarm Delay
Primary Loop Pump 1 Status	DI	COV	12 Hours	3 days	C	Status <> Command	30 min
Chiller 3 Status	DI	COV	12 Hours	3 days	C	Status <> Command	30 min
Chiller 3 Evaporator Iso-Valve	DI	COV	12 Hours	3 days	N/A		
Chiller 3 Evaporator Flow Switch	DI	COV	12 Hours	3 days	N/A		
Chiller 3 Unit Alarm	DI	COV	12 Hours	3 days	C	True	10 Min
Refrigerant Detector	DI	COV	12 Hours	3 days	C	True	10 Min
Refrigerant Exhaust Fan Status	DI	COV	12 Hours	3 days	M	Status <> Command	30 min
Emergency Shutdown	DI	COV	12 Hours	3 days	P	True	1 Min

Chilled Water System Trending and Alarms							
Point	Type	Trend Interval	Operationa l Trend Duration	Testing Trend Duration	Alarm Type	Alarm Range	Alarm Delay
Secondary Loop Pump 1 VFD Speed	AO	15 Minutes	12 Hours	3 days	N/A		
Secondary Loop Pump 2 VFD Speed	AO	15 Minutes	12 Hours	3 days	N/A		
Primary Pump 1 Start / Stop	DO	COV	12 Hours	3 days	N/A		
Chiller 3 Enable	DO	COV	12 Hours	3 days	N/A		
Chiller 3 Iso-Valve Command	DO	COV	12 Hours	3 days	N/A		
Refrigerant Exhaust Fan Start / Stop	DO	COV	12 Hours	3 days	N/A		

Condenser Water System Trending and Alarms							
Point	Type	Trend Interval	Operationa l Trend Duration	Testing Trend Duration	Alarm Type	Alarm Range	Alarm Delay
Chiller 3 Condenser Entering Temp	AI	15 Minutes	12 Hours	3 days	N/A		

Condenser Water System Trending and Alarms							
Point	Type	Trend Interval	Operational Trend Duration	Testing Trend Duration	Alarm Type	Alarm Range	Alarm Delay
Chiller 3 Condenser Leaving Temp	AI	15 Minutes	12 Hours	3 days	N/A		
Cooling Tower 5 Supply Temp	AI	15 Minutes	12 Hours	3 days	N/A		
Cooling Tower 5 Return Temp	AI	15 Minutes	12 Hours	3 days	N/A		
Cooling Tower 5 Basin Temp	AI	15 Minutes	12 Hours	3 days	P	< 45 °F	10 Min
Condenser Water Supply Temp	AI	15 Minutes	12 Hours	3 days	N/A		
Condenser Water Return Temp	AI	15 Minutes	12 Hours	3 days	N/A		
Outdoor Air Wet Bulb	AI	15 Minutes	12 Hours	3 days	N/A		
Cooling Tower 5 Fan Status	DI	COV	12 Hours	3 days	P	Status <> Command	1 min
Cooling Tower 5 Basin Heat	DI	COV	12 Hours	3 days	N/A		
Cooling Tower 5 Heat Trace	DI	COV	12 Hours	3 days	N/A		

Condenser Water System Trending and Alarms							
Point	Type	Trend Interval	Operational Trend Duration	Testing Trend Duration	Alarm Type	Alarm Range	Alarm Delay
Chiller 3 Isolation Valve	DI	COV	12 Hours	3 days	P	Status <> Command	1 min
Condenser Water Pump Status	DI	COV	12 Hours	3 days	P	Status <> Command	1 min
Cooling Tower 5 Bypass Valve	AO	15 Minutes	12 Hours	3 days	N/A		
Cooling Tower 5 Fan Speed	AO	15 Minutes	12 Hours	3 days	N/A		
Cooling Tower 5 Fan Start / Stop	DO	COV	12 Hours	3 days	N/A		
Condenser Water Pump Start / Stop	DO	COV	12 Hours	3 days	N/A		

E. The Contractor shall provide the following information prior to Systems Functional Performance Testing. Any documentation that is modified after submission shall be recorded and resubmitted to the Resident Engineer and Commissioning Agent.

1. Point-to-Point checkout documentation;
2. Sensor field calibration documentation including system name, sensor/point name, measured value, DDC value, and Correction Factor.
3. A sensor calibration table listing the referencing the location of procedures to following in the O&M manuals, and the frequency at which calibration should be performed for all sensors, separated by system, subsystem, and type. The calibration requirements shall be submitted both in the O&M manuals and separately in a standalone document containing all sensors for inclusion in the commissioning documentation. The following table is a sample that can be used as a template for submission.

SYSTEM		
Sensor	Calibration Frequency	O&M Calibration Procedure Reference
Discharge air temperature	Once a year	Volume I Section D.3.aa
Discharge static pressure	Every 6 months	Volume II Section A.1.c

4. Loop tuning documentation and constants for each loop of the building systems. The documentation shall be submitted in outline or table separated by system, control type (e.g. heating valve temperature control); proportional, integral and derivative constants, interval (and bias if used) for each loop. The following table is a sample that can be used as a template for submission.

AIR HANDLING UNIT AHU-1				
Control Reference	Proportional Constant	Integral Constant	Derivative Constant	Interval
Heating Valve Output	1000	20	10	2 sec.

### 3.5 SYSTEMS FUNCTIONAL PERFORMANCE TESTING

- A. This paragraph applies to Systems Functional Performance Testing of systems for all referenced specification Divisions.



- B. Objectives and Scope: The objective of Systems Functional Performance Testing is to demonstrate that each system is operating according to the as-built construction documents. Systems Functional Performance Testing facilitates bringing the systems from a state of substantial completion to full dynamic operation. Additionally, during the testing process, areas of noncompliant performance are identified and corrected, thereby improving the operation and functioning of the systems. In general, each system shall be operated through all modes of operation (seasonal, occupied, unoccupied, warm-up, cool-down, part- and full-load, fire alarm and emergency power) where there is a specified system response. The Contractor shall verify each sequence in the sequences of operation. Proper responses to such modes and conditions as power failure, freeze condition, low oil pressure, no flow, equipment failure, etc. shall also be tested.
- C. Development of Systems Functional Performance Test Procedures: Before Systems Functional Performance Test procedures are written, the Contractor shall provide all requested documentation including an updated points list, program code, control sequences and parameters. Using the testing parameters and requirements found in the as-built construction documents and approved submittals and shop drawings, the Commissioning Agent will develop specific Systems Functional Test Procedures to verify and document proper operation of each piece of equipment and system to be commissioned. The Contractor shall assist the Commissioning Agent in developing the Systems Functional Performance Test procedures as requested by the Commissioning Agent i.e. by answering questions about equipment, operation, sequences, etc. Prior to execution, the Commissioning Agent will provide a copy of the Systems Functional Performance Test procedures to the VA, the Architect/Engineer, and the Contractor, who shall review the tests for feasibility, safety, equipment and warranty protection.
- D. Purpose of Test Procedures: The purpose of each specific Systems Functional Performance Test is to verify and document compliance with the stated criteria of acceptance given on the test form. Representative test formats and examples are found in the Commissioning Plan for this project. (The Commissioning Plan is issued as a separate document and is available for review.) The test procedure forms developed by the Commissioning Agent will include, but not be limited to, the following information:
1. System and equipment or component name(s)
  2. Equipment location and ID number
  3. Unique test ID number, and reference to unique Pre-Functional Checklists and startup documentation, and ID numbers for the piece of equipment.

4. Date
5. Project name
6. Participating parties
7. A copy of the specification section describing the test requirements
8. A copy of the specific sequence of operations or other specified parameters being verified
9. Formulas used in any calculations
10. Required pretest field measurements
11. Instructions for setting up the test.
12. Special cautions, alarm limits, etc.
13. Specific step-by-step procedures to execute the test, in a clear, sequential and repeatable format
14. Acceptance criteria of proper performance with a Yes / No check box to allow for clearly marking whether or not proper performance of each part of the test was achieved.
15. A section for comments.
16. Signatures and date block for the Commissioning Agent. A place for the Contractor to initial to signify attendance at the test.

E. Test Methods: Systems Functional Performance Testing shall be achieved by manual testing (i.e. persons manipulate the equipment and observe performance) and/or by monitoring the performance and analyzing the results using the control system's trend log capabilities or by standalone data loggers. The Contractor and Commissioning Agent shall determine which method is most appropriate for tests that do not have a method specified.

1. Simulated Conditions: Simulating conditions (not by an overwritten value) shall be allowed, although timing the testing to experience actual conditions is encouraged wherever practical.
2. Overwritten Values: Overwriting sensor values to simulate a condition, such as overwriting the outside air temperature reading in a control system to be something other than it really is, shall be allowed, but shall be used with caution and avoided when possible. Such testing methods often can only test a

part of a system, as the interactions and responses of other systems will be erroneous or not applicable. Simulating a condition is preferable. e.g., for the above case, by heating the outside air sensor with a hair blower rather than overwriting the value or by altering the appropriate setpoint to see the desired response. Before simulating conditions or overwriting values, sensors, transducers and devices shall have been calibrated.

3. Simulated Signals: Using a signal generator which creates a simulated signal to test and calibrate transducers and DDC constants is generally recommended over using the sensor to act as the signal generator via simulated conditions or overwritten values.
4. Altering Setpoints: Rather than overwriting sensor values, and when simulating conditions is difficult, altering setpoints to test a sequence is acceptable. For example, to see the Air Conditioning compressor lockout initiate at an outside air temperature below 12 C (54 F), when the outside air temperature is above 12 C (54 F), temporarily change the lockout setpoint to be 2 C (4 F) above the current outside air temperature.
5. Indirect Indicators: Relying on indirect indicators for responses or performance shall be allowed only after visually and directly verifying and documenting, over the range of the tested parameters, that the indirect readings through the control system represent actual conditions and responses. Much of this verification shall be completed during systems startup and initial checkout.

F. Setup: Each function and test shall be performed under conditions that simulate actual conditions as closely as is practically possible. The Contractor shall provide all necessary materials, system modifications, etc. to produce the necessary flows, pressures, temperatures, etc. necessary to execute the test according to the specified conditions. At completion of the test, the Contractor shall return all affected building equipment and systems, due to these temporary modifications, to their pretest condition.

G. Sampling: No sampling is allowed in completing Pre-Functional Checklists. Sampling is allowed for Systems Functional Performance Test Procedures execution. The Commissioning Agent will determine the sampling rate. If at any point, frequent failures are occurring and testing is becoming more troubleshooting than verification, the Commissioning Agent may stop the testing and require the Contractor to perform and document a checkout of the remaining units, prior to continuing with Systems Functional Performance Testing of the remaining units.

- H. Cost of Retesting: The cost associated with expanded sample System Functional Performance Tests shall be solely the responsibility of the Contractor. Any required retesting by the Contractor shall not be considered a justified reason for a claim of delay or for a time extension by the Contractor.
- I. Coordination and Scheduling: The Contractor shall provide a minimum of 7 days notice to the Commissioning Agent and the VA regarding the completion schedule for the Pre-Functional Checklists and startup of all equipment and systems. The Commissioning Agent will schedule Systems Functional Performance Tests with the Contractor and VA. The Commissioning Agent will witness and document the Systems Functional Performance Testing of systems. The Contractor shall execute the tests in accordance with the Systems Functional Performance Test Procedure.
- J. Testing Prerequisites: In general, Systems Functional Performance Testing will be conducted only after Pre-Functional Checklists have been satisfactorily completed. The control system shall be sufficiently tested and approved by the Commissioning Agent and the VA before it is used to verify performance of other components or systems. The air balancing and water balancing shall be completed before Systems Functional Performance Testing of air-related or water-related equipment or systems are scheduled. Systems Functional Performance Testing will proceed from components to subsystems to systems. When the proper performance of all interacting individual systems has been achieved, the interface or coordinated responses between systems will be checked.
- K. Problem Solving: The Commissioning Agent will recommend solutions to problems found, however the burden of responsibility to solve, correct and retest problems is with the Contractor.

### 3.6 DOCUMENTATION, NONCONFORMANCE AND APPROVAL OF TESTS

- A. Documentation: The Commissioning Agent will witness, and document the results of all Systems Functional Performance Tests using the specific procedural forms developed by the Commissioning Agent for that purpose. Prior to testing, the Commissioning Agent will provide these forms to the VA and the Contractor for review and approval. The Contractor shall include the filled out forms with the O&M manual data.
- B. Nonconformance: The Commissioning Agent will record the results of the Systems Functional Performance Tests on the procedure or test form. All items of nonconformance issues will be noted and reported to the VA on Commissioning Field Reports and/or the Commissioning Master Issues Log.

1. Corrections of minor items of noncompliance identified may be made during the tests. In such cases, the item of noncompliance and resolution shall be documented on the Systems Functional Test Procedure.
2. Every effort shall be made to expedite the systems functional Performance Testing process and minimize unnecessary delays, while not compromising the integrity of the procedures. However, the Commissioning Agent shall not be pressured into overlooking noncompliant work or loosening acceptance criteria to satisfy scheduling or cost issues, unless there is an overriding reason to do so by direction from the VA.
3. As the Systems Functional Performance Tests progresses and an item of noncompliance is identified, the Commissioning Agent shall discuss the issue with the Contractor and the VA.
4. When there is no dispute on an item of noncompliance, and the Contractor accepts responsibility to correct it:
  - a. The Commissioning Agent will document the item of noncompliance and the Contractor's response and/or intentions. The Systems Functional Performance Test then continues or proceeds to another test or sequence. After the day's work is complete, the Commissioning Agent will submit a Commissioning Field Report to the VA. The Commissioning Agent will also note items of noncompliance and the Contractor's response in the Master Commissioning Issues Log. The Contractor shall correct the item of noncompliance and report completion to the VA and the Commissioning Agent.
  - b. The need for retesting will be determined by the Commissioning Agent. If retesting is required, the Commissioning Agent and the Contractor shall reschedule the test and the test shall be repeated.
5. If there is a dispute about item of noncompliance, regarding whether it is an item of noncompliance, or who is responsible:
  - a. The item of noncompliance shall be documented on the test form with the Contractor's response. The item of noncompliance with the Contractor's response shall also be reported on a Commissioning Field Report and on the Master Commissioning Issues Log.
  - b. Resolutions shall be made at the lowest management level possible. Other parties are brought into the discussions as needed. Final interpretive and acceptance authority is with the Department of Veterans Affairs.
  - c. The Commissioning Agent will document the resolution process.

d. Once the interpretation and resolution have been decided, the Contractor shall correct the item of noncompliance, report it to the Commissioning Agent. The requirement for retesting will be determined by the Commissioning Agent. If retesting is required, the Commissioning Agent and the Contractor shall reschedule the test. Retesting shall be repeated until satisfactory performance is achieved.

C. Cost of Retesting: The cost to retest a System Functional Performance Test shall be solely the responsibility of the Contractor. Any required retesting by the Contractor shall not be considered a justified reason for a claim of delay or for a time extension by the Contractor.

D. Approval: The Commissioning Agent will note each satisfactorily demonstrated function on the test form. Formal approval of the Systems Functional Performance Test shall be made later after review by the Commissioning Agent and by the VA. The Commissioning Agent will evaluate each test and report to the VA using a standard form. The VA will give final approval on each test using the same form, and provide signed copies to the Commissioning Agent and the Contractor.

### 3.7 DEFERRED TESTING

A. Unforeseen Deferred Systems Functional Performance Tests: If any Systems Functional Performance Test cannot be completed due to the building structure, required occupancy condition or other conditions, execution of the Systems Functional Performance Testing may be delayed upon approval of the VA. These Systems Functional Performance Tests shall be conducted in the same manner as the seasonal tests as soon as possible. Services of the Contractor to conduct these unforeseen Deferred Systems Functional Performance Tests shall be negotiated between the VA and the Contractor.

B. Deferred Seasonal Testing: Deferred Seasonal Systems Functional Performance Tests are those that must be deferred until weather conditions are closer to the systems design parameters. The Commissioning Agent will review systems parameters and recommend which Systems Functional Performance Tests should be deferred until weather conditions more closely match systems parameters. The Contractor shall review and comment on the proposed schedule for Deferred Seasonal Testing. The VA will review and approve the schedule for Deferred Seasonal Testing. Deferred Seasonal Systems Functional Performances Tests shall be witnessed and documented by the Commissioning Agent. Deferred Seasonal Systems Functional Performance Tests shall be executed by the Contractor in accordance with these specifications.

### 3.8 OPERATION AND MAINTENANCE TRAINING REQUIREMENTS

- A. Training Preparation Conference: Before operation and maintenance training, the Commissioning Agent will convene a training preparation conference to include VA's Resident Engineer, VA's Operations and Maintenance personnel, and the Contractor. The purpose of this conference will be to discuss and plan for Training and Demonstration of VA Operations and Maintenance personnel.
- B. The Contractor shall provide training and demonstration as required by other Division 21, Division 22, Division 23, Division 26, Division 27, Division 28, and Division 31 sections. The Training and Demonstration shall include, but is not limited to, the following:
1. Review the as-built construction documents.
  2. Review installed systems, subsystems, and equipment.
  5. Review training module outlines and contents.
  6. Review course materials (including operation and maintenance manuals).
  7. Review and discuss locations and other facilities required for instruction.
  8. Review and finalize training schedule and verify availability of educational materials, instructors, audiovisual equipment, and facilities needed to avoid delays.
  9. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.
- C. Training Module Submittals: The Contractor shall submit the following information to the VA and the Commissioning Agent:
1. Instruction Program: Submit two copies of outline of instructional program for demonstration and training, including a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module. At completion of training, submit two complete training manuals for VA's use.
  3. Attendance Record: For each training module, submit list of participants and length of instruction time.
- D. COORDINATION
1. Coordinate instruction schedule with VA's operations. Adjust schedule as required to minimize disrupting VA's operations.

2. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.
3. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by the VA.

E. INSTRUCTION PROGRAM

1. Program Structure: Develop an instruction program that includes individual training modules for each system and equipment not part of a system as follows:
  - a. Heat generation, including heating hot water heat exchangers, and heating hot water distribution piping.
  - b. Refrigeration systems, including chillers, cooling towers, condensers, pumps, and distribution piping.
  - c. HVAC systems, including air handling equipment, air distribution systems, and terminal equipment and devices.

F. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participants are expected to master. For each module, include instruction for the following:

1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
  - a. System, subsystem, and equipment descriptions.
  - b. Performance and design criteria if Contractor is delegated design responsibility.
  - c. Operating standards.
  - d. Regulatory requirements.
  - e. Equipment function.
  - f. Operating characteristics.
  - g. Limiting conditions.
  - h. Performance curves.
2. Documentation: Review the following items in detail:



- a. Emergency manuals.
  - b. Operations manuals.
  - c. Maintenance manuals.
  - d. Project Record Documents.
  - e. Identification systems.
  - f. Warranties and bonds.
  - g. Maintenance service agreements and similar continuing commitments.
3. Emergencies: Include the following, as applicable:
- a. Instructions on meaning of warnings, trouble indications, and error messages.
  - b. Instructions on stopping.
  - c. Shutdown instructions for each type of emergency.
  - d. Operating instructions for conditions outside of normal operating limits.
  - e. Sequences for electric or electronic systems.
  - f. Special operating instructions and procedures.
4. Operations: Include the following, as applicable:
- a. Startup procedures.
  - b. Equipment or system break-in procedures.
  - c. Routine and normal operating instructions.
  - d. Regulation and control procedures.
  - e. Control sequences.
  - f. Safety procedures.
  - g. Instructions on stopping.
  - h. Normal shutdown instructions.
  - i. Operating procedures for emergencies.
  - j. Operating procedures for system, subsystem, or equipment failure.

- k. Seasonal and weekend operating instructions.
  - l. Required sequences for electric or electronic systems.
  - m. Special operating instructions and procedures.
5. Adjustments: Include the following:
- a. Alignments.
  - b. Checking adjustments.
  - c. Noise and vibration adjustments.
  - d. Economy and efficiency adjustments.
6. Troubleshooting: Include the following:
- a. Diagnostic instructions.
  - b. Test and inspection procedures.
7. Maintenance: Include the following:
- a. Inspection procedures.
  - b. Types of cleaning agents to be used and methods of cleaning.
  - c. List of cleaning agents and methods of cleaning detrimental to product.
  - d. Procedures for routine cleaning
  - e. Procedures for preventive maintenance.
  - f. Procedures for routine maintenance.
  - g. Instruction on use of special tools.
8. Repairs: Include the following:
- a. Diagnosis instructions.
  - b. Repair instructions.
  - c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
  - d. Instructions for identifying parts and components.
  - e. Review of spare parts needed for operation and maintenance.

G. Training Execution:

1. Preparation: Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a combined training manual. Set up instructional equipment at instruction location.
2. Instruction:
  - a. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and Department of Veterans Affairs for number of participants, instruction times, and location.
  - b. Instructor: Engage qualified instructors to instruct VA's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
    - 1) The Commissioning Agent will furnish an instructor to describe basis of system design, operational requirements, criteria, and regulatory requirements.
    - 3) The VA will furnish the Contractor with names and positions of participants.
3. Scheduling: Provide instruction at mutually agreed times. For equipment that requires seasonal operation, provide similar instruction at start of each season. Schedule training with the VA and the Commissioning Agent with at least seven days' advance notice.

----- END -----

SECTION 23 08 00

COMMISSIONING OF HVAC SYSTEMS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. The requirements of this Section apply to all sections of Division 23.
- B. This project will have selected building systems commissioned. The complete list of equipment and systems to be commissioned are specified in Section 01 91 00 GENERAL COMMISSIONING REQUIREMENTS. The commissioning process, which the Contractor is responsible to execute, is defined in Section 01 91 00 GENERAL COMMISSIONING REQUIREMENTS. A Commissioning Agent (CxA) will be provided by the contractor and will manage the commissioning process.

## 1.2 RELATED WORK

- A. Section 01 00 00 GENERAL REQUIREMENTS.
- B. Section 01 91 00 GENERAL COMMISSIONING REQUIREMENTS.
- C. Section 01 33 23 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

## 1.3 SUMMARY

- A. This Section includes requirements for commissioning the HVAC systems, subsystems and equipment. This Section supplements the general requirements specified in Section 01 91 00 GENERAL COMMISSIONING REQUIREMENTS.
- B. The commissioning activities have been developed to support the VA requirements to meet guidelines for Federal Leadership in Environmental, Energy, and Economic Performance.
- C. Refer to Section 01 91 00 GENERAL COMMISSIONING REQUIREMENTS for more specifics regarding processes and procedures as well as roles and responsibilities for all Commissioning Team members.

## 1.4 DEFINITIONS

- A. Refer to Section 01 91 00 GENERAL COMMISSIONING REQUIREMENTS for definitions.

## 1.5 COMMISSIONED SYSTEMS

- A. Commissioning of a system or systems specified in this Division is part of the construction process. Documentation and testing of these systems, as well as training of the VA's Operation and Maintenance personnel, is required in cooperation with the VA and the Commissioning Agent.
- B. The following systems will be commissioned as part of this project:
  - 1. Facility exterior closure (Division 7 and Division 8)
    - a. Louvers and Vents
    - b. Sealants (Caulking, mechanical seals, and wind and vapor barriers)
  - 2. HVAC (Division 23)
    - a. Heating Hot Water Systems (heat exchangers, controls, instrumentation and gages, flues, heating water pumps and motors, Variable Speed Drives, mixing valves).
    - b. Condensate Return Systems (Condensate receivers and transfer pumps, motors, controls, pump alternator, alarms and instrumentation, safeties).

- c. Chilled Water Systems (Chilled water pumps and motors, Variable Speed Drives, chiller motor/compressor, controls, instrumentation and safeties, isolation valves, blending valves, side stream water cleaners/scrubbers/filters).
  - d. Condenser Water Systems for Chillers (Condenser water pumps and motors, Variable Speed Drives, cooling tower fans, cooling tower sump level controls, open-circuit water treatment system, water treatment injection pumps and motors, water treatment controls, cooling tower basin heaters and controls, side stream water cleaners/scrubbers/filters, tower bypass valves).
  - e. Exhaust Fans (Fan, motor, Variable Speed Drives, controls and safeties).
  - f. Steam System (controls, gages and instrumentation, safety relief valves).
  - g. Direct Digital Control System (BACnet or similar Local Area Network (LAN), Operator Work Station hardware and software, building controller hardware and software, terminal unit controller hardware and software, all sequences of operation, system accuracy and response time).
  - h. OR Air Handling Systems (Fans, motors, Variable Speed Drives, cooling coils and control valves, heating coils and control valves, filters, HEPA filter performance, dampers, safeties such as smoke detectors or freezestats and damper end switches, controls, gages, and vibration isolation).
  - i. Room Pressurization Equipment (Pressure sensors, terminal units/dampers, and controls and alarms).
3. Site Utility Systems (Division 31)
- a. Steam Condensate Pump Stations (Condensate receivers and transfer pumps, motors, controls, pump alternator, alarms and instrumentation, and safeties).  
Note: Commission only to the extent present in the surgical suite HVAC system.

#### 1.6 SUBMITTALS

- A. The commissioning process requires review of selected Submittals. The Commissioning Agent will provide a list of submittals that will be reviewed by the Commissioning Agent. This list will be reviewed and approved by the VA prior to forwarding to the Contractor. Refer to Section 01 33 23 SHOP DRAWINGS, PRODUCT DATA, and SAMPLES for further details.
- B. The commissioning process requires Submittal review simultaneously with engineering review. Specific submittal requirements related to the commissioning process are specified in Section 01 91 00 GENERAL COMMISSIONING REQUIREMENTS.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 PRE-FUNCTIONAL CHECKLISTS

- A. The Contractor shall complete Pre-Functional Checklists to verify systems, subsystems, and equipment installation is complete and systems are ready for Systems Functional Performance Testing. The Commissioning Agent will prepare Pre-Functional Checklists to be used to document equipment installation. The Contractor shall complete the checklists. Completed checklists shall be submitted to the VA and to the Commissioning Agent for review. The Commissioning Agent may spot check a sample of completed checklists. If the Commissioning Agent determines that the information provided on the checklist is not accurate, the Commissioning Agent will return the marked-up checklist to the Contractor for correction and resubmission. If the Commissioning Agent determines that a significant number of completed checklists for similar equipment are not accurate, the Commissioning Agent will select a broader sample of checklists for review. If the Commissioning Agent determines that a significant number of the broader sample of checklists is also inaccurate, all the checklists for the type of equipment will be returned to the Contractor for correction and resubmission. Refer to SECTION 01 91 00 GENERAL COMMISSIONING REQUIREMENTS for submittal requirements for Pre-Functional Checklists, Equipment Startup Reports, and other commissioning documents.

3.2 SYSTEMS FUNCTIONAL PERFORMANCE TESTING:

- A. The Commissioning Process includes Systems Functional Performance Testing that is intended to test systems functional performance under steady state conditions, to test system reaction to changes in operating conditions, and system performance under emergency conditions. The Commissioning Agent will prepare detailed Systems Functional Performance Test procedures for review and approval by the Resident Engineer. The Contractor shall provide the required labor, materials, and test equipment identified in the test procedure to perform the tests. The Commissioning Agent will witness and document the testing. The Contractor shall sign the test reports to verify tests were performed. See Section 01 91 00 GENERAL COMMISSIONING REQUIREMENTS, for additional details.

3.3 TRAINING OF VA PERSONNEL

- A. Training of the VA's operation and maintenance personnel is required in cooperation with the Resident Engineer and Commissioning Agent. Provide competent personnel to provide instruction to operation and maintenance personnel concerning the location, operation, and troubleshooting of the installed systems. The instruction shall be scheduled in coordination with the Resident Engineer after submission and approval of formal training plans. Refer to Section 01 91 00 GENERAL COMMISSIONING

REQUIREMENTS and Division 23 Sections for additional Contractor training requirements.

----- END -----

SECTION 23 05 93  
TESTING, ADJUSTING, AND BALANCING FOR HVAC

PART 1 - GENERAL

1.1 DESCRIPTION

A. Testing, adjusting, and balancing (TAB) of heating, ventilating and air conditioning (HVAC) systems. TAB includes the following:

1. Planning systematic TAB procedures.
2. Design Review Report.
3. Systems Inspection report.
4. Duct Air Leakage test report.
5. Systems Readiness Report.
6. Balancing air and water distribution systems; adjustment of total system to provide design performance; and testing performance of equipment and automatic controls.
7. Vibration and sound measurements.
8. Recording and reporting results.

B. Definitions:

1. Basic TAB used in this Section: Chapter 37, "Testing, Adjusting and Balancing" of 2007 ASHRAE Handbook, "HVAC Applications".
2. TAB: Testing, Adjusting and Balancing; the process of checking and adjusting HVAC systems to meet design objectives.
3. AABC: Associated Air Balance Council.
4. NEBB: National Environmental Balancing Bureau.
5. Hydronic Systems: Includes chilled water, condenser water, and heating hot water systems.
6. Air Systems: Includes all outside air, supply air, return air, exhaust air and relief air systems.

7. Flow rate tolerance: The allowable percentage variation, minus to plus, of actual flow rate from values (design) in the contract documents.

## 1.2 RELATED WORK

- A. Section 23 09 23, DIRECT-DIGITAL CONTROL SYSTEM FOR HVAC: Controls and Instrumentation Settings.
- B. Section 23 08 00, COMMISSIONING OF HVAC SYSTEMS. Requirements for commissioning, systems readiness checklists, and training

## 1.3 QUALITY ASSURANCE

- A. Refer to Articles, Quality Assurance and Submittals, in Section 23 08 00, COMMISSIONING OF HVAC SYSTEMS.

- B. Qualifications:

1. TAB Agency: The TAB agency shall be a subcontractor of the General Contractor and shall report to and be paid by the General Contractor.
2. The TAB agency shall be either a certified member of AABC or certified by the NEBB to perform TAB service for HVAC, water balancing and vibrations and sound testing of equipment. The certification shall be maintained for the entire duration of duties specified herein. If, for any reason, the agency loses subject certification during this period, the General Contractor shall immediately notify the Resident Engineer and submit another TAB firm for approval. Any agency that has been the subject of disciplinary action by either the AABC or the NEBB within the five years preceding Contract Award shall not be eligible to perform any work related to the TAB. All work performed in this Section and in other related Sections by the TAB agency shall be considered invalid if the TAB agency loses its certification prior to Contract completion, and the successor agency's review shows unsatisfactory work performed by the predecessor agency.
3. TAB Specialist: The TAB specialist shall be either a member of AABC or an experienced technician of the Agency certified by NEBB. The certification shall be maintained for the entire duration of duties specified herein. If, for any reason, the Specialist loses subject certification during this period, the General Contractor shall immediately notify the Resident Engineer and submit another TAB Specialist for approval. Any individual that has been the subject of disciplinary action by either the AABC or the NEBB within the five years preceding Contract Award shall not be eligible to perform any duties related to the HVAC systems, including TAB. All work specified in this Section and in other related Sections performed by the TAB specialist shall be considered invalid if



the TAB Specialist loses its certification prior to Contract completion and must be performed by an approved successor.

4. TAB Specialist shall be identified by the General Contractor within 60 days after the notice to proceed. The TAB specialist will be coordinating, scheduling and reporting all TAB work and related activities and will provide necessary information as required by the Resident Engineer. The responsibilities would specifically include:

- a. Shall directly supervise all TAB work.
- b. Shall sign the TAB reports that bear the seal of the TAB standard. The reports shall be accompanied by report forms and schematic drawings required by the TAB standard, AABC or NEBB.
- c. Would follow all TAB work through its satisfactory completion.
- d. Shall provide final markings of settings of all HVAC adjustment devices.
- e. Permanently mark location of duct test ports.

5. All TAB technicians performing actual TAB work shall be experienced and must have done satisfactory work on a minimum of 3 projects comparable in size and complexity to this project. Qualifications must be certified by the TAB agency in writing. The lead technician shall be certified by AABC or NEBB

C. Test Equipment Criteria: The instrumentation shall meet the accuracy/calibration requirements established by AABC National Standards or by NEBB Procedural Standards for Testing, Adjusting and Balancing of Environmental Systems and instrument manufacturer. Provide calibration history of the instruments to be used for test and balance purpose.

D. Tab Criteria:

1. One or more of the applicable AABC, NEBB or SMACNA publications, supplemented by ASHRAE Handbook "HVAC Applications" Chapter 36, and requirements stated herein shall be the basis for planning, procedures, and reports.
2. Flow rate tolerance: Following tolerances are allowed. For tolerances not mentioned herein follow ASHRAE Handbook "HVAC Applications", Chapter 36, as a guideline. Air Filter resistance during tests, artificially imposed if necessary, shall be at least 100 percent of manufacturer recommended change over pressure drop values for pre-filters and after-filters.

- a. Air handling unit and all other fans, cubic meters/min (cubic feet per minute): Minus 0 percent to plus 10 percent.
  - b. Air terminal units (maximum values): Minus 2 percent to plus 10 percent.
  - c. Exhaust hoods/cabinets: 0 percent to plus 10 percent.
  - d. Minimum outside air: 0 percent to plus 10 percent.
  - e. Individual room air outlets and inlets, and air flow rates not mentioned above: Minus 5 percent to plus 10 percent except if the air to a space is 100 CFM or less the tolerance would be minus 5 to plus 5 percent.
  - f. Heating hot water pumps and hot water coils: Minus 5 percent to plus 5 percent.
  - g. Chilled water and condenser water pumps: Minus 0 percent to plus 5 percent.
  - h. Chilled water coils: Minus 0 percent to plus 5 percent.
- 3. Systems shall be adjusted for energy efficient operation as described in PART 3.
  - 4. Typical TAB procedures and results shall be demonstrated to the Resident Engineer for one air distribution system (including all fans, three terminal units, three rooms randomly selected by the Resident Engineer) and one hydronic system (pumps and three coils) as follows:
    - a. When field TAB work begins.
    - b. During each partial final inspection and the final inspection for the project if requested by VA.

#### 1.4 SUBMITTALS

- A. Submit names and qualifications of TAB agency and TAB specialists within 60 days after the notice to proceed. Submit information on three recently completed projects and a list of proposed test equipment.
- B. For use by the Resident Engineer staff, submit one complete set of applicable AABC or NEBB publications that will be the basis of TAB work.
- C. Submit Following for Review and Approval:
  - 1. Design Review Report
  - 2. Systems inspection report on equipment and installation for conformance with design.

3. Duct Air Leakage Test Report.

4. Systems Readiness Report.

5. Intermediate and Final TAB reports covering flow balance and adjustments, performance tests, vibration tests and sound tests.

6. Include in final reports uncorrected installation deficiencies noted during TAB and applicable explanatory comments on test results that differ from design requirements.

D. Prior to request for Final or Partial Final inspection, submit completed Test and Balance report for the area.

#### 1.5 APPLICABLE PUBLICATIONS

A. The following publications form a part of this specification to the extent indicated by the reference thereto. In text the publications are referenced to by the acronym of the organization.

B. American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc. (ASHRAE):

2007 .....HVAC Applications ASHRAE Handbook, Chapter 37, Testing, Adjusting, and Balancing and Chapter 47, Sound and Vibration Control

C. Associated Air Balance Council (AABC):

2002.....AABC National Standards for Total System Balance

D. National Environmental Balancing Bureau (NEBB):

7<sup>th</sup> Edition 2005 .....Procedural Standards for Testing, Adjusting, Balancing of Environmental Systems

2nd Edition 2006 .....Procedural Standards for the Measurement of Sound and Vibration

3<sup>rd</sup> Edition 2009 .....Procedural Standards for Whole Building Systems Commissioning of New Construction

E. Sheet Metal and Air Conditioning Contractors National Association (SMACNA):

3<sup>rd</sup> Edition 2002 .....HVAC SYSTEMS Testing, Adjusting and Balancing

## PART 2 - PRODUCTS

### 2.1 PLUGS

Provide plastic plugs to seal holes drilled in ductwork for test purposes.

### 2.2 INSULATION REPAIR MATERIAL

See Section 23 07 11, HVAC and BOILER PLANT INSULATION Provide for repair of insulation removed or damaged for TAB work.

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. Refer to TAB Criteria in Article, Quality Assurance.
- B. Obtain applicable contract documents and copies of approved submittals for HVAC equipment and automatic control systems.

### 3.2 DESIGN REVIEW REPORT

The TAB Specialist shall review the Contract Plans and specifications and advise the Resident Engineer of any design deficiencies that would prevent the HVAC systems from effectively operating in accordance with the sequence of operation specified or prevent the effective and accurate TAB of the system. The TAB Specialist shall provide a report individually listing each deficiency and the corresponding proposed corrective action necessary for proper system operation.

### 3.3 SYSTEMS INSPECTION REPORT

- A. Inspect equipment and installation for conformance with design.
- B. The inspection and report is to be done after air distribution equipment is on site and duct installation has begun, but well in advance of performance testing and balancing work. The purpose of the inspection is to identify and report deviations from design and ensure that systems will be ready for TAB at the appropriate time.
- C. Reports: Follow check list format developed by AABC, NEBB or SMACNA, supplemented by narrative comments, with emphasis on air handling units and fans. Check for conformance with submittals. Verify that diffuser and register sizes are correct. Check air terminal unit installation including their duct sizes and routing.

### 3.4 DUCT AIR LEAKAGE TEST REPORT

TAB Agency shall perform the leakage test as outlined in SMACNA Leakage Test manual.

### 3.5 SYSTEM READINESS REPORT

- A. Inspect each System to ensure that it is complete including installation and operation of controls. Submit report to RE in standard format and forms prepared and or approved by the Commissioning Agent.
- B. Verify that all items such as ductwork piping, ports, terminals, connectors, etc., that is required for TAB are installed. Provide a report to the Resident Engineer.

### 3.6 TAB REPORTS

- A. The TAB contractor shall provide raw data immediately in writing to the Resident Engineer if there is a problem in achieving intended results before submitting a formal report.
- B. If over 20 percent of readings in the intermediate report fall outside the acceptable range, the TAB report shall be considered invalid and all contract TAB work shall be repeated and re-submitted for approval at no additional cost to the owner.

### 3.7 TAB PROCEDURES

- A. Tab shall be performed in accordance with the requirement of the Standard under which TAB agency is certified by either AABC or NEBB.
- B. General: During TAB all related system components shall be in full operation. Fan and pump rotation, motor loads and equipment vibration shall be checked and corrected as necessary before proceeding with TAB. Set controls and/or block off parts of distribution systems to simulate design operation of variable volume air or water systems for test and balance work.
- C. Allow time in construction schedule for TAB and submission of all reports for an organized and timely correction of deficiencies.
- D. Air Balance and Equipment Test: Include air handling units, fans, terminal units, fan coil units, room diffusers/outlets/inlets.
  - 1. Artificially load air filters by partial blanking to produce air pressure drop of manufacturer's recommended pressure drop.
  - 2. Adjust fan speeds to provide design air flow.
  - 3. Test and balance systems in all specified modes of operation, including occupied, unoccupied, variable volume, economizer, and fire emergency modes. Verify that dampers and other controls function properly.
  - 4. Variable air volume (VAV) systems:

- a. Coordinate TAB, including system volumetric controls, with Section 23 09 23, DIRECT-DIGITAL CONTROL SYSTEM FOR HVAC.
  - b. Balance air distribution from air terminal units (ATU) on full cooling maximum scheduled cubic meters per minute (cubic feet per minute). Reset room thermostats and check ATU operation from maximum to minimum cooling, to the heating mode, and back to cooling. Record and report the heating coil leaving air temperature when the ATU is in the maximum heating mode. Record and report outdoor air flow rates under all operating conditions (The test shall demonstrate that the minimum outdoor air ventilation rate shall remain constant under all operating conditions).
  - c. Adjust operating pressure control setpoint to maintain the design flow to each space with the lowest setpoint.
5. Record final measurements for air handling equipment performance data sheets.
- E. Water Balance and Equipment Test: Include circulating pumps, convertors, coils, coolers and condensers:
1. Adjust flow rates for equipment. Set coils and evaporator to values on equipment submittals, if different from values on contract drawings.
  2. Primary-secondary (variable volume) systems: Coordinate TAB with Section 23 09 23, DIRECT-DIGITAL CONTROL SYSTEM FOR HVAC. Balance systems at design water flow and then verify that variable flow controls function as designed.
  3. Record final measurements for hydronic equipment on performance data sheets. Include entering and leaving water temperatures for heating and cooling coils, and for convertors. Include entering and leaving air temperatures (DB/WB for cooling coils) for air handling units and reheat coils. Make air and water temperature measurements at the same time.

### 3.10 MARKING OF SETTINGS

Following approval of Tab final Report, the setting of all HVAC adjustment devices including valves, splitters and dampers shall be permanently marked by the TAB Specialist so that adjustment can be restored if disturbed at any time. Style and colors used for markings shall be coordinated with the Resident Engineer.

### 3.11 IDENTIFICATION OF TEST PORTS

The TAB Specialist shall permanently and legibly identify the location points of duct test ports. If the ductwork has exterior insulation, the identification shall be made on the exterior side of the insulation. All penetrations through ductwork

and ductwork insulation shall be sealed to prevent air leaks and maintain integrity of vapor barrier.

### 3.12 PHASING

- A. Phased Projects: Testing and Balancing Work to follow project with areas shall be completed per the project phasing. Upon completion of the project all areas shall have been tested and balanced per the contract documents.
- B. Existing Areas: Systems that serve areas outside of the project scope shall not be adversely affected. Measure existing parameters where shown to document system capacity.

### 3.13 COMMISSIONING

- A. Provide commissioning documentation in accordance with the requirements of Section 23 08 00 - COMMISSIONING OF HVAC SYSTEMS for all inspection, start up, and contractor testing required above and required by the System Readiness Checklist provided by the Commissioning Agent.
- B. Components provided under this section of the specification will be tested as part of a larger system. Refer to Section 23 08 00 - COMMISSIONING OF HVAC SYSTEMS and related sections for contractor responsibilities for system commissioning.

- - E N D - - -

## 4.31 Attachments

See attached document: S02 Combined\_Drawings Compressed.

See attached document: S02 Attachment Surgery Final Test\_Balance.

See attached document: S02 Attachment Functional Performance Test \_DRAFT.