PHASE TWO

THIS PROJECT IS ADVERTISED ON AN UNRESTRICTED BASIS

SOLICITATION NO: **W91278-17-R-0002**
CADD CODE: **MB16ET47**

65% SUBMITTAL - SPECIFICATIONS

FOR

TWO-PHASE DESIGN/BUILD
OF
PROJECT NUMBER VA-0007-2016

NEW BED TOWER
JAMES A. HALEY VETERANS' HOSPITAL

TAMPA, FLORIDA
(HILLSBOROUGH COUNTY)

US Army Corps of Engineers ®
Mobile District

U.S. ARMY ENGINEER DISTRICT, MOBILE
109 St. Joseph St
Mobile, Alabama 36602

LEADERS IN CUSTOMER CARE
U.S. ARMY CORPS OF ENGINEERS
WE CARE FOR THOSE WE SERVE
MOBILE DISTRICT

"BUILDING STRONG®"

Note: This is a Two-Phase solicitation. One solicitation has been issued covering both phases. Proposals were evaluated in Phase One to determine which offerors will submit proposals for Phase Two. This amendment incorporates the detailed project design requirements to the solicitation for the Phase Two stage of the Request For Proposals. Technical specifications and drawings are included herein. A limited number of firms were selected to participate in the second phase, and this amendment will be issued only to those selected offerors.

REPLACED BY AMENDMENT NO. W91278-17-R-0002-00XX

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SECTION 01 00 00

ADDITIONAL SPECIAL CONTRACT REQUIREMENTS

PART 1 GENERAL

1.1 COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK

(a) Commence design under this portion of the contract within 8 calendar days after the date the Contractor receives the notice to proceed.

(b) The entire design and construction of the facility shall be completed and ready for use not later than the calendar days indicated on the SF 1442 Solicitation, Offer, and Award Form, block 11, after the receipt of the notice to proceed. This time stated for completion shall include final cleanup of the premises. Provisions stipulated for conducting tests on heating and air conditioning systems and planting and maintenance of grass are excluded from the completion time.

(c) The time required for the Government to review the design submittals, attend review conferences, and the Contractor to incorporate review comments as specified in specification Section 01 10 12 entitled Design After Award, paragraph: "Design Schedule", will be included in the calendar days, indicated on the SF 1442 Solicitation, Offer, and Award Form, block 11.

1.2 LIQUIDATED DAMAGES--CONSTRUCTION

(a) If the Contractor fails to complete the work within the time specified in the contract, the Contractor shall pay liquidated damages to the Government in the amount of **$7,110.00** for each calendar day of delay until the work is completed or accepted.

(b) If the Government terminates the Contractor's right to proceed, liquidated damages will continue to accrue until the work is completed. These liquidated damages are in addition to excess costs of repurchase under the Termination clause.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Hazard Analysis; G, SO.

Written request for construction trailer site and material lay-down area; G, CD

SD-02 Shop Drawings

Protective Fence; G, CD

SD-07 Certificates

Request for Road Closures; G, CD.

Request Use of Cranes; G, CD.

Request for Interruption of Utility Services; G, CD.

Asbestos and Lead Based Paint Certification Letter; G, CD

1.4 CONTRACT DRAWINGS, MAPS AND SPECIFICATIONS

(a) The Contractor will be furnished one CD-ROM containing a reproducible copy of the advertised solicitation, including contract clauses, plans and specifications. The Contractor shall provide construction 2D plans, BIM models, specifications, shop drawings, RFI's, change order requests, and other information required to do the work in and organized, electronic form to all parties necessary to execute the construction work. The AE's design work shall be created, organized in accordance with the BIM Guide from the VA TIL (Technical Information Library) http://cfm.va.gov/til/bim/BIMguide/. The process for delineating and tracking the design and construction documents from the inception to as-built delivery is defined by http://www.sam.usace.army.mil/sam/en/guides/DesMan/desman.htm.

(b) The work shall conform to the specifications and the contract drawings listed in the technical provisions.

(c) The Government requires the Contractor to use BIM technology and Lean construction management practices throughout design and construction to enable better communications, scheduling, cost management, and other efficiencies to achieve better project outcomes.

(d) The Contractor shall assure that sufficient access to the building systems, such as fire dampers and fire-smoke dampers, and major building and medical equipment for maintenance, testing, and replacement, along with space reservations for tools, access, personnel, and defined interior pathways for removal and replacement of major equipment, is modeled and constructed as space reservation zones as described in the BIM Standards. The contractor shall assure that all design and trade coordination is done in BIM before placement in the field and that placement follows the location in the coordinated model.

(e) Omissions from the drawings or specifications, the mis-description of details of work which are manifestly necessary to carry out the intent of the drawings and specifications which are customarily performed shall not relieve the Contractor from performing such omitted or mis-described details of the work but they shall be performed as if fully and correctly set forth and described in the drawings and specifications.

(f) The Contractor shall maintain electronic Building Information Model(s)(BIM) that reflect the current state of changes during the design and construction of the project, to include all contract changes, modifications, clarifications, commissioning, and shop drawings as they are requested and approved.

(g) The Contractor shall check all drawings furnished him immediately upon their receipt and shall promptly notify the Contracting Officer's Representative of any discrepancies. Figures marked on drawings shall in general be followed in preference to scale measurements. Large scale drawings shall in general govern small scale drawings. The Contractor shall compare all drawings and verify the figures before laying out the work and will be responsible for any errors which might have been avoided thereby.

(h) The list of drawings and maps provided in the Index Sheet of the Plans for this solicitation are hereby incorporated by reference into these specifications. Any schedules included in the drawings are for the purpose of defining requirements other than quantities.

(i) The Contractor shall provide a common internet design/construction data sharing platform that meets the government standard for security for the project and require the trade contractors and other stakeholders to use it for work and communication activities. Project information shall be provided by the Contractor to project stakeholders in real time to assure timely integration and efficiency of work effort. Government Resident Engineer(s) shall be provided access to this system. The Contractor shall provide construction grade iPads or similar devices during project duration for use by appropriate field workers, the government Resident Engineers(s), commissioning agents, and others as necessary to integrate real time data gathering and progress reporting for the project

NOTE: Refer to the folio of drawings for the index of drawings in this solicitation.

1.5 HAZARD ANALYSIS

(refer to Section 00800, paragraph 952.000-4329)

1.6 PHYSICAL DATA

(a) Data and information furnished or referred to below is for the Contractor's information. The Government shall not be responsible for any interpretation of or conclusion drawn from the data or information by the Contractor. The indications of physical conditions on the drawings and in the specifications are the result of site investigations by surveys. The Government does not guarantee that other materials will not be encountered nor that proportions, conditions or character of several materials will not vary from those indicated by explorations. Bidders are expected to examine site of work and logs of borings; and, after investigation, decide for themselves character of materials and make their bids accordingly. Upon proper application to US Army Corp of Engineers, bidders will be permitted to make subsurface explorations of their own at site.

(b) Weather Conditions. The area is subject to tropical hurricanes from July to November. Good weather, insofar as temperature is concerned, generally prevails throughout the year; however, freezing temperatures can be expected occasionally during the winter months. Complete data are published by the U. S. Department of Commerce under the title Climatological Data, Florida. Additional data may be obtained by writing to: State Climatologist, P. O. Box 3653, University Station, Gainesville, Florida or by contacting the weather unit at James A Haley Veterans'

Hospital, Florida. A review of the weather data from the above referenced sources reveals that considerable variation in precipitation may be expected throughout the year. Also, gale force winds can be expected during any month and commonly occur in the vicinity of local thunderstorms.

(c) Transportation facilities. The Medical Center is located in the northeast of Tampa approximately 18 miles from Tampa International Airport, and is served by U.S. Interstate 275.

1.7 TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER

(a) This provision specifies the procedure for determination of time extensions for unusually severe weather in accordance with the contract clause entitled "Default: (Fixed Price Construction)". In order for the Contracting Officer to award a time extension under this clause, the following conditions must be satisfied:

(1) The weather experienced at the project site during the contract period must be found to be unusually severe, that is, more severe than the adverse weather anticipated for the project location during any given month.

(2) The unusually severe weather must actually cause a delay to the completion of the project. The delay must be beyond the control and without the fault or negligence of the Contractor.

(b) The following schedule of monthly anticipated adverse weather delays is based on National Oceanic and Atmospheric Administration (NOAA) or similar data for the project location and will constitute the base line for monthly weather time evaluations. The Contractor's progress schedule must reflect these anticipated adverse weather delays in all weather dependent activities.

MONTHLY ANTICIPATED ADVERSE WEATHER DELAY
WORK DAYS BASED ON (5) DAY WORK WEEK

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
3	4	5	3	4	5	5	5	5	5	5	3

(c) Upon acknowledgment of the Notice to Proceed (NTP) and continuing throughout the contract, the Contractor will record on the daily CQC report, the occurrence of adverse weather and resultant impact to normally schedule work. Actual adverse weather delay days must prevent work on critical activities for 50 percent or more of the Contractor's scheduled work day.

(d) The number of actual adverse weather delay days shall include days impacted by actual adverse weather (even if adverse weather occurred in previous month), be calculated chronologically from the first to the last day of each month, and be recorded as full days. If the number of actual adverse weather delay days exceeds the number of days anticipated in paragraph 2, above, the Contracting Officer will convert any qualifying delays to calendar days, giving full consideration for equivalent fair weather work days, and issue a modification in accordance with the Contract Clause entitled "Default (Fixed Price Construction)".

1.8 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 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) Contractor's employees may be subject to inspection of their personal effects when entering or leaving the project site. Contractor to implement and monitor control system.

(2) Regular working hours shall consist of a 12 hour period between 7:00 a.m. and 7:00 p.m., Monday through Friday, excluding Government holidays.

(3) For working outside the "regular hours" as defined in the contract, The Contractor shall give 3 days notice to the Contracting Officer so that security arrangement can be provided for the employees. This notice is separate from any notices required for utility shutdown described later in this section.

(4) No photography of VA premises is allowed without written permission of the Contracting Officer.

(5) USACE reserves the right to close down or shut down the project site and order Contractor's employees off the premises in the event of a national emergency. The Contractor may return to the site only with the written approval of the Contracting Officer.

(6) Furnish a list of contact personnel of the Contractor and subcontractors including addresses and telephone numbers for use in the event of an emergency. As changes occur and additional information becomes available, correct and change the information contained in previous lists.

(c) Guards: Contractor must ensure site is secure from access by unauthorized persons at all times for the entire duration of the contract.

(d) Key Control:

(1) The Contractor shall provide duplicate keys and lock combinations to the Resident Engineer for the purpose of security inspections of every area of project including tool boxes and parked machines and take any emergency action.

(2) The Contractor shall turn over all permanent lock cylinders to the VA locksmith for permanent installation. See Section 08 71 00, DOOR HARDWARE and coordinate.

(e) Document Control:

(1) Before starting any work, the Contractor shall submit an electronic security memorandum describing the approach to following goals and maintaining confidentiality of "sensitive information".

(2) The Contractor is responsible for safekeeping of all drawings, project manual and other project information. This information shall be shared

only with those with a specific need to accomplish the project.

(3) Certain documents, sketches, videos or photographs and drawings may be marked "Law Enforcement Sensitive" or "Sensitive Unclassified". Secure such information in separate containers and limit the access to only those who will need it for the project. Return the information to the Contracting Officer upon request during the project and return to the COR at the end of the project.

(4) These security documents shall not be removed or transmitted from the project site without the written approval of Contracting Officer.

(5) All paper waste or electronic media such as CD's and diskettes shall be shredded and destroyed in a manner acceptable to the USACE COR.

(6) Notify Contracting Officer and Site Security Officer immediately when there is a loss or compromise of "sensitive information".

(7) All electronic information shall be stored in specified location using an Engineering Document Management Software (EDMS). Security, access and maintenance of all project drawings, both scanned and electronic shall be performed and tracked through the EDMS system. "Sensitive information" including drawings and other documents may be attached to e-mail provided all USACE encryption procedures are followed. USACE utilizes PKI encryption technology.

(8) All Design Documents maintained on a computer network, shall be maintained behind a hardware firewall system. The system shall be design to prevent unauthorized access to restricted project data. No document shall be transmitted from the network in plain text. Plain text document transmission shall be by either FedEX, UPS, USPS or other approved ground transport. The only approved means of electronic transmission for this contract shall utilize a minimum 128-bit encryption. The encryption shall be either 128-bit Secure Socket Link (SSL) or DOD approved encryption software. The 128 -bit SSL access shall meet the security requirements of ISO/IEC/ITU X.509.

(f) Motor Vehicle Restrictions: Prior to commencing work, the Contractor shall provide the Resident Engineer a plan describing the means for control of vehicle access to/from the site and for control of parking by Contractor and its employees and that of its subcontractors.

(g) Perimeter Security: Contractor must ensure site is secure from access by unauthorized persons at all times for the entire duration of the contract.

1.9 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
70-2014	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 Resident Engineer and Facility Safety Officer for review for compliance with contract requirements in accordance with Section 01 33 00, Submittal Procedures for Design Build. Prior to any worker for the contractor or subcontractors beginning work, they shall undergo a safety briefing provided by the contractor's competent person per OSHA requirements. This briefing shall include information required by Appendix A, multiple Medical Center sub sections 01 14 00.05.20 on the construction limits, Medical Center safety guidelines, means of egress, break areas, work hours, locations of restrooms, etc. Documentation shall be provided to the Resident Engineer 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 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 Heating and Electrical: Install, use and maintain installations in accordance with 29 CFR 1926, NFPA 241 and NFPA 70.

(f) Egress Routes for Construction Workers: Maintain free and unobstructed egress. Inspect daily. Report findings and corrective actions weekly to Resident Engineer and Facility Safety Officer.

(g) Fire Extinguishers: Provide and maintain extinguishers in construction areas and temporary storage areas in accordance with 29 CFR 1926, NFPA 241 and NFPA 10.

(h) Flammable and Combustible Liquids: Store, dispense and use liquids in accordance with 29 CFR 1926, NFPA 241 and NFPA 30.

(i) Standpipes: Install and extend standpipes up with each floor in accordance with 29 CFR 1926 and NFPA 241. Do not charge wet standpipes subject to freezing until weather protected.

(j) Smoke Detectors: Prevent accidental operation. Remove temporary covers at end of work operations each day. Coordinate with Resident Engineer and Facility Safety Officer.

(k) Hot Work: Perform and safeguard hot work operations in accordance with NFPA 241 and NFPA 51B. Coordinate with Resident Engineer. Designate contractor's responsible project-site fire prevention program manager to permit hot work. For any work in occupied spaces, complete Medical Center Hot Work Permit and Fire Safety Check Lists (refer to Appendix A, multiple sub-sections of 01 14 00.05 20), and submit to the Resident Engineer at

least 24 hours (business day) prior to work.

(l) Fire Hazard Prevention and Safety Inspections: Inspect entire construction areas weekly. Coordinate with, and report findings and corrective actions weekly to Resident Engineer and Facility Safety Officer.

(m) Smoking: Smoking is prohibited in and adjacent to construction areas. Smoking is prohibited except in designated smoking areas.

(n) Dispose of waste and debris in accordance with NFPA 241. Remove from buildings daily.

(o) Perform other construction, and demolition operations in accordance with 29 CFR 1926.

(p) If required, submit documentation to the Resident Engineer that personnel have been trained in the fire safety aspects of working in areas with impaired structural or compartmentalization features.

1.10 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 without any additional cost to the Government.

(d) Working space and space available for storing materials shall be as shown on the drawings or otherwise approved by the Resident Engineer.

(e) Workmen are subject to rules of the Medical Center applicable to their conduct.

(f) Execute work in such a manner 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. Keep roads clear of construction materials, debris, standing construction equipment and vehicles at all

times. 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 Resident Engineer.

(g) Utilities Services: Where necessary to cut existing pipes, electrical wires, conduits, cables, etc., of utility services, or of fire protection systems or communications systems, they shall be cut and capped at suitable places where shown; or, in absence of such indication, where directed by Resident Engineer. All such actions shall be coordinated with the Resident Engineer and Utility Company involved:

(1) 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.

(2) Make utility cutovers and interruptions after normal working hours or on Saturdays, Sundays, and Government holidays. Conform to procedures required in the paragraph for work outside Regular Hours. Ensure that new utility lines are complete, except for the connection, before interrupting existing service.

(3) Operation of Station Utilities: The Contractor shall not operate nor disturb the setting of control devices in the station utilities system, including water, sewer, and electrical, etc.

(4) All work on existing and new electrical systems shall be done de-energized.

(h) Phasing: The Medical Center must maintain its operation 24 hours a day 7 days a week. Therefore, any interruption in service must be scheduled and coordinated with the Resident Engineer, utility providers and operations & Maintenance personnel than must be present to ensure that no lapses in operation occur. It is the Contractor's responsibility to develop a work plan and schedule detailing, at a minimum, the procedures to be employed, the equipment and materials to be used, the interim life safety measure to be used during the work, and a schedule defining the duration of the work with milestone subtasks. The work to be outlined shall include, but not be limited to:

(1) To insure such executions, Contractor shall furnish the Resident Engineer with a schedule of approximate dates on which the Contractor intends to accomplish work in each specific area of site, occupied building or portion thereof. In addition, Contractor shall notify the Resident Engineer two weeks in advance of the proposed date of starting work in each specific area of site, occupied building or portion thereof. Arrange such phasing dates to insure accomplishment of this work in successive phases mutually agreeable to Resident Engineer, Medical Center, O&M personnel, and Contractor.

(2) Those area(s) designated as being jointly occupied means that the Contractor will be able to complete the work necessary in the building(s), room(s), or area(s) designated in the particular phase while remaining occupied by VA personnel and/or VA patients. The Contractor shall, in jointly occupied area(s), protect VA personnel/patients, existing equipment air flow and HVAC from hazards of dust, materials, tools, etc., associated with a construction environment. The Contractor shall keep these jointly occupied area(s) clear, clean and free of loose debris, construction

material partially installed work which would create a safety hazard or pay particular attention to leaving these jointly occupied area(s) clean at the end of each work shift.

(3) Those area(s) designated as being vacated area(s) means that the Contractor will be able to complete the work necessary in the building(s), room(s), or area(s) designated in a particular phase, without the presence of VA personnel and/or patients. In area(s) of limited work, the Contractor shall protect existing equipment from the hazards of dust, materials, tools, etc associated with a construction environment.

(4) Those area(s) designated as being completed on a room by room basis means that the Contractor will be allowed to complete the work necessary in that room, whether the particular room is a "jointly occupied area" or a "vacated area" and that all work in that particular room must be completed in full and accepted by the VA prior to starting work in another room so designated in that particular phase.

(5) Those area(s) designated as being worked after normal hours means that the Contractor will be able to perform the work necessary in the building(s), room(s), or area(s) designated in a particular phase, only during the hours that the VA considers to be other than their normal hours. Normal hours are 7:00 am to 5:00 pm. The Contractor must allow enough time at the end of each shift to clean and return the area(s) back to the station prior to the start of the station's normal hours of operation. Existing equipment airflow and HVAC in the area(s) shall be protected from the hazards of dust, materials, tools, etc., associated a construction restraint(s).

(6) Location of trash chutes, and cranes shall be coordinated with the Resident Engineer. The Contractor shall provide, install, reinstall, modify, repair and maintain construction fences and gates, (seven foot minimum height), at staging areas for the duration of the project.

(7) The Contractor shall notify the Resident Engineer a minimum of 14 calendar days prior to mobilizing or demobilizing heavy construction equipment. Movements of heavy construction equipment shall be coordinated with the Resident Engineer.

(8) The Contractor shall provide access to the staging area and work sites for authorized VAMC personnel at all times.

(9) Contractor shall be responsible for the security of materials and equipment stored in the staging area and the work sites. The Contractor shall provide his own security service to protect materials and equipment. The Government will not pay for stolen materials or equipment.

(i) Construction Fence: Before construction operations begin, Contractor shall provide temporary non-transparent chain link construction fence, 2.1m (seven feet) minimum height, around the construction area. Provide gates as required for access with necessary hardware, including hasps and padlocks. Remove the fence when directed by Resident Engineer.

(j) When a building or area is turned over to Contractor, Contractor shall accept entire responsibility thereof.

(1) Contractor shall maintain a minimum temperature of 4 degrees C (40 degrees F) at all times in buildings, 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.

(k) Coordinate the work for this contract with other construction operations as directed by Resident Engineer. This includes the scheduling of traffic and the use of roadways, as specified in Article, USE OF ROADWAYS.

1.11 ALTERATIONS

(a) Survey: Before any work is started, the Contractor shall make a thorough survey with the Resident Engineer and a representative of VAMC of buildings or areas of buildings in which alterations occur and areas which are anticipated routes of access, and furnish a report to the Contracting Officer. This report shall list existing conditions.

(b) 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. Any damages must be required at the Contractor's expense at no additional cost to the Government.

(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.

1.12 WORKER BADGING

(a) The badging procedures specified herein are subject to change. It is the responsibility of the contractor to provide their own physical security and to provide badges for their own employees. Refer to Appendix A - Work Restrictions Document for information on ID Badge restrictions.
(b) Badge Control and Accountability

The prime Contractor shall be accountable for all badges issued during the performance of this contract.

(c) Safeguarding Badges

All badges issued by Contractor shall be protected at all times. Badges must not be left unattended in vehicles on or off project site.

(d) Reporting Lost Badges

Lost badges must be reported to COR within 24 hours.

1.13 INFECTION PREVENTION MEASURES

Refer to section 01 35 26, Government Safety Requirements for safety and infection control requirements.

1.14 ROAD CLOSURES

Planned road closures shall be detailed and coordinated by the Contractor. Requests for road closures shall be submitted in writing by the Contractor to the Contracting Officer's Representative at least 22 (twenty two) working days before the planned closure. When it becomes necessary to close roads for construction, the contractor shall immediately put in place the necessary signs and barricades required. All traffic control devices (signs, barricades, pavement markings, traffic signals, intersection control beacons, delineators, etc.) shall conform to the FHWA Manual on Uniform Traffic Control Devices and the FHWA publication Standard Highway Signs, most current edition. These include but are not limited to begin/end construction signs, standard traffic control signs including clearly marked detours and barricades with yellow flashing caution lights. Hand painted plywood signs (or other materials) are not allowed or acceptable. Upon completion of road work, all signs and barricades shall be immediately removed and all normal traffic control devices and signs returned to their original condition. Signs and barricades shall not be left along sides of roadways.

1.15 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) Clean and store such items where reserved items which are to remain property of the Government are identified by attached tags 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 Resident Engineer.

(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 which are NOT required to be either relocated or reused will be removed by the Government in advance of work to avoid interfering with Contractor's operation.

1.16 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 does 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 (FAR 52.236 9).

(c) Refer to Section 01 74 19 Construction Waste Management, for additional requirements on protecting vegetation, soils and the environment. Refer to Articles, "Restoration", and "Operations and Storage Areas" for additional instructions concerning repair of damage to structures and site improvements.

(d) Refer to FAR clause 52.236-7, "Permits and Responsibilities," which is included in General Conditions. A National Pollutant Discharge Elimination System (NPDES) permit is required for this project. The Contractor is considered an "operator" under the permit and has extensive responsibility for compliance with permit requirements. The Contractor will make the permit application available at the Resident Engineer's office. The selected contractor and affected subcontractors shall furnish all information and certifications that are required to comply with the permit process and permit requirements. Many of the permit requirements will be satisfied by completing construction as shown and specified. Some requirements involve the Contractor's method of operations and operations planning and the Contractor is responsible for employing best management practices. The affected activities often include, but are not limited to the following:

- Designating areas for equipment maintenance and repair;
- Providing waste receptacles at convenient locations and provide regular collection of wastes;
- Locating equipment wash down areas on site, and provide appropriate control of wash-waters;
- Providing protected storage areas for chemicals, paints, solvents, fertilizers, and other potentially toxic materials; and
- Providing adequately maintained sanitary facilities.

1.17 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 Resident Engineer. Existing work to be altered or extended and that is found to be defective in any way, shall be reported to the Resident Engineer 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 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). Commencing work must be approved and accepted by the COR.

1.18 PROFESSIONAL SURVEYING SERVICES

A registered professional land surveyor or registered civil engineer whose services are retained and paid for by the Contractor shall perform services specified herein and in other specification sections. The Contractor shall certify that the land surveyor or civil engineer is not one who is a regular employee of the Contractor, and that the land surveyor or civil engineer has no financial interest in this contract.

1.19 LAYOUT OF WORK

(a) The Contractor shall lay out the work from Government established base lines and bench marks, indicated on the drawings, and shall be responsible for all measurements in connection with the layout. The Contractor shall furnish, at Contractor's own expense, all stakes, templates, platforms, equipment, tools, materials, and labor required to lay out any part of the work. The Contractor shall be responsible for executing the work to the lines and grades that may be established or indicated by the Contracting Officer. The Contractor shall also be responsible for maintaining and preserving all stakes and other marks established by the Contracting Officer until authorized to remove them. If such marks are destroyed by the Contractor or through Contractor's negligence before their removal is authorized, the Contracting Officer may replace them and deduct the expense of the replacement from any amounts due or to become due to the Contractor (FAR 52.236 17).

(b) Establish and plainly mark center lines for each building and such other lines and grades that are reasonably necessary to properly assure that location, orientation, and elevations established for each such structure and/or addition, roads, parking lots, are in accordance with lines and elevations shown on contract drawings.

(c) Following completion of general mass excavation and before any other permanent work is performed, establish and plainly mark (through use of appropriate batter boards or other means) sufficient additional survey control points or system of points as may be necessary to assure proper alignment, orientation, and grade of all major features of work. Survey shall include, but not be limited to, location of lines and grades of footings, exterior walls, center lines of columns in both directions, major utilities and elevations of floor slabs:

(1) Such additional survey control points or system of points thus established shall be checked and certified by a registered land surveyor or registered civil engineer. Furnish such certification to the Resident Engineer before any work (such as footings, floor slabs, columns, walls, utilities and other major controlling features) is placed.

(d) During progress of work, and particularly as work progresses from floor to floor, Contractor shall have line grades and plumbness of all major form work checked and certified by a registered land surveyor or registered civil engineer as meeting requirements of contract drawings. Furnish such certification to the Resident Engineer before any major items of concrete work are placed. In addition, Contractor shall furnish to the Resident Engineer certificates from a registered land surveyor or registered civil engineer that the following work is complete in every respect as required by contract drawings.

(1) Lines of each building and/or addition.
(2) Elevations of bottoms of footings and tops of floors of each building and/or addition.
(3) Lines and elevations of sewers and of all outside distribution systems.
(4) Lines of elevations of all swales and interment areas.
(5) Lines and elevations of roads, streets and parking lots.

(e) Whenever changes from contract drawings are made in line or grading requiring certificates, record such changes on a reproducible drawing bearing the registered land surveyor or registered civil engineer seal, and forward these drawings upon completion of work to Resident Engineer.

(f) The Contractor shall perform the surveying and layout work of this and other articles and specifications in accordance with the provisions of Article "Professional Surveying Services".

(g) Sea Level Rise Technical Requirements to be <inserted here>

1.20 CONTRACTOR PREPARED AS-BUILT DRAWINGS

(a) In accordance with SPECIAL CONTRACT REQUIREMENT paragraph: CONTRACT DRAWINGS, MAPS AND SPECIFICATIONS, the Government will furnish the Contractor on CD ROM one electronic set of solicitation drawing files and any amendments for use in preparation of as-built drawings by the Contractor. Copies of the drawings will be the responsibility of the Contractor. The as-built drawings shall be a record of the construction as installed and completed by the Contractor. They shall include all the information shown on the contract set of drawings and a record of all deviations, modifications, or changes from those drawings, however minor, which were incorporated in the work, all additional work not appearing on the contract drawings, and all changes which are made after final inspection of the contract work. In the event the Contractor accomplishes additional work which changes the as-built conditions of the facility after submission of the as-built drawings, the Contractor shall furnish revised and/or additional drawings as required to depict as-built conditions. The requirements for these additional drawings will be the same as for the as-built drawings included in the original submittal.

(b) Red line as-built drawings: The Contractor shall have on his staff, personnel to mark up a set of paper copy construction drawings to show the as-built conditions. These as-built marked copies shall be kept current and available on the job site at all times. All changes from the contract plans which are made in the work or additional information which might be uncovered in the course of construction shall be accurately and neatly recorded, as the events occur, by means of details and notes. The Contractor shall call attention to entries by redlining areas affected. The red line as-built will be jointly inspected for accuracy and completeness by the Contracting Officer's representative and a responsible

representative of the Contractor prior to submittal of each request for payment. The Contracting Officer's approval of the current status of the as-built drawings shall be a prerequisite to the Contracting Officer's approval of request for progress payment and request for final payment under the contract. The drawings shall show the following information, but not be limited thereto:

(1) The location and description of any utility lines or other installations of any kind or description known to exist within the construction area. The location includes dimensions to permanent features.

(2) The location and dimensions of any changes within the building or structures.

(3) Correct grade or alignment of roads, structures or utilities if any changes were made from contract plans.

(4) Changes in details of design or additional information obtained from working drawings specified to be prepared and/or furnished by the Contractor including but not limited to fabrication, erection, installation plans and placing details, pipe sizes, insulation material, dimensions of equipment foundations, etc.

(5) All changes or modifications which result from the final inspection.

(6) Options: Where contract drawings or specifications allow options, only the option selected for construction shall be shown on the as-built drawings.

(7) Extensions of Design: Shop Drawings such as structural fabrication and erection drawings, fire alarm systems, and sprinkler systems that will require extensive redrafting effort in order to create a electronic set will not be required to be incorporated into the electronic set. They will be included as an Appendix to the paper copy set.

(c) Submittal of as-built drawings for review and approval: The Contractor shall participate in monthly review meetings with the Contracting Officer to show the progress made the preceding month and make all required changes. At time of final construction inspection, the Contractor shall submit one copy of the red lined as-built drawings to the Contracting Officer for his review and approval. The as-built drawings shall be certified as to their correctness by the signature of an authorized representative of the Contractor. Upon Government approval of the Contractor's redlined copy of the as-built drawings, the Contractor shall prepare and provide three electronic sets of as-built drawings by incorporating the red line marked up notations on the construction drawings into the electronic set of solicitation drawings and amendments. In addition to the electronic sets of as-built drawings which shall be submitted on a CD-ROM, the Contractor shall also submit a full size set of as-built paper drawings. Submittals are to be to the Contracting Officer not later than ten (10) calendar days after project completion date.

(d) Final Drawing Format.

(1) The solicitation drawing files and any amendments thereto will be furnished to the Contractor in electronic format. The solicitation drawing files have been prepared in AutoCad format. The drawing file indicates the format which the drawing was developed. The Contractor shall utilize the latest version of AutoCad to revise/redraft each solicitation

drawing and/or amendment drawing to reflect all changes made during construction as indicated by the red line marked up notations on the construction drawings. Revisions/redrafting shall match the font styles, sizes, and formats; line weights/thicknesses and styles/types; and all other drafting elements used on the solicitation drawing/amendments. All elements must be incorporated into each as-built drawing file; the use of reference files shall not be permitted. Completed as-built drawings shall be provided to the Government in Building Information Modeling (BIM) format in accordance with the BIM Guide" http://www.cfm.va.gov/til/bim/BIMguide/.

(2) All revisions made to the solicitation drawings and/or amendment drawings to reflect changes made during construction shall be flagged and shall have the revision block completed as follows. The entry in the description column of the revision block shall read 'AS-BUILT'. The date of the revision and one approving initial from a responsible person within the Contractor's Firm shall also be included in the revision block. Above the drawing title block the drawing will be labeled in bold letters 'AS-BUILT'. The flagged changes and revision block format shall be in accordance with the examples shown in the Mobile District Design Manual located on the Internet at http://www.sam.usace.army.mil/sam/en/guides/DesMan/desman.htm. The Contractor shall also furnish a revised index of drawings to match the actual design drawings. The drawing title blocks shall be in a uniform format to match the requirements as specified in the Design Manual.

(3) The three electronic sets of as-built drawing files shall be submitted in AutoCad format.

(4) The hard copy reproducible set of as-built drawings shall be submitted unbound on paper. The drawings shall be one set of the full size, and one set of half size.

(5) Working with the medical center, the contractor shall assure that the data for Facilities Management use (as noted in the VA TIL BIM Guide, http://www.cfm.gov/til/bim/BIMguide/) developed through the design and construction activities is verified, loaded, and tested in the VA's Computer Maintenance and Management System (Maximo).

(6) Payment: No separate payment will be made for the as-built drawings required under this contract, and all costs in connection there-with will be considered a subsidiary obligation of the Contract.

(7) All above information shall also apply to shop drawings.

1.21 USE OF ROADWAYS

(a) For hauling, use only established public roads and roads on property and, when authorized by the Resident Engineer, such temporary roads which are necessary in the performance of contract work. Temporary roads shall be constructed by the Contractor at Contractor's expense. When necessary to cross curbing, sidewalks, or similar construction, they must be protected by well constructed bridges.

(b) When new permanent roads are to be a part of this contract, Contractor may construct them immediately for use to facilitate building operations. These roads may be used by all who have business thereon within zone of building operations.

(c) When certain buildings (or parts of certain buildings) are required to be completed in advance of general date of completion, all roads leading thereto must be completed and available for use at time set for completion of such buildings or parts thereof.

1.22 RESIDENT ENGINEER'S FIELD OFFICE

(a) The Contractor shall, within fifteen (15) days of contract award, provide a temporary field office and adequate furniture for use of the Resident Engineer for the duration of the project. Office and furniture shall be new. This office space can be co-located with contractor upon its mobilization as long a separation can be maintained between USACE, CFM and Contractor.

(b) The field offices shall provide adequate office space for a minimum of (15) USACE personnel and for (3) VA CFM personal with final approval of layout by the Resident Engineer to include restroom facilities and common spaces. Installation of the office shall meet all local codes.

(c) Interior finishes shall consist of carpeted flooring, plywood paneling or painted wallboard on walls, and acoustical tile ceilings. Interior doors may be either painted or stained.

(d) Window openings shall be fitted with security bars to prevent any forced entry. The doors of field office shall have a hasp and padlock and also deadbolts keyed from both sides.

(e) Enclose the entire perimeter of the office from the floor to the ground and finish to match exterior.

(f) Provide office with two, 900 mm (three foot) wide exterior doors, including hardware and OSHA approved covered platform and stairs leading to grade.

(g) The Contractor shall provide the following:
(1) Electricity, hot and cold water, sanitary, and necessary utility services for contract duration.
(2) Provide wireless network, exact location and set up to be coordinated with the Resident Engineer and other items necessary to provide a habitable structure for the purpose intended.
(3) The Contractor shall install and pay the monthly fees for a suitable alarm system for the field office.

(h) Contractor shall, for the contract duration provide the following:
(1) Dedicated, uninterrupted internet access through satellite or other reliable means to support a minimum of 8 computers total. This access must remain independent from contractor network due to USACE security requirements.
(2) Dedicated, uninterrupted telephone service through satellite or other reliable means to support a minimum of 8 phones.
(3) Dedicated, uninterrupted fax service through satellite or other reliable means.
(4) A suitable security alarm system and remote monitoring service.
(5) Maintenance of utility services, including weekly pumping of storage tanks.
(6) Supplies (toilet paper, paper towels, soap, etc.), daily trash removal and weekly janitorial services to include vacuuming of carpets, dusting of all furniture, and sweeping and mopping of all hard floor surfaces.

(7) Potable bottled water and water cooler, and fuel and electric power for normal office uses, including lights, heating and air conditioning.

(i) The Contractor shall provide the following new items:

15	Office desks, double pedestal
1	Conference tables 900 mm x 1800 mm (size 3' x 6')
15	Office chairs
15	Swivel chairs with arms
20	Conference chairs (armless and folding)
10	Lockable 5 drawer file cabinets, letter size
15	Bookcases
1	Electric Refrigerator
1	Electric Microwave
2	Shelves for samples 900 mm x 450 mm x 1.8 m (36" x 18" x 72") high
10	adjustable shelves

(j) At the end of the contract duration the contractor shall remove the office facilities and supporting components in their entirety then restore the affected area.

1.23 TEMPORARY USE OF MECHANICAL AND ELECTRICAL EQUIPMENT

(a) Use of new installed mechanical and electrical equipment to provide heat, ventilation, plumbing, light and power will be permitted subject to compliance with the following provisions:

(1) Permission to use each unit or system must be given by Resident Engineer. If the equipment is not installed and maintained in accordance with the following provisions, the Resident Engineer will withdraw permission for use of the equipment.

(2) Electrical installations used by the equipment shall be completed in accordance with the drawings and specifications to prevent damage to the equipment and the electrical systems, i.e. transformers, relays, circuit breakers, fuses, conductors, motor controllers and their overload elements shall be properly sized, coordinated and adjusted. Voltage supplied to each item of equipment shall be verified to be correct and it shall be determined that motors are not overloaded. The electrical equipment shall be thoroughly cleaned before using it and again immediately before final inspection including vacuum cleaning and wiping clean interior and exterior surfaces.

(3) Units shall be properly lubricated, balanced, and aligned. Vibrations must be eliminated.

(4) Automatic temperature control systems for preheat coils shall function properly and all safety controls shall function to prevent coil freeze up damage.

(5) The air filtering system utilized shall be that which is designed for the system when complete, and all filter elements shall be replaced at completion of construction and prior to testing and balancing of system.

(6) All components of heat production and distribution system, metering equipment, condensate returns, and other auxiliary facilities used in temporary service shall be cleaned prior to use; maintained to prevent corrosion internally and externally during use; and cleaned, maintained and inspected prior to acceptance by the Government. Boilers, pumps, feedwater heaters and auxiliary equipment must be operated as a complete system and

be fully maintained by operating personnel. Boiler water must be given complete and continuous chemical treatment.

(b) Prior to final inspection, the equipment or parts used that show wear and tear beyond normal, shall be replaced with identical replacements, at no additional cost to the Government.

(c) This paragraph shall not reduce the requirements of the mechanical and electrical specifications sections.

(d) Any damage to the equipment or excessive wear due to prolonged use will be repaired replaced by the contractor at the contractor's expense.

1.24 TEMPORARY USE OF EXISTING ELEVATORS

CONTRACTOR WILL NOT BE ALLOWED THE USE OF EXISTING ELEVATORS. OUTSIDE TYPE HOIST SHALL BE USED BY CONTRACTOR FOR TRANSPORTING MATERIALS AND EQUIPMENT.

1.25 TEMPORARY USE OF NEW ELEVATORS

(a) Contractor and its personnel shall be permitted use of new elevator(s) subject to the following provisions:
(1) Contractor shall make arrangements with the Resident Engineer for use of elevator(s). Contractor may obtain elevator(s) for exclusive use.
(2) Prior to the use of elevator(s), the Contractor shall have the elevator(s) inspected and accepted by an ASME accredited, certified elevator safety inspector. The acceptance report shall be submitted to the Resident Engineer.
(3) Submit to the Resident Engineer the schedule and procedures for maintaining equipment. Indicate the day or days of the week and total hours required for maintenance. A report shall be submitted to the Resident Engineer monthly indicating the type of maintenance conducted, hours used, and any repairs made to the elevator(s).
(4) The Contractor shall be responsible for enforcing the maintenance procedures.
(5) During temporary use of elevator(s) all repairs, equipment replacement and cost of maintenance shall be the responsibility of the Contractor.
(6) Personnel for operating elevator(s) shall not be provided by the Department of Veterans Affairs.
(7) Contractor shall cover and provide maximum protection of the entire elevator(s) installation.
(8) The Contractor shall arrange for the elevator company to perform operation of the elevator(s) so that an ASME accredited, certified elevator safety inspector can evaluate the equipment. The Contractor shall be responsible for any costs of the elevator company.
(9) All elevator(s) parts worn or damaged during temporary use shall be removed and replaced with new parts. This shall be determined by an ASME accredited certified elevator safety inspector after temporary use and before acceptance by the Government. Submit report to the Resident Engineer for approval.
(10) Elevator shall be tested as required by the testing section of the elevator(s) specifications before acceptance by the Department of Veterans Affairs.

1.26 TEMPORARY TOILETS

Provide where directed, (for use of all Contractor's workmen) ample

temporary sanitary toilet accommodations with suitable sewer and water connections; or, when approved by Resident Engineer, provide suitable dry closets where directed. Keep such places clean and free from flies, and all connections and appliances connected therewith are to be removed prior to completion of contract, and premises left perfectly clean.

1.27 AVAILABILITY AND USE OF UTILITY SERVICES

(a) The Government shall make all reasonably required utilities available to the Contractor as specified in the contract. The amount to be paid by the Contractor for chargeable utilities shall be the prevailing rates charged to the Government. The Contractor shall carefully conserve any utilities furnished without charge. WHAT THIS SECTION MEANS: The government will ensure the utility (electric, water, gas, chilled water, etc.) is available for connection but the contractor must pay for its use during construction with consumption verified by contractor-provided meters. Utility use cannot commence until the RE verifies appropriate metering is in place.

(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, and all meters required to measure the amount of electricity, water, or other utility used for the purpose of determining charges. Before final acceptance of the work by the Government, the Contractor shall remove all the temporary connections, distribution lines, meters, and associated paraphernalia.

(c) Contractor shall install meters at Contractor's expense and furnish the Government a monthly record of the Contractor's usage on the 5th day of every month of electricity, water, or other utility as hereinafter specified.

(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. Cost of temporary heat shall be at the Contractor's expense.

(e) Electricity (for Construction and Testing): Furnish all temporary electric services at Contractor's expense.

(f) Water (for Construction and Testing): Furnish temporary water service at Contractor's expense.

(g) Steam: If required furnish steam system for testing required in various sections of specifications at Contractor's expense.

(h) Fuel: Natural and LP gas and burner fuel oil required for boiler cleaning, normal initial boiler burner setup and adjusting, and for performing the specified boiler tests will be furnished by the Contractor. Fuel required for prolonged boiler burner setup, adjustments, or modifications due to improper design or operation of boiler, burner, or control devices shall be furnished by the Contractor at Contractor's expense.

1.28 NEW TELEPHONE EQUIPMENT

The contractor shall coordinate with the work the installation of telephone

equipment by others. This work shall be completed before the building and or phase is turned over to VA.

1.29 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, refer to section 01 91 00 for requirements.

(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 that 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 that 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 that 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.

(f) Refer to section 01 91 00 for Perturbation Testing Requirements.

1.30 INSTRUCTIONS

(a) Contractor shall furnish draft Maintenance and Operating manuals and verbal instructions when required by the various sections of the specifications during the submittal process and as hereinafter specified.

(b) Manuals: Final Maintenance and Operating manuals (four copies each) for each separate piece of equipment shall be delivered to the Resident Engineer 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 Resident Engineer and shall be considered concluded only when the Resident Engineer is satisfied in regard to complete and thorough coverage. The US Army Corp of Engineers reserves the right to request the removal of, and substitution for, any instructor who, in the opinion of the Resident Engineer, does not demonstrate sufficient qualifications in accordance with requirements for instructors above.

1.31 GOVERNMENT-FURNISHED PROPERTY

(a) The Government shall deliver to the Contractor, the Government furnished property shown on the drawings.

(b) Equipment furnished by Government to be installed by Contractor will be furnished to Contractor at the Medical Center.

(c) Contractor shall be prepared to receive this equipment from Government and store or place such equipment not less than 90 days before Completion Date of project.

(d) Notify Contracting Officer in writing, 60 days in advance, of date on which Contractor will be prepared to receive equipment furnished by Government. Arrangements will then be made by the Government for delivery of equipment.

(1) Immediately upon delivery of equipment, Contractor shall arrange for a joint inspection thereof with a representative of the Government. At such time the Contractor shall acknowledge receipt of equipment described, make notations, and immediately furnish the Government representative with a written statement as to its condition or shortages.

(2) Contractor thereafter is responsible for such equipment until such time as acceptance of contract work is made by the Government.

(e) Equipment furnished by the Government will be delivered in a partially assembled (knock down) condition in accordance with existing standard commercial practices, complete with all fittings, fastenings, and appliances necessary for connections to respective services installed under contract. All fittings and appliances (i.e., couplings, ells, tees, nipples, piping, conduits, cables, and the like) necessary to make the connection between the Government furnished equipment item and the utility stub up shall be furnished and installed by the contractor at no additional cost to the Government.

(f) Completely assemble and install the Government furnished equipment in place ready for proper operation in accordance with specifications and drawings.

(g) Furnish supervision of installation of equipment at construction site by qualified factory trained technicians regularly employed by the equipment manufacturer.

1.32 PROJECT SIGN

The Contractor shall furnish and install a project sign at the location designated by the Contracting Officer within 30 days after notice to proceed. The sign shall be constructed with a face sheet of 1/2-inch thick, grade A-C, exterior plywood mounted on a substantial framework of treated wood, sized and detailed as shown on Figure 4E, Erection Details, bound herein. Lettering, color, and paint shall conform to the details shown in the Construction Sign figure, and Figure 5D "Safety Performance Sign," bound herein, except the background on the Construction sign shall be brown, semi-gloss color Fed. Std. 595a "20100" with white lettering to match base standard colors/materials. The sign shall receive one coat of primer paint followed by 2 coats of semi-gloss exterior enamel. Lettering shall be with gloss exterior enamel. The Contractor shall coordinate emblem acquisition with the Resident Engineer. The Contractor shall maintain the sign in a "like new" condition throughout the life of the project, repainting and replacing members as necessary to accomplish this requirement. Upon completion of the work under this contract, the project sign shall be removed from the job site and shall remain the property of the Contractor. No direct payment will be made for the sign nor for maintenance of the sign.

1.33 SAFETY SIGN

Provide a Safety Sign where directed by Resident Engineer. Post the number of accident free days on a daily basis. Maintain sign and remove it when directed by Resident Engineer.

1.34 BULLETIN BOARD

Refer to Section 00800.

1.35 CONSTRUCTION DIGITAL IMAGES

(a) During the construction period through completion, furnish Department of Veterans Affairs with 3 views of aerial progress photos on a monthly basis.

(b) Images shall be taken by a commercial photographer and must show distinctly, at as large a scale as possible, all parts of work embraced in the picture.

(c) Images on CD-ROM shall be recorded in JPEG format with a minimum of 24 bit color and no reduction in actual picture size. Compressed size of the file shall be no less than 80% or the original with no loss of information. File names shall contain the date the image was taken, the Project number and a unique sequential identifier. The CD-ROM shall also contain an index of all the images contained therein in either a TXT or Microsoft Word format.

1.36 FINAL ELEVATION DIGITAL IMAGES

(a) A minimum of four (4) images of each elevation shall be taken with a minimum 6 MP camera, by a professional photographer with different settings to allow the Resident Engineer to select the image to be printed. All images are provided to the RE on a CD.

(b) Photographs shall be taken upon completion, including landscaping. They shall be taken on a clear sunny day to obtain sufficient detail to show depth and to provide clear, sharp pictures.

1.37 PROJECT PROGRESS DOCUMENTATION

(a) During the construction period through completion, the Contractor shall provide an acceptable Visual Project Progress Documentation Plan to VA to document construction progress. The Visual Project Progress Documentation Plan shall include a strategy/schedule for providing visual documentation and a formal document repository system. Visual documentation shall be done primarily through scanning and shall be identified by the physical location of the scan and the date taken. The scans shall be measurable. The Contractor may propose other visual documentation options where scanning would not be appropriate or easily possible. Those images shall also be identified on a map and by date taken. All visual images shall be appropriately scaled so that detail can be readily comprehended.

(b) There shall be a formal document repository system to store project progress images which shall include the ability to link information in multi-formats with a location map to show where the images were obtained. Miscellaneous events that occur during any Contractor site visit, or events captured by the Department of Veterans Affairs independently, shall be dated, labeled and inserted into a separate section(s) in the document system.

(c) Coordination of visual documentation shall be coordinated by the Resident Engineer. The visual documenters may also attend construction coordination meetings as necessary.

(d) Contractor's operations team shall provide regular updates regarding the status of the visual documentation, including availability of concluded work and anticipated future shoot dates.

(e) Contractor shall provide all on-line domain/web hosting, security measures, and redundant server back-up of the documentation.

(f) The Contractor shall provide technical support related to using the system or service.

(g) Upon completion of the project, final copies of the documentation (the "Permanent Record") with the indexing and navigation system embedded (and active) shall be provided in an electronic media format, typically a DVD or external hard-drive. Permanent Record shall have Building Information Modeling (BIM) interface capabilities. On-line access terminates upon delivery of the Permanent Record.

(h) Before construction, the building pad, adjacent streets, roadways, parkways, driveways, curbs, sidewalks, landscaping, adjacent utilities and adjacent structures surrounding the building pad and site shall be visually documented. If site work or pad preparation is extensive, this documentation may be required immediately before construction and at

several predetermined intervals before building work commences.

(i) Construction progress for all trades shall be visually documented at predetermined intervals, but not less than once every thirty (30) calendar days ("Progressions"). Progression documentation shall track both the exterior and interior construction of the building. Exterior progressions shall track 360 degrees around the site and each building. Interior Progressions shall track interior improvements beginning when stud work commences and continuing until project completion.

(j) As-built condition of pre-foundation utilities and site utilities shall be documented prior to pouring footers, placing concrete and/or backfilling. This process shall include all underground and in-slab utilities within the building(s) envelope(s) and utility runs in the immediate vicinity of the building(s) envelope(s). This may also include utilities enclosed in slab-on-deck in multi-story buildings.

(k) As-built conditions of mechanical, electrical, plumbing and all other systems shall be documented (scanned) post-inspection and pre-insulation, sheet rock or dry wall installation. This process shall include all finished systems located in the walls and ceilings of all buildings at the Project.

(l) As-built conditions of exterior skin and elevations shall be documented as directed by the Resident Engineer in order to capture pre-determined focal points, such as waterproofing, window flashing, radiused steel work, architectural or Exterior Insulation and Finish Systems (EIFS) detailing. Overlapping photographic techniques shall be used to insure maximum coverage.

(m) As-built finished conditions of the interior of each building including floors, ceilings and walls shall be documented at certificate of occupancy or equivalent, or just prior to occupancy, or both, as directed by the Resident Engineer.

(n) Monthly (29 max) exterior progressions (360 degrees around the project) and slideshows (all elevations and building envelope). The slideshows shall allow for the inclusion of the Department of Veterans Affairs' pictures, aerial photographs, and timely images which do not fit into any regular monthly documentation.

(o) Weekly (21 Max) Site Progressions - visual documentation capturing the project at different stages of construction. These progressions shall capture underground utilities, excavation, grading, backfill, landscaping, and road construction throughout the duration of the project.

(p) Regular (8 max) interior progressions of all walls of the entire project to begin at time of substantial framed or as directed by the Resident Engineer through to completion.

(q) Detailed Exact-Built of all Slabs for all project slab pours just prior to placing concrete or as directed by the Resident Engineer.

(r) Visual documentation of all finished detailed Interior walls, ceilings, and floors to be scheduled by Resident Engineer prior to occupancy

(s) In event a greater or lesser number of visual documentations than specified above are required by the Resident Engineer, adjustment in contract price will be made in accordance with clause entitled "CHANGES"

(FAR 52.243-4 and VAAR 852.236-88).

1.38 CONSTRUCTION/SITE MANAGEMENT STANDARDS

(a) GENERAL

See attached document for more detail, Construction Environmental Management Plan (CEMP).

The following standards relate to the appearance of the construction site during the construction cycle, temporary administrative and storage areas, and service facilities needed for execution and completion of the work.

The Contractor shall submit a written request for a construction trailer site and material lay-down area. All efforts to ensure close proximity to the actual construction site will be utilized. The Contractor shall ensure that the construction trailer is properly marked, with company name and contact information clearly posted. The site, if visual to public, shall have a temporary PVC coated, chain link fence with slats or other visual barrier. All trailers shall be skirted and shall match base standard exterior color "conch shell". The Contractor shall be responsible for the storage and protection of all of his materials and equipment. He shall also be responsible for enclosing the assigned storage spaces with a fence as described in paragraph entitled CONSTRUCTION AND SAFETY FENCE, herein below. The fence shall be maintained in good repair continuously throughout construction. The intent is to conceal construction materials, equipment, and debris from adjacent occupied areas. Upon completion of the contract the Contractor shall be responsible for removing the fence and restoring the site to its original condition.

The Contractor shall screen grouped temporary facilities from the public view.

A visually acceptable site is an important construction standard. A clean, well-kept site will help ensure compliance with the safety and environmental requirements of the contract. Contractor's trailers and storage buildings shall follow the base paint standards. The Contractor shall maintain the trailers or storage buildings in good condition or they shall be removed. The Contractor is responsible for the security of his property and general housekeeping of the area(s).

(b) SITE PLAN. Prior to starting the work, the Contractor shall submit site plans to the Contracting Officer's Representative for approval showing the layout and details of all temporary facilities used for this contract. The Contracting Officer's Representative will coordinate the plans with the base approval authority. The plan shall include the location of:

- Safety and construction entrances
- Trash dumpsters
- Temporary sanitary facilities
- Worker parking areas
- Contractor, sheds and trailers,
- Contractor storage areas
- Staging areas
- Temporary utility tie-ins
- Contractor security fencing
- Project sign
- Telephone service and locations.
- Site drainage/dewatering plan

Site photographs prior to the start of work may be included with the plan. At completion of work, the contractor shall remove the facilities and restore the site to its original condition.

(c) DIRT AND DUST CONTROL PLAN: The Contractor shall submit truck and material haul routes along with a plan for controlling dirt, debris and dust on base roadways. As a minimum, the plan shall identify the subcontractor and equipment for cleaning along the haul route and measures to reduce dirt, dust, and debris from roadways.

(d) CONTRACTOR'S TEMPORARY FACILITIES: Administrative Field Offices and Material Storage Trailers: Contractor's administrative field office and storage trailers shall be in like new condition and the exterior shall match the base standard color. Locate the office and trailers behind the construction fence unless otherwise indicated on the drawings. Storage of material's/debris under the trailers is prohibited.

(e) SUPPLEMENTAL STORAGE AREA: This area is for storage of items not immediately required at the construction site. The location is indicated on the drawings. The Contractor is responsible for the security of the stored property and general housekeeping.

(f) PRIMARY STORAGE AREA: Site storage is limited to the material that is needed within one week. Enclose the storage area by a construction fence, as described later, unless otherwise indicated on the drawings.

(g) DUMPSTERS: Equip dumpsters with a secure cover. Dumpsters shall be brown in color. The cover shall be closed at all times, except when being loaded with trash and debris. Locate dumpsters behind the construction fence or out of the public view. Empty site dumpsters at least once a week, or as needed to keep the site free of debris and trash. If necessary, provide 208 liter (55 gallon) trash containers at least once a day. Large demolition normally requires a large dumpster without lids. These dumpsters are acceptable but should not have debris higher than the sides before emptying.

(h) TEMPORARY SANITATION FACILITIES: All temporary sewer and sanitation facilities shall be self contained units with both urinals and stool capabilities. Ventilate the units to control odors and fumes and empty and clean them at least once a week or more often if required by the contracting officer. The doors should be self-closing. The exterior of the unit will match the base standard. Locate the facility behind the construction fence or out of the public view.

(i) CONSTRUCTION AND SAFETY FENCE: Enclose the project work area and contractor lay-down area with a 1.83m (6 foot) high chain link fence with black, vinyl coated, chain link fence and posts with a black plastic fabric mesh tennis court netting attached, UV light resistant, and gates. The fence shall be removed upon completion and acceptance of the work. The intent is to block the construction site from public view.

The Contractor shall also provide a temporary safety fence with gates and warning signs at the construction site prior to the start of work to protect the public from construction activities. The safety fence will enclosed those areas not within the construction fence. The safety fence will match the base standard or be bright orange where it protects excavated areas, high density polyethylene grid or approved equal, a minimum of 1.1m (42 inches) high, supported and tightly secured to steel

posts located on minimum 3m (10 foot) centers. The Contractor shall remove the fence from the work site upon completion on the contract.

(j) GRASS CUTTING: Cut grass (or annual weeds) within the construction and storage sites to a 4-inch height at least once a week during the growing season unless the grass area is not visible to the public. Trim the grass around fences at time of grass cutting. Grass or weeds on stockpiled earth shall be maintained as described above.

1.39 HURRICANE EVACUATION PLAN

Within 10 days of the contract notice to proceed, the Contractor shall submit to the Contracting Officer's Representative, and maintain on-site, a hurricane evacuation plan outlining the procedures to be performed by the Contractor to secure the site in the event of a hurricane or tropical storm.

1.40 ACCESS AND HAUL ROADS

(a) Access and haul routes designated for this project are noted on the drawings. The restriction of the Contractor's movement within the base and the provision that the Contractor maintain and keep open access and haul routes will be enforced during the entire period of this contract.

(b) Daily Inspection. The Contractor shall inspect the roadways and adjacent areas daily for scrap, debris, and other waste material and remove all such items to areas designated for disposal of waste. The Contractor shall also inspect road surfaces, bed and drainage structures for damage and report such damage to the Contracting Officer and indicate the repair schedule in a weekly report. Haul roads shall be graded and otherwise maintained to keep the surface free from potholes, ruts, and similar conditions that could result in unsafe operation. Dust abatement shall permit observation of objects on the roadway at a minimum distance of 300 ft. Review and revise, if necessary, operating schedules with all other users of roadway. The revised report and schedule shall be submitted to the Contracting Officer's Representative for approval.

(c) Weekly Inspection. The Contractor shall inspect the roadways and adjacent areas daily accompanied by a representative of the Contracting Officer and shall provide a report to the Contracting Officer's Representative outlining daily inspections with a list of damages discovered in daily inspections and report any repairs accomplished during the week. Review and revise, if necessary, operating schedules with all other users of roadway. The revised report and schedule shall be submitted to the Contracting Officer's Representative for approval.

(d) All access and haul routes shall be maintained in a clean, orderly and safe condition during the contract period. Access or haul routes used by others shall be kept open at all times.

1.41 COORDINATION CONFERENCES AND CONSTRUCTION PROGRESS BRIEFING

Routine coordination conferences will be scheduled by the Contracting Officer's Representative throughout the life of this contract. Coordination conferences will be held to discuss contract administration, Contractor quality control, phasing, scheduling, and other aspects relating to this construction. The Using Agency, Corps of Engineers and the Contractor will be represented at each of these meetings. Coordination conferences will be scheduled to occur on a weekly basis. Minutes for these meetings shall be recorded by the Contractor and distributed to the

organizations above and to others as required.

1.42 HISTORIC PRESERVATION

Where the Contractor or any of the Contractor's employees, prior to, or during the construction work, are advised of or discover any possible archeological, historical and/or cultural resources, the Contractor shall immediately notify the Resident Engineer verbally, and then with a written follow up.

1.43 CONSTRUCTION/DEMOLITION PHASING REQUIREMENTS

The Contractor shall be responsible for development of a final construction/demolition phasing plan. The final phasing plan shall be developed in cooperation with the on-site operating personnel and approved by the Contracting Officer's Representative prior to commencement of physical work on the project. The Contractor's phasing plan for construction, start-up, operation, and demolition shall be scheduled to occur up to but not to exceed the length of construction time as set forth in the Special Clause entitled "Commencement, Prosecution, and Completion of Work".

1.44 GOVERNMENT ACCESS TO PROJECT FACILITIES

(a) Concurrent Access: In order to facilitate the Government's full occupancy of all project facilities, the Government shall be allowed access at anytime during construction to conduct interim inspections and any testing required to meet facilities commissioning. The Government will coordinate access with the Offeror as far in advance as possible and prior to entering any facilities.

(1) The Government will independently procure and install all office electronics (secure network servers, printers, facsimile machines, etc.), audio/visual, and electronic laboratory equipment. In order to facilitate the Government's full occupancy of all project facilities, the Government shall be allowed early access at least 180 days prior to Beneficial Occupancy for the purposes of delivery and installation of these items.

(2) Acknowledgments and Additional Requirements:

a. The Government's concurrent or early access to any areas or specific rooms in advance of the overall facility acceptance for the purposes of performing work in accordance with this provision in no way constitutes Government's acceptance of the certain areas or specific rooms, or of the facility.

b. Government will not impinge or impede Contractor's work and will cooperate to the fullest degree to minimize potential conflicts.

c. Government will manage its contractors to the fullest to minimize damage to Offeror's work. Should there be damage to Offeror's work, Government reserves may by mutual agreement between Government and Offeror execute change to Offeror's contract.

d. All persons needing early access must comply with OSHA, EM 385-1-1, and any specific requirements set by the Offeror (such as mandatory safety training).

e. Government contractors are responsible for their own trash pickup, safety equipment, site offices and storage and toilet facilities. Government contractors shall not use the facility restrooms.

f. The Offeror shall coordinate the Government contractors' work with its work in advance to avoid conflict in completion of the build-out.

g. As part of the base contract, the Offeror shall install all telephone, alarm, access control, video and fiber optic cabling and/or copper wire, including the Government's complete cable tray and wire way system prior to the Government's contractor's installation of any specialized electronic equipment.

h. The Offeror shall have all HVAC systems fully operational prior to installation of any FF&E or electronic equipment regardless of Government or Offer procurement and installation.

i. The Offeror shall provide for secure entrance to any areas in any facilities where the Government has installed FF&E or electronic equipment.

1.45 GOVERNMENT PERFORMANCE OF COMMISSIONING:

The Government shall be allowed access to the appropriate facility to perform LEED Commissioning not later that the start of the Offeror's installation of furniture, fixtures and equipment (FF&E). The Government shall be allowed early access at least 180 days prior to Beneficial Occupancy for the purposes of field verifications required for LEED Enhanced Commissioning.

1.46 BENEFICIAL OCCUPANCY DATE (BOD):

The Beneficial Occupancy Date is the date on which beneficial occupancy may be granted to the agency requiring use of the facility following construction. By mutual agreement the occupying agency will allow the construction agency access as required to complete remaining items of construction pursuant to the construction contract.

For this contract, BOD shall require but shall not be limited to the following -

(a) Categorization of phases shall be specifically identified to identify restrictions on construction.

(b) The Contractor shall submit to the Contracting Officer's Representative for approval all requests for demolition and switch-overs a minimum of 30 days in advance of the Contractor's anticipated "date of action."

(c) All costs associated with preparing the phasing plan, adhering to the plan, executing switch-overs, and tie-ins, demolition, and coordination shall be the full responsibility of the Contractor and are not reimbursable by the Government.

1.47 CONSTRUCTION DEBRIS REMOVAL AND DISPOSAL

(a) Non-salvageable material and debris shall be removed from work areas and disposed of daily.

1.48 SOFTWARE REQUIREMENTS

The Contractor shall provide the Government with clear title (licensed, original copies) to all software, complete documentation of COTS (Commercial Off The Shelf) software, and configuration controlled source code and documentation of any developed software (e.g., ladder logic developed and revised as testing progresses on the HVAC system). The title shall be capable of being transferable to the VA. This requirement shall include all software used on the project, including, but not limited to, software for the following, to the extent that they are included in the project:

- Diesel generators;
- Elevators;
- Fire detection and alarm systems;
- HVAC systems;
- Lightning rod mast;
- Water chillers;
- Any subsystem requiring additional software used to develop or modify the software that is resident in these systems.

1.49 DOCUMENTATION

Documentation shall include software manuals, diskettes, printouts of software program routines and subroutines, and flowcharts of programs, routines and subroutines. Depiction of "black box" logic or documentation shall not be permitted. ADDITIONAL WARRANTY OF CONSTRUCTION

(a) Warranty Administrator. The Contractor shall retain a warranty administrator through the one-year warranty period to monitor and respond to inquiries and expedite solutions for warranty-related problems. The Contractor shall furnish his own facilities (office, sanitary facilities, water, telephone, etc.) for the warranty administrator off of, but within sixty (60) miles of, James A Haley Veterans Hospital, Tampa, FL. The warranty administrator point of contact is not required to be on site 24 hours a day, 7 days a week, but shall be available during reasonable business hours. The warranty administrator shall be an Engineer as required in the Specification Section: CONTRACTOR QUALITY CONTROL.

(b) Warranty Function: The warranty administrator will have authority to act for the Contractor in resolving warranty issues. He will serve as the Contractor's single point of contact with the Contracting Officer for determining whether a failure, defect, or damage should be repaired or replaced under the provisions of this special clause, and will coordinate the efforts of subcontractors and suppliers in the execution of their warranty responsibilities.

(c) Warranty of Construction: In addition to any other warranties set out elsewhere in this contract, the Contractor warrants that work performed under this contract conforms to the contract requirements and is free of any defect of equipment, material, as-built drawings, design furnished, or workmanship performed by the Contractor or any of his subcontractors or suppliers at any tier. Such warranty shall continue for a period of one (1) year from the date of final acceptance of the work. Any part of the work which the Government takes possession of prior to final acceptance, such warranty shall continue for a period of one (1) year from the date the Government takes possession. However, if any part or portion of the work

which the Government takes possession is specifically exempted by the Government, warranty shall continue for one year from final acceptance of that part or portion of the work. The Contractor shall remedy at his expense any failure to conform, or any defect.

(d) Under this warranty, the Contractor will remedy, at its own expense, any damage to Government owned or controlled real or personal property, when the damage is the result of the Contractor's failure to conform to contract requirements or any such defect of equipment, material, workmanship or design furnished by the Contractor. Under the terms of this paragraph, the Contractor's warranty with respect to repair or replacement hereunder will run for one (1) year from the date of such repair or replacement. The Contractor shall tag such items to indicate new warranty date. In addition, if a particular system is inoperative or unusable due to a failed, defective, or damaged item, the warranty period for all other items in the system will be extended for the period that the system is inoperative or unusable.

(e) The Government will formally notify the Contractor in writing within a reasonable time after the discovery of any failure, defect, or damage, after verbally notifying the warranty administrator.

(f) Within 24-hours after receipt of verbal or written notification or any failure, defect, or damage, the Contractor will be required to get on site and identify both the problem and solution for the following items of work:

Within seven (7) calendar days after receipt of notification of any failure, defect, or damage, the Contractor will be required to get on site and identify both the problem and solution.

(g) Due to the unique mission requirements of this project, time is of the essence in the performance of warranty work. If the Contracting Officer's representative determines that any failure, defect, or damage described herein is mission essential, and the Contractor's warranty administrator is not able to arrange or effect timely repair or replacement, the Government has the right, at its option, to immediately replace, repair, or otherwise remedy such failure, defect, or damage. Upon written notice given the Contractor by the Government that the failure, defect, or damage has been corrected, the Contractor shall, within 10 working days, prepare and submit a cost proposal to the Government for the correction of the failure, defect, or damage. Upon receipt of the proposal, the Government will inform the Contractor in writing of its costs to correct the failure, defect, or damage. If the Contractor's cost proposal is greater than the Government cost, the Contractor is liable to the Government for costs actually incurred by the Government. If the Contractor's cost proposal is less than actual Government cost, or if the Contractor alleges that costs incurred by the Government are beyond the scope of this Special Clause, the Contractor shall be prepared for on-site negotiations within 10 working days of receipt of the Government's cost. If resolution is not forthcoming through on-site negotiation within 10 working days, all disputes arising under this Special Clause will be submitted within an additional 10 working days to arbitration before an arbitrator which is mutually agreeable to the parties to this contract. The Contractor shall provide the Government a plan for selection of the arbitrator as a part of its proposal. Costs for arbitration shall be shared by the parties. In no case shall a determination by the arbitrator be delayed beyond three months from the date of submittal to arbitration. Except as otherwise stated herein, arbitration shall be conducted in

accordance with the Construction Industry Arbitration Rules of the American Arbitration Association.

(h) Should the Contractor fail to remedy any failure, defect, or damage described herein and not determined to be mission essential by the Contracting Officer within thirty calendar days after receipt of notice thereof, the Government shall have the right to replace, repair of otherwise remedy such failure, defect, or damage at the Contractor's expense.

(i) In addition to the other rights and remedies provided by this clause, all subcontractors', manufacturers' and suppliers' warranties expressed or implied, respecting any work and materials shall at the direction of the Government, be enforced by the Contractor for the benefit of the Government. In such case, if the Contractor's warranty as stated herein has expired, any suit, directed by the Government to enforce a subcontractor's, manufacturer's or supplier's warranty shall be at the expense of the Government. The Contractor shall obtain any warranties which the subcontractors, manufacturers, or suppliers would be given in a normal commercial practice.

(j) With respect to all warranties, express or implied, from subcontractors, manufacturers, or suppliers for work performed and materials furnished under this contract, the Contractor shall-

· Obtain all warranties that would be given in normal commercial practice:

· Require all warranties to be executed, in writing, for the benefit of the Government, if directed by the Contracting Officer; and

· Enforce all warranties for the benefit of the Government, if directed by the Contracting Officer.

· In the event the Contractor's warranty under paragraph (b) of this clause has expired, the Government may bring suit at its expense to enforce a subcontractor's, manufacturer's, or supplier's warranty.

· If directed by the Contracting Officer, the Contractor shall require any such warranties to be executed in writing to the Government.

· Notwithstanding any other provision of this clause unless such a defect is caused by negligence of the Contractor or his subcontractors or suppliers at any tier, the Contractor shall not be liable for the repair of any defects of material or design furnished by the Government nor for the repair of any damage which results from any such defect in Government furnished material or design.

(k) The warranty specified herein shall not limit the Governments right under the Contract Clause entitled: "INSPECTION OF CONSTRUCTION", with respect to latent defects, gross mistakes, or fraud.

1.50 DIGGING/EXCAVATION REQUIREMENTS

(a) Work Clearance Request. Contractor shall obtain from the MC approved form for excavation, including coordination, before beginning any work involving digging/excavation and location of buried structures and utility lines.

The Contracting Officer's Representative shall be the first and the last to coordinate on the MC approved form for excavation. The Contractor shall obtain a new permit every 14 days of digging/excavation.

(b) Location of Buried Structures and Utility Lines. Accurately locate and stake structures and utility lines indicated. Provide a drawing indicating the full extent of digging/excavation (width, depth, and length of trench or hole) and attach to the AF FORM 103. If unidentified underground utilities are encountered during excavation, notify the Contracting Officer's Representative and cease operations until they are properly identified.

(c) Excavation, Trenching, and Backfilling. Open only those trenches for which material is ready to be placed. As soon as approved by the Technical Representative, trenches shall be backfilled and tamped as required by the drawings and specifications. As a minimum, the topsoil shall be replaced and the disturbed area shall be grassed by seeding, watered and maintained for a minimum of 60 days. Stockpile excavated materials a minimum of two feet from the edge of the excavation. Mark or barricade construction work which may present a hazard.

(d) Cutting of Roads, Streets, Driveways, and Paved Areas. Repair roads, streets, and paved parking areas which require surface cutting under this project within 10 days after initial cutting. The topping shall be a minimum of 2 inches of asphalt (concrete topping on asphalt areas is not allowed). Mark, barricade, and illuminate construction work on or near roads or streets which may present a traffic hazard per OSHA 1910 and 1926. The Contractor shall provide signaling, lighting, and barricades in the construction area conforming to the Manual on Uniform Traffic Control Devices, OSHA Standards 1926.201 and 1926.202. Closures of Streets, parking lots, and other traffic areas will not be permitted unless approved by the Contracting Officer's Representative after written request 14 days before the scheduled closure.

1.51 OZONE DEPLETING CHEMICAL LIMITATION

In accordance with the National Defense Authorization Act for Fiscal Year 1993, Title III, Section 326 (Public Law 102-484), the Contractor shall not make use of, nor provide to the Government, any chemical, solvent, material, or any system making use of materials, classified as a Class I Ozone Depleting Chemical (ODC). Class I ODC's include chlorofluorocarbons (CFC's -11, -12, -113, -114, -115, -13, -111, -112, -211, -213, -214, -215, -126, and -217), carbon tetrachloride, methyl chloroform, methyl bromide, HC-140A/Methyl Chloroform, HC-10/Carbon Tetrachloride, and Halons 1211, 1301, 1202, 2402, and 1011. Contractor shall also comply with the requirements identified in section 608 of the "Clean Air Act".

Contractors working with Class I ODC refrigerants shall comply with all requirements identified in Section 603 of the Clean Air Act.

1.52 CONTRACTOR SAFETY PERSONNEL REQUIREMENT

Full-time, on-site, safety coverage by the Contractor shall be required. Refer to Section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS for project requirements.

1.53 ASBESTOS - (Occupational Health and Environment)

THE CONTRACTOR IS WARNED THAT EXPOSURE TO AIRBORNE ASBESTOS HAS BEEN ASSOCIATED WITH FOUR DISEASES: LUNG CANCER, CERTAIN GASTROINTESTINAL CANCERS, PLEURAL OR PERITONEAL MESOTHELIOMA AND ASBESTOSIS.

(a) Studies indicate there are significantly increased health dangers to persons exposed to asbestos who smoke, and further, to family members and other persons who become indirectly exposed as a result of the worker bringing asbestos contaminated work clothing home to be laundered or handled. The Contractor is advised that friable and/or nonfriable asbestos containing material has been identified in area(s) where contract work is to be performed and exists on or within materials and equipment to be removed during this project. Friable asbestos containing materials means any material that contains more than 1 percent asbestos by weight and possesses the quality that it may be crumbled, pulverized or be reduced to powder by hand pressure. Nonfriable asbestos containing materials are materials in which asbestos materials are bound by a matrix material, saturant, impregnant or coating. Nonfriable asbestos containing materials do not release airborne asbestos fibers during routine handling and end use. However, excessive fiber concentrations may be produced during uncontrolled abrading, sanding, drilling, cutting, machining, removal, demolition or other similar activities of nonfriable asbestos containing materials.

(b) Care shall be taken to avoid releasing or causing to be released asbestos fibers into the atmosphere where they may be inhaled or ingested. The occupational Safety and Health Administration (OSHA) has set standards in 29 CFR 1926.58 for occupational exposure to airborne concentrations of asbestos fibers in the construction industry. These standards define permissible exposure limits, methods of compliance, personal protective equipment including clothing and respiratory protection, hygiene facilities and practices, establishment of regulated removal areas, employee information and training, exposure monitoring of airborne asbestos, signs and labels warning of asbestos hazards, housekeeping methods for fiber control and waste disposal, medical surveillance programs and record keeping of medical and exposure monitoring data. The environmental Protection Agency (EPA) has established standards in 40 CFR 61.140-156 (SUBPART M) for the control of asbestos emissions to the environment and the handling and disposal of asbestos waste. These standards define EPA notification that such removal is to take place. The required work practices and procedures include wetting, containment, container labeling, and disposal of removed materials in an approved sanitary landfill.

(c) When contract work activities are carried out in locations where the potential exists for exposure to airborne asbestos fibers as described in 1(b) or where asbestos waste will be generated, the Contractor shall ensure that all measures necessary to provide effective protection to persons from exposure to asbestos fibers and prevention of contamination to property, materials, supplies, equipment and the internal and external environment are effectively instituted. As a minimum the Contractor shall comply with the provisions of OSHA (29 CFR 1926.58), EPA (40 CFR 61.140-156), DOT (49 CFR 172.101; and any state or local regulation applicable to safety and health, emission control and transportation and disposal requirements for asbestos.

In addition to complying with the above regulations, the Contractor shall perform all asbestos removal and disposal operations in accordance with the

requirements as set forth in the technical specifications. If the Contractor or any subcontractor identifies or encounters any suspect asbestos material (asbestos content greater than 1 percent by weight) not otherwise identified by the scope of work in the first clause during pre-construction, construction or post construction work activities in locations where contract work is to be performed, the Contractor shall immediately notify the Contracting Officer or COTR verbally with the follow-up in writing within 24 hours.

1.54 REQUIREMENTS FOR TEMPORARY CRANES

(a) All cranes used by the Contractor for construction purposes will require written acceptance for their use by the Contracting Officer's representative. All requests shall be made sixty (60) days in advance of the crane's arrival on the job site and shall include such information as total operating height, mode of transportation and delivery to the project site, period of use and methods of conforming to all safety and airfield operations procedures. Cranes operating at night shall require a red blinking light at the highest point on the crane boom which conforms to Federal Aviation Administration (FAA) requirements . FAA Form 7460-1 shall be completed by the Contractor and filed with the FAA. A copy of Form 7460-1 shall also be submitted to the Contracting Officer's representative. When not in operation, crane booms shall be in the lowered position. Contractor is responsible for obtaining all necessary FAA Permits for erection of temporary structures.

(b) Address to submit FAA Form 7460-1 is:

Federal Aviation Administration
Southern Regional Office
Air Traffic Division, ASO-530
P.O. Box 20636
Atlanta, GA 30320

(c) Address of the Southern Region Office is:

Southern Region Office
Air Traffic Division, ASO-530
1710 Columbia Avenue
College Park, GA 30337
Tel. 404-305-5585

1.55 SAFETY MARKINGS ON CRANE BOOMS

All cranes shall have a red strobe light and two flags attached to the end of the boom. The flags shall be 18-inches square and international orange in color. The strobe does not need to be flashing during daylight hours or when the boom is lowered to the ground at night. The strobe shall be flashing when operating during weather in which visibility is reduced or when operating at night. The strobe shall remain flashing if the boom remains elevated at night.

1.56 CERTIFICATES OF COMPLIANCE

(Refer to Section 00800, paragraph 952.000-4309)

1.57 TEMPORARY ELECTRICAL SERVICE

All temporary electrical service on the project, and within all temporary and permanent structures shall be installed and maintained in compliance with the provisions of EM 385-1-1, latest edition, Corps of Engineers Safety and Health Requirements, and APPENDIX T of Mobile District Regulation 385-1-1, Electrical Service Requirements for Construction and Maintenance Operations. Copies of these publications are available for inspection in the District Office by Prospective bidders, and will be furnished to the successful bidder.

1.58 SCHEDULE OF AVAILABLE UTILITIES

In accordance with Section 00700 of the parent contract, paragraph entitled "Availability and Use of Utility Services", the Government will make available at no cost to the Contractor, electricity and water from existing distribution lines, outlets and supplies. It shall be the Contractor's responsibility to install and maintain all necessary temporary connections and distribution lines for his own use. Any other required utilities shall be furnished by the Contractor.

1.59 ASBESTOS MATERIALS AND LEAD BASED PAINTS

The Contractor shall not use materials containing Asbestos or Lead Based Paints in the construction of this facility.

Upon completion of the construction, the Contractor shall submit two copies of a Certified Letter to the Contracting Officer's Representative (COR) stating that no lead based paints or materials containing asbestos were used in the construction of the new facilities. One copy of the letter will be filed with project documents in the Resident Engineer's Office. The COR will deliver the remaining copy to the Base Environmental Office.

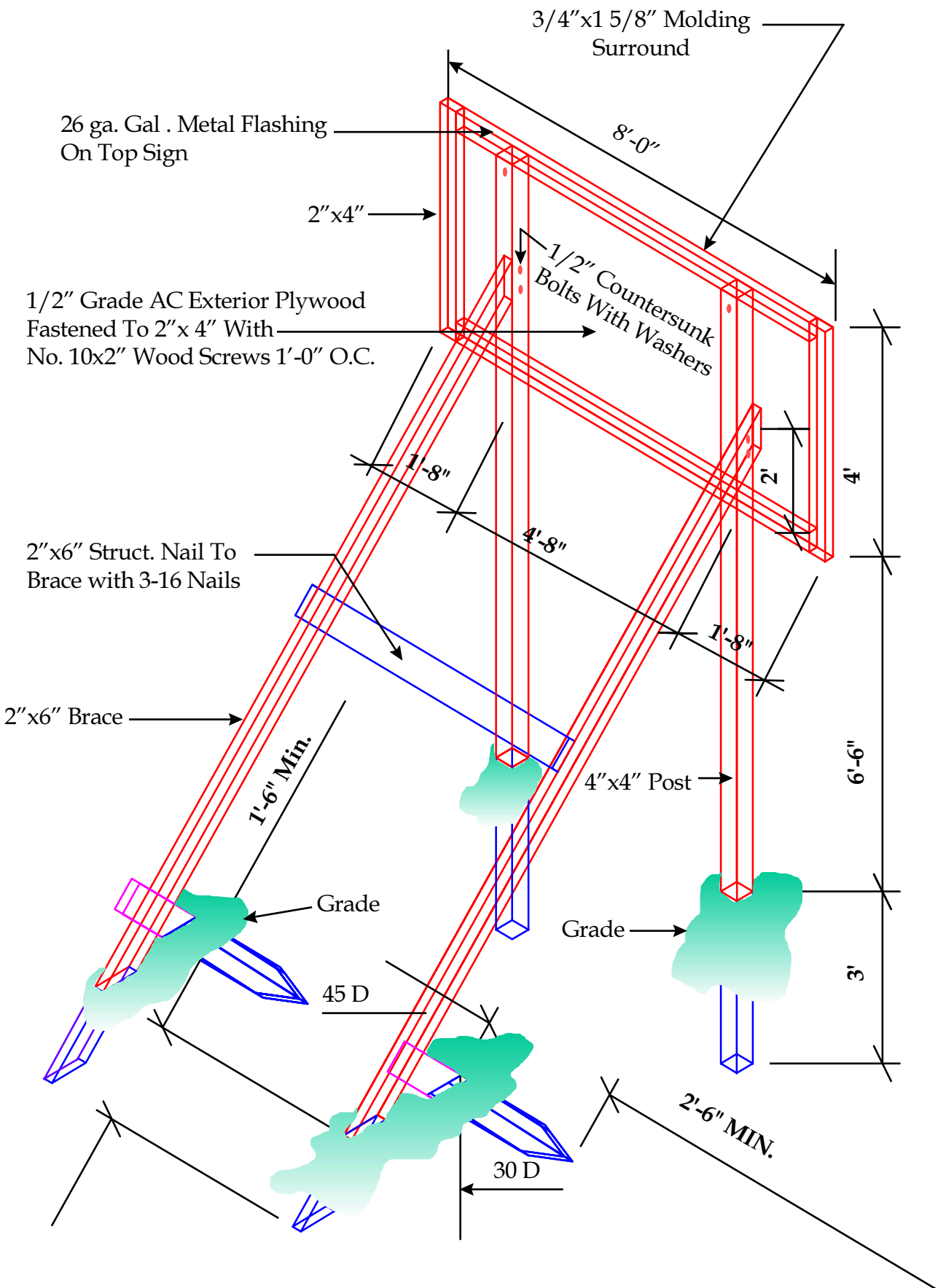
1.60 RATES OF WAGES

Wage rates follow the end of this section.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

-- End of Section --



AIR FORCE SIGN ISOMETRIC ERECTION DETAILS

Fig 4e

Each contrrator's safety record is to be posted on Corps managed or supervised construction projects and mounted with the construction project identification sign.

The graphic format, color, size and type-faces used on the sign are to be reproduced exactly as specified below. The title with First Aid logo in the top section of the sign and the performance record captions are standard for all signs of the type. Legend Groups 2 and 3 below identify the project and the contractor and are to be placed on the sign as shown.

Safety record numbers are mounted on individual metal plates and are screwmounted to the background to allow for daily revisions to posted safety performance record.

Legend Group 1: Standard two-line title "Safety is a Job requirement" with (8 od.) Safety Green First Aid logo.
Color: to match PMS 347
Typeface: 3" Helvetica Bold
Color: Black

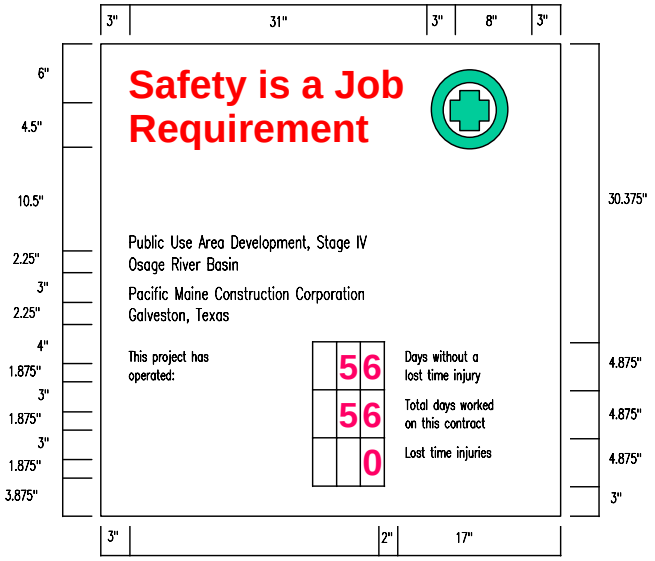
Legend Group 2: One to two-line project title legend describes the work being done under this contract and name of host project.
Color: Black
Typeface: 1.5" Helvetica Regular
Maximum line length: 42"

Legend Group 3: One to two-line identifation: name of prime contractor and city, state address.
Color: Black
Typeface: 1.5" Helvetica Regular
Maximum line length: 42"

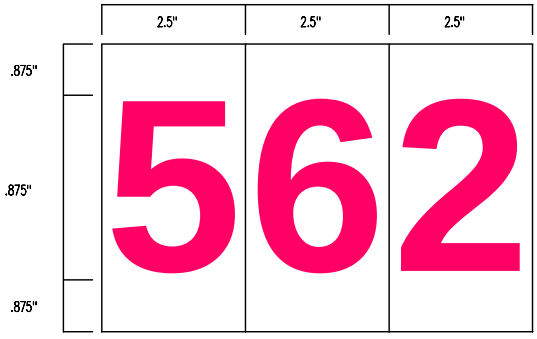
Legend Group 4: Standard safety record capitons as shown.
Color: Black
Typeface: 12.5" Helvetica Regular

Replaceable numbers are to be mounted on white .060 aluminum plates and screw-mounted to background.
Color: Black
Typeface: 3" Helvetica Regular
Plate size: 2.5" x .5"

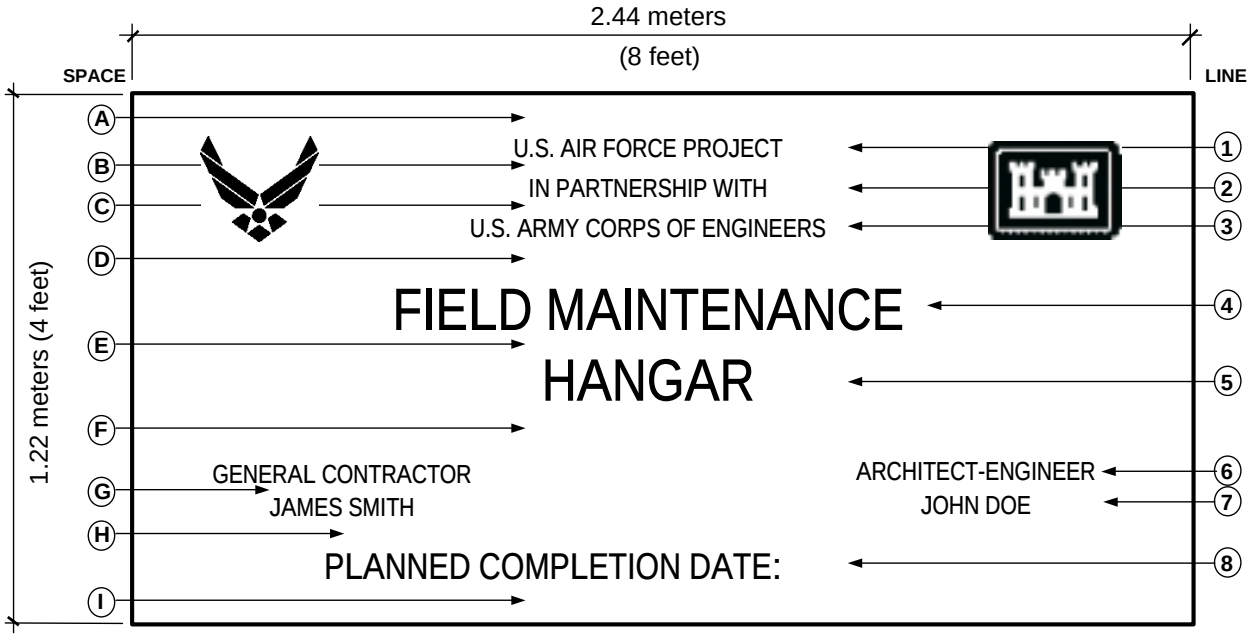
All typography is flush left and rag right. Upper and lower case with initial capitals only as shown. Letter- and word-spacing to follow Corps standards.



Sign Type	Legend Size	Panel Size	Post Size	Specification Code	Mounting Height	Color Bkg/Lgd
CID-02	various	4"x4"	4"x4"	HDO-3	48"	WH/BK-GR



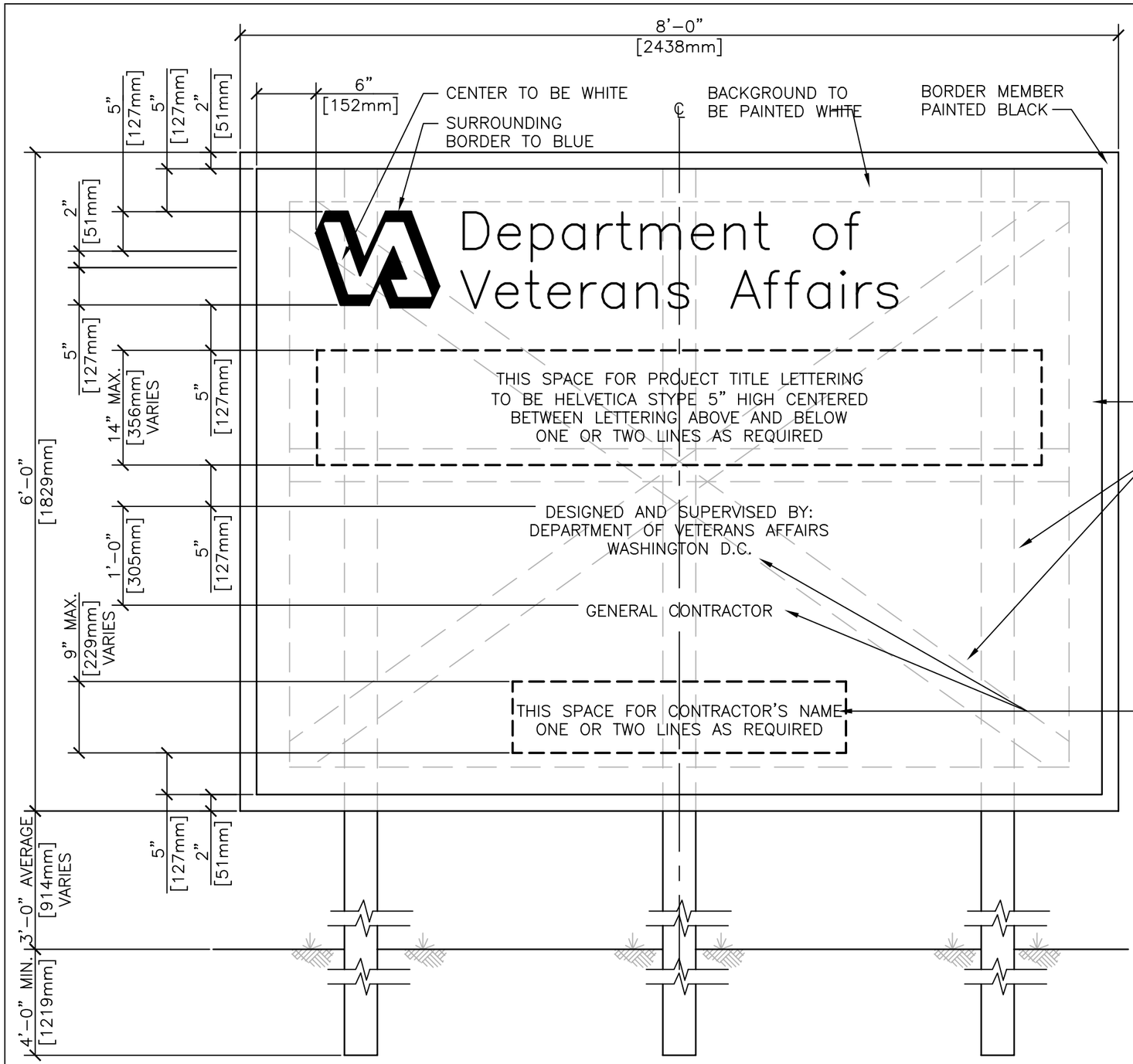
SAFETY PERFORMANCE SIGN



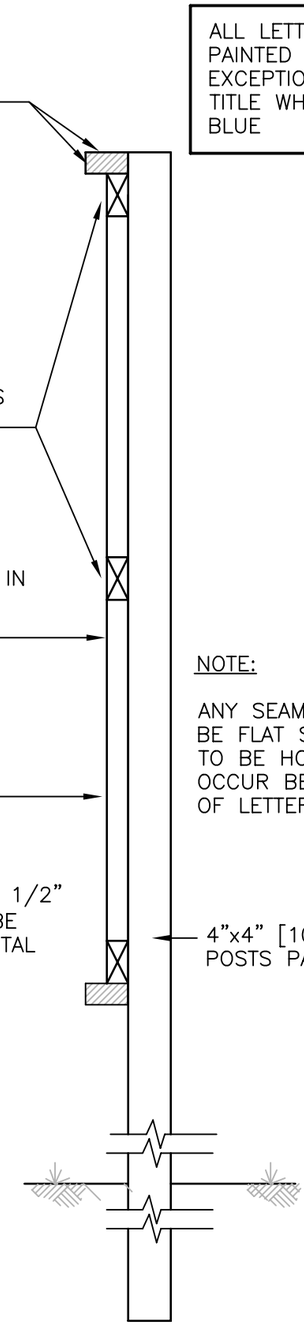
Space	Height	Line	Description	Letter Height	Stroke
A	102 mm (4 in)	1	U.S. AIR FORCE PROJECT	38 mm (1.5 in)	5 mm (0.1875 in)
B	51 mm (2 in)	2	IN PARTNERSHIP WITH	38 mm (1.5 in)	5 mm (0.1875 in)
C	51 mm (2 in)	3	U.S. ARMY CORPS OF ENGINEERS	38 mm (1.5 in)	5 mm (0.1875 in)
D	127 mm (5 in)	4	PROJECT NAME	102 mm (4 in)	13 mm (0.5 in)
E	76 mm (3 in)	5	PROJECT NAME CONT'D (IF REQUIRED)	102 mm (4 in)	13 mm (0.5 in)
F	127 mm (5 in)	6	GENERAL CONTRACTOR/A-E	38 mm (1.5 in)	5 mm (0.1875 in)
G	25 mm (1 in)	7	GENERAL CONTRACTOR/A-E	38 mm (1.5 in)	5 mm (0.1875 in)
H	102 mm (4 in)	8	PLANNED COMPLETION DATE	63 mm (2.5 in)	6 mm (0.25 in)

Figure 1. Construction Sign Example

6.5. Paint the sign with one coat of primer paint followed by two coats of gloss exterior-type enamel paint. The color must be either Standard Blue 15090 or Standard Brown 10100 as specified in Federal Standard (FED-STD) 595B, *Colors*, Volume 1. Lettering is to be as shown in Figure 1 in white gloss, exterior-type enamel.



ELEVATION



SECTION ON CENTERLINE

ALL LETTERING TO BE PAINTED BLACK WITH EXCEPTION OF PROJECT TITLE WHICH IS TO BE BLUE

NOTE:

ANY SEAM IN METAL TO BE FLAT SEAM – SEAMS TO BE HORIZONTAL AND OCCUR BETWEEN LINES OF LETTERING.

CONSTRUCTION SIGN

NTS

DETAIL TITLE / CONSTRUCTION SIGN

SCALE :NONE

DATE ISSUED: DECEMBER 2008

CAD DETAIL NO.: SD010000-1.DWG

Department of Veterans Affairs

ELEVATION

SAFETY SIGN

NTS

DETAIL TITLE / SAFETY SIGN

SCALE :NONE

DATE ISSUED: DECEMBER 2008

CAD DETAIL NO.: SD010000–02.DWG

Department of Veterans Affairs

SECTION 01 00 01.02

CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN (CEMP)

Department of Veterans Affairs

Phase 4 New Bed Tower and Infrastructure Improvements Project

James A. Haley Veterans' Hospital and Clinics, Tampa, Florida

Bart Bruchok	**Joe D. Battle**
Project Executive	**Director, James A. Haley Veterans' Hospitals and Clinic**
Vic Verma, P.E., M. B. A., M. E.	
Environmental Engineer	**Project Officer, Corps of Engineer**

65% SUBMITTAL

PART 1 – GENERAL

1. GENERAL

1.1. PURPOSE

1.1.1. This Construction Environmental Management Plan (CEMP) outlines business processes in support of VA Directive 0057 for VA's Phase 4 Bed Tower and Infrastructure Project at James A. Haley Veterans' Hospital in Tampa, Florida. This CEMP identifies environmental objectives, establishes procedures, responsibilities, and accountability for specific key offices/officials and stakeholders for achieving and maintaining environmental compliance and problem resolution to limit potential impacts to the environment, protected resources and communities within and abutting the Project area.

1.1.2. This CEMP is a living document that will be developed as design and construction progresses and if additional environmental issues are identified. Periodic review of this CEMP will be performed to ensure continual improvement of the plan's adequacy and it will be expanded and updated during the project duration. This CEMP is intended to be flexible and tailored to match highly variable construction activities and locations throughout the Project.

1.2. POLICY

1.2.1. VA will meet or exceed the requirements of all applicable executive orders and Federal, state, and local environmental laws and regulations (Source-VA Directive 0057, Environmental Management Program, para 1e).

1.3. ENVIRONMENTAL OBJECTIVES OF PROJECT

1.3.1. Comply with all applicable Federal, state, local, and VA's environmental requirements;

1.3.2. Minimize number of modifications due to environmental requirements; and

1.3.3. Minimize cost overruns attributed to environmental requirements.

1.4. REFERENCES

The publications listed below form a part of this CEMP to the extent referenced. The publications are referred to within the text by the basic designation only. The construction contractor is responsible for compliance with additional applicable Federal, state and local requirements when those are not included below.

1.4.1. Legislation

1.4.1.1. Archaeological and Historic Preservation Act (16 U.S.C. Section 469 et seq.)

1.4.1.2. Archaeological Research Protection Act of 1979 (16 U.S.C. Sections 470aa – 470-mm)

1.4.1.3. American Indian Religious Freedom Act (42 U.S.C. Section 1996 et seq.)

1.4.1.4. Clean Air Act (42 U.S.C. Section 7401 et seq.)

1.4.1.5. Clean Water Act (Federal Water Pollution Control Act) (33 U.S.C. Section 1251 et seq.)

1.4.1.6. Coastal Zone Management Act (CZMA) (16 U.S. C. 1451 et seq.)

1.4.1.7. Comprehensive Environmental Response, Compensation, and Liability Act (42 U.S.C. Section 9601 et seq.)

1.4.1.8. Endangered Species Act (16 U.S.C. Section 1531 et seq.)

1.4.1.9. Emergency Planning and Community Right-to-Know Act (EPCRA) (40 CFR 350-372)

1.4.1.10. Farmland Protection Policy Act (7 U.S.C. Section 4201 et seq.)

1.4.1.11. Federal Facilities Compliance Act (FFCA)

1.4.1.12. Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) (7 U. S. C. Section 136-136y)

1.4.1.13. Federal Environmental Pesticide Act (FEPCA)

1.4.1.14. Federal Food, Drug, and Cosmetic Act (FFDCA) (21 U. S. C. Chapter 9, Section 301 et seq.)

1.4.1.15. Food Quality Protection Act (FQPA) (7 U. S. C. Chapter 6, Section 135 et seq.)

1.4.1.16. Marine Mammal Protection Act (MMPA) (16 U. S. C. Chapter 31)

1.4.1.17. Migratory Bird Treaty Act (MBTA) (16 U. S. C. Section 703-712)

1.4.1.18. National Environmental Policy Act (42 U.S.C. Section 4341 et seq.)

1.4.1.19. National Historic Preservation Act (16 U.S.C. Section 470 et seq.)

1.4.1.20. Native American Graves Protection and Repatriation Act (NAGPRA) (43 CFR 10)

1.4.1.21. Noise Control Act (42 U.S.C. Section 4901 et seq.)

1.4.1.22. Resource Conservation and Recovery Act (42 U.S.C. Section 6901 et seq.)

1.4.1.23. Rivers and Harbors Act (33 U.S.C. Section 401 et seq.)

1.4.1.24. Safe Drinking Water Act (42 U.S.C. Section 300 et seq.).

1.4.1.25. Toxic Substances Control Act (15 U.S.C. Section 2601 et seq.)

1.4.1.26. Wild and Scenic Rivers Act (16 U.S.C. Section 1271 et seq.)

1.4.2. Regulations

1.4.2.1. 36 CFR 800 et seq., Protection of Historic Properties, Regulations Issued by Advisory Council on Historic Preservation (ACHP) Governing Implementation of Section 106 of National Historic Preservation Act (NHPA)

1.4.2.2. 40 CFR 1500-1508, Council on Environmental Quality (CEQ), Regulations Issued by CEQ Governing National Policy Act (NEPA)

1.4.2.3. 7 CFR 658, et seq., U.S. Department of Agriculture, Regulations for Implementing the Farmland Protection Policy Act, http://www.gpo.gov/fdsys/granule/CFR-2010-title7-vol6/CFR-2010-title7-vol6-part658/content-detail.html .

1.4.2.4. 38 CFR 26 et seq., U.S. Department of Veterans Affairs, Environmental Effects of the Department of Veterans Affairs (VA) Actions, http://cfr.regstoday.com/38cfr26.aspx

1.4.2.5. 40 CFR 50 et seq., U.S. Environmental Protection Agency, Clean Air Act Implementing Regulations

1.4.2.6. 40 CFR Parts 51 and 52, U.S. Environmental Protection Agency, Prevention of Significant Deterioration for Particulate Matter

1.4.2.7. 40 CFR 125, et seq., U.S. Environmental Protection Agency, Clean Water Act (CWA), Criteria and Standards for the National Pollutant discharge Elimination system

1.4.2.8. 40 CFR 61, et seq., U.S. Environmental Protection Agency, National Emission Standards for Hazardous Air Pollutants

1.4.2.9. 40 CFR Part 141 et seq., U.S. Environmental Protection Agency, National Interim Primary Drinking Water Regulations (Safe Drinking Water Act)

1.4.2.10. 40 CFR Part 143 et seq., U.S. Environmental Protection Agency, National Secondary Drinking Water Regulations (Safe Drinking Water Act)

1.4.2.11. 40 CFR Parts 260 et seq., U.S. Environmental Protection Agency, Resource Conservation and Recovery Act (RCRA)

1.4.2.12. 10 CFR Part 20, U.S. Nuclear Regulatory Commission, Standards for Protection Against Radiation

1.4.3. Executive Orders (EO)

1.4.3.1. E.O. 11988, Floodplain Management

1.4.3.2. EO 11990, Protection of Wetlands

1.4.3.3. EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations

1.4.3.4. EO 13006, Locating Federal Facilities on Historic Properties on Our Nation's Central Cities

1.4.3.5. EO 13007, Indian Sacred Sites

1.4.3.6. EO 13175, Indian Tribes

1.4.3.7. EO 13287, Preserve America

1.4.3.8. EO 13423, Strengthening Federal Environmental, Energy, and Transportation Management

1.4.3.9. EO 13514, Federal Leadership in Environmental, Energy, and Economic Performance

1.4.4. EPA Manuals

1.4.4.1. Managing Your Environmental Responsibilities: A Planning Guide for Construction and Development, http://www.cicacenter.org/links

1.4.5. VA Orders and Directives (Available at : http://www1.va.gov/vapubs/search_action.cfm?dType=1)

1.4.5.1. 0055, VA Energy and Water Management Program

1.4.5.2. 056, VA Sustainable Buildings Program

1.4.5.3. 0057, VA Environmental Management Program

1.4.5.4. 0058, VA Green Purchasing Program

1.4.5.5. 0059, VA Chemicals Management and Pollution Prevention

1.4.5.6. 0062, Environmental Compliance Management

1.4.5.7. 0063, Waste Prevention and Recycling Program

1.4.5.8. 0064, VA Environmental Management Systems

1.4.5.9. 0067, VA National Environmental Policy Act Implementation

1.4.6. VA Handbooks (Available at : http://www1.va.gov/vapubs/search_action.cfm?dType=1)

1.4.6.1. 0056, VA Sustainable Buildings Program

1.4.6.2. 0058, VA Green Purchasing Program

1.4.6.3. 0059, VA Chemicals Management and Pollution Prevention

1.4.6.4. 0062, Environmental Compliance Management

1.4.6.5. 0063, Waste Prevention and Recycling Program

1.4.6.6. 0064, VA Environmental Management Systems

1.4.7. VA Guidance

1.4.7.1. PG-18-17, NEPA Interim Guidance for Projects

1.4.8. VA Manual

1.4.8.1. Asbestos Abatement Design Manual, July 2011

1.4.9. VA Specifications

Available on a FTP site at http://downloads.va.gov/files/CFM-TIL/spec/currentSpecs/

1.5. DEFINITIONS

1.5.1. Cleanup Operations

A non-emergency operation where hazardous substances or oil are removed, contained, incinerated, neutralized, stabilized, cleared up, or in any other manner processed or handled with the ultimate goal of making the site safer for people or the environment. A cleanup operation may be a post-emergency spill response or may be a cleanup action without being preceded by an emergency phase.

1.5.2. Contractor

A contractor, who has a contract from VA for performing work during the Project's construction phase,

1.5.3. Contractor Generated Hazardous Waste

Contractor generated hazardous waste means materials that, if abandoned or disposed of, may meet the definition of a hazardous waste. These waste streams would typically consist of material brought on site by the Contractor to execute work, but are not fully consumed during the course of construction. Examples include, but are not limited to, excess paint thinners (i.e. methyl ethyl ketone, toluene etc.), waste thinners, excess paints, excess solvents, waste solvents, and excess pesticides, and contaminated pesticide equipment rinse water.

1.5.4. Cultural Resource

Cultural resource, as used here, includes all aspects of the human environment that have historical, architectural, archaeological, or cultural significance, including, but not limited to historic properties, archaeological resources and data, Native American ancestral remains and cultural items, religious places and practices, historical objects and artifacts, historical documents, and community identity.

1.5.5. Discharge

A discharge does not include those authorized by a legal permit, but includes, but are not limited to, any spilling, leaking, pumping, pouring, emitting, emptying, or dumping.

1.5.6. Emergency Spill Response

Emergency spill response refers to the response to a spill of oil or a hazardous substance that poses an immediate or potentially immediate threat to persons, property or the environment. The purpose of the response is to prevent the spill from entering or continuing to enter the environment. Once under control where the oil or substance is no longer an immediate threat to persons, property or the environment, the spill response becomes a non-emergency spill cleanup.

1.5.7. Environmental Activities

Environmental activities include all projects, studies, analyses, monitoring, and operational involvement of VA operations where the objective is pollution abatement and/or improvement of environmental quality. Included are such activities as environmental assessments, environmental impact statements, construction and operational permits, air and water quality modeling and monitoring systems, ecological baselining, plant operations, effluent monitoring, sanitary landfill, and pesticide applications.

1.5.8. Environmental Compliance

The environmental compliance mission is to assure that all VA facilities and associated lands (including out grants) meet all applicable and appropriate environmental standards contained in relevant Executive Orders, VA Directives and Guidance documents, Federal, state and local laws and regulations. These requirements include but are not limited to: Federal Facilities Compliance Act (FFCA); Clean Air Act (CAA); Clean water Act (CWA); Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); Emergency Planning and Community Right-to-Know Act (EPCRA); Endangered Species Act (ESA); Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA); Hazardous Materials Transportation Act (HMTA); National Environmental Policy act (NEPA); Noise Control Act (NCA); Oil Pollution Act of 1990 (OPA); Resource Conservation and Recovery Act (RCRA); Safe Drinking water Act (SDWA); Toxic Substance Control Act (TSCA); National Historic Preservation Act (NHPA). For additional information see EPA's publication titled, "The Yellow Book: Guide to Environment and Compliance at Federal Facilities" at: https://www.orau.org/PTP/PTP%20Library/library/EPA/miscelaneous/yellowbk/yellowbk.pdf . A primer for complying with environmental requirements and understanding the enforcement and compliance processes used by EPA at federal facilities is provided at: http://www.epa.gov/enforcement/enforcement-and-compliance-federal-facilities

1.5.9. Environmental Pillars

Environmental pillars symbolize major components of environmental management. VA has four environmental pillars: (1) Environmental

Planning; (2) Environmental Compliance; (3) Pollution Prevention; and (4) Environmental Restoration.

1.5.10. Environmental Planning

Environmental planning is compliance with the legal requirements of the cultural resources and the National Environmental Policy Act (NEPA). The NEPA sets forth broad government policy to preserve and manage the human environment, including the natural and built environments and the relationship of people to these environments. VA's general procedures for NEPA compliance are at 38 CFR 26. Among the aspects of the human environment that must be considered when complying with the NEPA are "historic and cultural resources: (40 CFR 1508.27(b)(3), (b)(8)).

1.5.11. Environmental Pollution and Damage

Environmental pollution and damage is the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade the environment aesthetically, culturally and/or historically.

1.5.12. Environmental Protection

Environmental protection is the prevention/control of pollution and habitat disruption that may occur to the environment during construction. The control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

1.5.13. Environmental Restoration

Environmental restoration refers to cleanup of contamination on VA facilities.

1.5.14. Hazardous Material

Any material designated as a "hazardous material" pursuant to 49 CFR 172, or any material defined as hazardous under 29 CFR 1910.120(c) and includes material presenting health and/or physical hazard; such material has one or more toxic, flammable, corrosive, or reactive properties. All hazardous materials are hazardous substances, except oil.

1.5.15. Hazardous Substance

Any substance designated as a "hazardous substance" pursuant to 40 CFR Part 302. For the purposes of this document, references to

"hazardous substance" include any hazardous chemical and extremely hazardous substance.

1.5.16. Hazardous Waste

Hazardous waste is designated as a "hazardous waste" pursuant to 40 CFR 260-261. A hazardous waste is a waste or combination of wastes that can pose a substantial or potential hazard to human health or the environment when not properly managed; possesses at least one of four characteristics (ignitable, corrosive, reactive, or toxic) or appears on special EPA lists; includes toxic waste, spilled materials, and unused chemicals. All hazardous wastes are hazardous materials, and therefore hazardous substances.

1.5.17. GEMS Coordinator

A VA program manager, who serves as technical authority in environmental issues and has responsibility for assuring adequacy of the Medical Center's Green Environmental Management System (GEMS) program,

1.5.18. Land Application for Discharge Water

The term "Land Application" for discharge water implies that the Contractor must discharge water at a rate which allows the water to percolate into the soil. No sheeting action, soil erosion, discharge into storm sewers, discharge into defined drainage areas, or discharge into the "waters of the United States" must occur. Land Application must be in compliance with all applicable Federal, state, and local laws and regulations.

1.5.19. Pesticide

Pesticide is defined as any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest, or intended for use as a plant regulator, defoliant or desiccant.

1.5.20. Pests

The term "pests" means arthropods, birds, rodents, nematodes, fungi, bacteria, viruses, algae, snails, marine borers, snakes, weeds and other organisms (except for human or animal disease-causing organisms) that adversely affect VA's operations, or the well-being of personnel and animals; attack or damage real property, supplies, equipment, or vegetation; or are otherwise undesirable.

1.5.21. Pollution Prevention

"Source reduction" as defined in the Pollution Prevention Act of 1990 (42 U.S.C. 13102), and other practices that reduce or eliminate the creation of pollutants through: (1) increased efficiency in the use of raw materials,

energy, water, or other resources, or (2) the protection of natural resources by conservation.

1.5.22. Project

Project refers to Phase 4 New Bed Tower and Infrastructure Project at James A. Haley Veterans' Hospital, Tampa, Florida.

1.5.23. Recycling

The series of activities, including collection, separation, and processing, by which products or other materials are recovered from the solid waste stream for use in the form of raw materials in the manufacture of new products other than fuel for producing heat or power by combustion.

1.5.24. Release

Release refers to any spilling, leaking, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment of any hazardous chemical, extremely hazardous substance, or CERCLA hazardous substances.

1.5.25. Reportable Quantity

The quantity of a spilled hazardous substance specified in 40 CFR 302 at which the facility spilling that substance becomes subject to certain notification requirements.

1.5.26. Spill

Spill refers to the accidental or the deliberate but unpermitted discharge or release of reportable quantities of oil or a hazardous substance.

1.5.27. Sustainable

Of or pertaining to creating and maintaining conditions under which humans and nature can exist in productive harmony, that permit fulfilling the social, economic, and other requirements of present and future generations of Americans.

1.5.28. Surface Discharge

The term "Surface Discharge" implies that the water is discharged with possible sheeting action and subsequent soil erosion may occur. Waters that are surface discharged may terminate in drainage ditches, storm sewers, creeks, and/or "waters of the United States" and would require a permit to discharge water from the governing agency.

1.5.29. Waters of the United States

All waters which are under the jurisdiction of the Clean Water Act, as defined in 33 CFR 328.

1.5.30. Wetlands

Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, and bogs. Official determination of whether or not an area is classified as a wetland must be done in accordance with Corps of Engineers Wetlands Delineation Manual (http://el.erdc.usace.army.mil/elpubs/pdf/wlman87.pdf)

1.6. PROJECT INFORMATION

1.6.1. The Project includes the New South Bed Tower, a six level, 220,000 gross square feet (GSF) bed tower connected to the east side of Building 1 (Figures 5 and 6 in the SEA). The tower would contain 100 Medical, Surgical and Nursing (MS&N) inpatient beds, 40 intensive care unit (ICU) beds, associated support space, lobby, public amenities, Main Security Office, patient drop-off and entry, and connection to Building 1. The New South Bed Tower would serve as the new main entry for the hospital. Site work and utilities associated with construction of the new tower would be necessary, including reconfiguration of the existing Diamond surface parking lot and a new entry drive.

1.6.2. The New South Bed Tower will be state-of-the-art, meeting all current VA and industry standards for size, function, and infrastructure. It would be designed to maximize programmatic flexibility and anticipate future trends in healthcare design. Quality of care would be enhanced by allowing for the most efficient unit sizes and providing optimal adjacencies between spaces. For example, the standard 24-bed MS&N units would be located adjacent to their companion ICU bed units to promote patient and staff safety by minimizing patient movement.

1.6.3. The New South Bed Tower would allow the existing Building 1 bed tower to undergo a less costly and more programmatically-appropriate future renovation, providing outpatient diagnostic and testing services and support functions that serve the hospital. The New South Bed Tower is also intended to serve as the new main entry for the hospital, improving campus wayfinding and patient access, as well as presenting a new "face" to the Tampa Bay community and reaffirming the VA's commitment to caring for our Nation's heroes at the highest level.

1.6.4. A Satellite Central Utility Plant (CUP) is considered necessary when renovation of the existing plant (Building 39) would be problematical.

1.7. PROJECT STATUS

This project is a design-build (DB) project. A FONSI and Supplementary Environmental Assessment have been completed. A-E, HDR, has prepared a Request for Proposal (RFP) for selection of a DB contractor.

PART 2 - RESPONSIBILITIES

2. STAKEHOLDERS

VA recognizes that achieving successful environmental compliance lies with every VA employee. VA is actively working to ensure that every person is aware of his or her role in the success of this effort. The Project will be built through the concerted efforts of various organizations and responsible parties who will work together providing multiple levels of oversight to ensure a successful outcome. The following organizations will work toward the common goal of successfully completing the Project, achieving the expectations of the State of Florida and local agencies while satisfying Federal and VA environmental requirements.

- James A. Haley Veterans' Hospital, Tampa, Florida (Tampa VAMC)
- VA Office of Construction and Facilities Management (CFM) Central Office (VACO)
- CFM Tampa Project Office
- CFM Eastern Region Office (ERO) – Silver Spring, MD
- CFM Consultant (HDR)
- Corps of Engineers (COE)
- Construction Contractor (Contractor)

2.1. James A. Haley Veterans' Hospital, Tampa, Florida (Tampa VAMC):

2.1.1. Tampa VAMC director will:

2.1.1.1. Sign permit applications and correspondences to regulators;

2.1.1.2. Concur with the final design engineering of the project.

2.1.1.3. Delegate certain authority when it is in the best interest of VA.

2.1.1.4. Designate a management representative for project coordination;

2.1.1.5. Designate a GEMS coordinator for environmental coordination.

2.1.2. Tampa VAMC GEMS Coordinator will:

2.1.2.1. Concur with environmental plans and procedures for implementation at Tampa VAMC;

2.1.2.2. Concur with permit applications and correspondences to regulators and obtain signatures of authorized VAMC persons on these documents;

2.1.2.3. Sign manifests for hazardous waste shipment;

2.1.2.4. Conduct or direct investigation of all reportable spills and Notice(s) of Violations and concur with the corrective actions proposed.

2.2. VA Office of Construction and Facility Management Office – Central Office (VACO)

2.2.1. VACO and its consultants are responsible for review and approval of Preliminary and Final Engineering of the entire Project. A number of divisions in the CFM will participate in the Project review, including, but not limited to, the CFM Eastern Region Office (ERO), CFM Tampa Project Office, and the CFM Consultant Support Services (CSS).

2.2.2. VACO is responsible for programming, budget request and reporting of project status and financial data to the VA Office of Management (OM) and organizations outside of VA.

2.2.3. Provide technical review and contract support;

2.2.4. Associate Executive Director, Office of Operations, will designate a Project Executive, who will be located in CFM Tampa office in in Tampa VAMC.

2.3. VA CFM Tampa Project Office

2.3.1. Project Executive will:

2.3.1.1. Serve as VA's Action Officer, liaison, and gatekeeper of all communication amongst VA, COE, and Tampa VAMC;

2.3.1.2. Supervise project manager and project staff;

2.3.1.3. Identify environmental duties and performance measures of subordinate staff and require them to take environmental training commensurate to their duties;

2.3.1.4. Maintain visibility of environmental issues;

2.3.2. Project Manager will:

2.3.2.1. Keep Project Executive, ERO environmental engineer and Tampa VAMC informed of status of environmental issues and actions taken/planned;

2.3.2.2. Assure that this CEMP and required master specifications are incorporated into the Request for Proposal;

2.3.2.3. Obtain concurrence/ approval of Final Engineering and other documents from Tampa VAMC, COE, ERO, and VACO; and

2.3.2.4. Seek advice and staff assistance of ERO environmental engineer and comply with recommendations provided.

2.4. VA Office of Construction and Facility Management Regional Office – East, Silver Spring, MD (ERO)

2.4.1. ERO Regional Director will:

2.4.1.1. Provide a Project Manager, who will report to Project Executive;

2.4.1.2. Provide services on call basis of ERO Environmental Engineer.

2.4.2. ERO environmental engineer will:

2.4.2.1. Serve as a Subject Matter Expert on environmental matters;

2.4.2.2. Lead a VA team in the development of a Supplementary Environmental Assessment and Finding of No Significant Impact (FONSI);

2.4.2.3. Lead a VA team in the development of the VA's Environmental Construction Management Plan for project;

2.4.2.4. Render advice on environmental matters;

2.4.2.5. Provide site assistance visits and staff advisory services on environmental matters;

2.4.2.6. Concur with environmental plans and procedures for Project;

2.4.2.7. Concur with correspondences to regulators on environmental matters; and

2.4.2.8. Provide environmental awareness training to Project Executive and staff.

2.5. CFM Consultant: CFM Consultant (HDR) will:

2.5.1. Prepare a Request for Proposal (RFP) for project; and

2.5.2. Provide project support until selection of a Design Bid contractor.

2.6. Corps of Engineers (COE): COE is responsible for execution of the project from design through project completion. COE will designate a Project Officer, who will serve as Action Officer and Liaison between COE and VA for the Project.

2.6.1. COE's Project Officer will:

2.6.1.1. Coordinate project activities and assure that all project related communication between COE and VA is through VA's Project Executive and COE Project Officer, unless directed by VA otherwise;

2.6.1.2. Validate that VA's prior environmental commitments are carried out in the final design and during construction of the Project;

2.6.1.3. Assure that the contract language explicitly states that the Contractor is responsible for compliance with all Federal, state, and local environmental regulations and VA's plans and procedures;

2.6.1.4. Obtain concurrence of VA's Project Executive for all environmental plans and procedures before implementation in the Project;

2.6.1.5. Designate a Resident Engineer (RE) for the Project;

2.6.2. COE Project Officer and its subject matter experts or consultants will provide adequate support to Resident Engineer for environmental program management;

2.6.2.1. Assure that subject matter experts in COE or its consultants review environmental and safety related plans and procedures, that includes, but

are not limited to, Health and Safety Plans, waste manifests, Storm Water Pollution Prevention Plan, Contractor's Environmental Protection Plan, etc.;

2.6.2.2. Assure accuracy and adequacy of information in permit applications, correspondences to regulators, manifests, plans and other documents before recommending these for signatures of authorized persons in Tampa VAMC;

2.6.2.3. Assure accuracy and adequacy of Notice(s) of Deficiencies to the contractor and verify proper corrective actions are taken by the contractor;

2.6.2.4. Assure all Notice(s) of Violations from regulators and reportable spills are properly reported to regulators and VA;

2.6.2.5. Conduct or direct investigation of all reportable spills and Notice(s) of Violations and verify corrective actions taken;

2.6.2.6. Assign or have on call basis experts in support of environmental and safety related responsibilities for this project;

2.6.2.7. Inform environmental issues and status of corrective actions taken or planned to Project Executive, Project Manager, ERO Environmental Engineer and Tampa VAMC GEMS Coordinator;

2.6.2.8. Inform the CFM's Project Manager of non-compliance issues so that the Contracting Officer and Project Manager can assess the need to withhold payment or issue a stop-work order;

2.6.3. RE will:

2.6.3.1. Serve as action officer and site coordinator for project;

2.6.3.2. Coordinate, communicate, and resolve or elevate known environmental issues or concerns;

2.6.3.3. Prepare field reports daily;

2.6.3.4. Facilitate site access and work of the Contractors;

2.6.3.5. Monitor and enforce terms and conditions of the construction contract;

2.6.3.6. Seek assistance of COE SMEs and consultants as required;

2.6.3.7. Require the Contractor to submit information on their activities: (1) use or generation of hazardous substances and wastes; (2) activities that can potentially violate the provisions of existing permits; (3) activities that have the potential to detrimentally effect the environment;

2.6.3.8. Maintain record keeping as required by Federal, state and local environmental requirements;

2.6.3.9. Keep hard copies and electronic copies onsite for the VA's Construction Environmental Management Plan (CEMP), the contractor's environmental

protection plan (EPP), the Supplementary Environmental Assessment (SEA), Environmental Assessment, and Finding of No Significant Action (FONSI) for SEA and EA;

2.6.3.10. Obtain required concurrence/approval of the Contractor's Environmental Protection Plan, Health and Safety Plan, permit applications and other contractor generated documents;

2.6.3.11. Coordinate resolution of environmental issues;

2.6.3.12. Coordinate with the Contracting Officer to issue Notice(s) of Deficiencies due to non-compliance with this CEMP and the Contractor's Environmental Protection Plan (EPP);

2.6.3.13. Maintain ongoing and effective verbal and written communication with the Contractor on environmental matters;

2.6.3.14. Coordinate with the contractor on issues related with environmental permits and correspondences to regulators.

2.6.3.15. Coordinate actions required to notify the Contractor of withheld payments and/or stop-work orders for non-compliance with the terms and conditions of contract and environmental requirements;

2.7. Construction Contractor will:

2.7.1. Designate a competent environmental person to serve as an action officer and point of contact for environmental issues. This Environmental Officer must have proper qualifications, experience and training in the environmental program management;

2.7.2. Provide the Contractor's Environmental Protection Plan (EPP) and obtain written approval of waivers from VA prior to starting work;

2.7.3. Implement this CEMP and the Contractor's EPP. This includes, but is not limited to, the protection of historic resources, cultural resources, air, and water quality, implementation of effective noise, vibration, and traffic controls, and proper management of soils, hazardous materials, and waste.

2.7.4. Perform work in accordance with the contract specifications, plans and procedures, permit conditions, and Project' Environmental Protection Commitments (EPCs). Specifically, this includes being fully cognizant of and sensitive to the commitments, procedures, restrictions, permit conditions, and guidance identified in the contract. Sub-Contractors will also be required to cooperate fully in implementing any project specifications, procedures, and guidelines developed for environmental compliance.

2.7.5. Be responsible for familiarity with all environmental permits, plans, and procedures, as stated in the contract;

2.7.6. The contractor is responsible for contacting regulators, researching and identifying all requirements of applicable regulators.

2.7.7. Burden of proof of environmental compliance is on the Contractor. The Contractor is responsible for achieving and maintaining compliance with all applicable Federal, state, local requirements. Feedback or lack of feedback from RE and/or or issue or lack of issue of Notice(s) of Deficiencies from RE or CO will not exempt the Contractor from civil and/or criminal penalties that may be imposed by regulators. When the Contractor fails to achieve and maintain environmental compliance with Federal, state and local and Tampa VAMC's environmental requirements, the Contractor will potentially be subject to withheld payments or stop-work orders.

2.7.8. Maintain proper recordkeeping;

2.7.9. Coordinate with Resident Engineer on field activities as required;

2.7.10. Integrate day-to-day construction activities and project-wide environmental compliance;

2.7.11. Be ready for emergencies and spills;

2.7.12. Direct response to all levels of spills providing prompt spill response and reporting of spills and emergencies;

2.7.13. Provide signage and way finding that will inform the public of temporarily closed areas and alternate routes;

2.7.14. Evaluate site-specific mitigation measures in advance and tailor mitigation measures prior to initiating construction activities;

2.7.15. Incorporate environmental issues into daily planning and monitor progress daily;

2.7.16. Communicate in a timely manner environmental issues to RE;

2.7.17. Initiate timely corrective actions to protect communities and environmental resources;

2.7.18. Follow protocols outlined in the contract to ensure that the necessary engineering and scientific methods, practices, procedures and resources shall be employed throughout the design and construction and that these conform to the applicable requirements of the National Historic Preservation Act, the Florida State Historic Preservation Officers, and the native Indian tribes.

2.7.19. Upon discovery of an environmental non-compliance, either by contractor's self-discovery or notification from RE, the Contractor shall take prompt corrective actions.

2.7.20. Work with RE to identify site-specific mitigation needs and construction sequencing to limit impacts on public, patients and hospital operations and ensure environmental compliance;

2.7.21. Develop and conduct Environmental Awareness Training and other applicable training requirements for all contractor and sub-contractor personnel during the contract phase;

2.7.22. Prepare field reports daily and direct sub-contractors to include environmental compliance into their activities and performance;

2.7.23. Facilitate site access and work of VA or its contractors for any work that may be required on the Project site;

2.7.24. Support Tampa VAMC on regulatory matters that include, but are not limited to, environmental permits and site inspections by regulatory agencies;

2.7.25. Track and identify hazardous waste issues on the work site. Ensure that all hazardous materials present on the site have been cited in a Safety Data Sheet (SDS) and that employees are aware of the hazards present in the workplace and have access to SDS logs;

2.7.26. Ensure review and coordination prior to sending transmittals for environmental reports and documents;

2.7.27. Submit information on its activities that involve the use or generation of hazardous substances and wastes, or that can potentially violate the provisions of existing permits, or that have the potential to detrimentally effect the environment; and

2.7.28. Inform sub-contractor(s) that when they acquire, handle, transport and/or store regulated substances (e.g., hazardous wastes), which trigger worker health or safety and/or environmental concerns, such substances must be treated in a safe, appropriate manner as defined by the applicable laws and regulations and project-specific plans/procedures.

PART 3 - ENVIRONMENTAL MANAGEMENT CONTROLS

3. ENVIRONMENTAL MANAGEMENT CONTROLS

3.1. The process of environmental compliance begins prior to construction by identifying, tracking, and integrating environmental requirements during design. It also includes effective permitting and construction planning to incorporate environmental controls and mitigation measures accepted or approved by the responsible agencies during the design phase.

3.2. Construction Environmental Management Plan: The environmental management objectives will be accomplished by implementing this CEMP. This CEMP is a living document that will be updated as contracts are refined, design evolves, and additional information becomes available. This CEMP has the following features:

- Defines responsibilities and actions required to maintain compliance with environmental requirements during construction and to effectively respond to problem situations or agency/public concerns;
- Establishes necessary procedures for communications, documentation and review of environmental compliance activities for each construction contract;
- Describes the Historic Properties adjacent to the Project and kinds of mitigation measures needed to protect them; and
- Identifies prior environmental protection commitments made for the Project.

3.3. Contractor's Environmental Protection Plan (EPP): Construction Specification, Section 01 57 19 (temporary environmental Control), para 1.4 A, requires the construction Contractor to prepare and implement a Construction Contractor's Environmental Protection Plan (EPP). Prior to commencing construction activities or delivery of materials to the site, the contractor shall submit EPP for review and approval by the Contracting Officer.

3.3.1. The purpose of the EPP is include specific environmental requirements that are required by the state and local laws and regulations. The EPP will present a comprehensive overview of known or potential environmental issues which the Contractor must address during construction. Issues of concern must be defined within the EPP.

3.3.2. EPP must not repeat CEMP but endorse and supplement environmental protection measures provided in paragraph 5 of this CEMP.

3.3.3. EPP will include additional Best Management Practices and topics or issues which are not identified in this CEMP, but are considered necessary.

3.3.4. EPP will discuss topics at a level of detail commensurate with the environmental issue and required construction task(s).

3.3.5. **The EPP must be project-specific, current, approved by the Contracting Officer, and maintained onsite by the Contractor.**

3.4. Compliance

3.4.1. The contractor shall comply with all applicable Federal, state, and local environmental laws and regulations.

3.4.2. The contractor shall comply with this CEMP. If there is a conflict between this CEMP and Federal, state and local requirements, the contractor must comply with the Federal, state and local regulations. If there is a conflict between this CEMP and VA's construction specifications, the Contractor must comply with this CEMP.

3.4.3. The contractor shall minimize environmental pollution and damage during the construction phase. The environmental resources within the project boundaries and those affected outside the limits of permanent work must be protected during the entire duration of the construction phase.

3.4.4. The contractor shall take immediate and appropriate corrective actions to achieve and maintain compliance. The Contractor shall be responsible for the cost of corrective actions when deficiencies are caused by the contractor. The Contractor is liable for any additional cost to the government that is attributed to the noncompliance due to faults of the Contractor and/or Subcontractors. Such situations include, but are not limited to:

- Failure to comply with Federal, state, local and VA requirements;
- Failure to comply with this VA's Construction Environmental Management Plan; and
- Failure to comply with the Contractor's Environmental Protection Plan.
- Project delays resulting from the contractor's failure to comply with Federal, state, local environmental laws and regulations.

3.5. Sub-Contractor(s): The contractor shall ensure sub-contractors comply with this CEMP. The contractor is responsible for environmental actions of subcontractor(s).

3.6. Payment: No separate payment will be made for work covered under this CEMP. Payment of fees associated with environmental permits, application, and/or notices obtained by the Contractor, and payment of all fines/fees for violation or non-compliance with Federal, state, Regional and local laws and regulations are the Contractors responsibility. All costs associated with this CEMP must be included in the contract price.

3.7. SAFETY and OCCUPATIONAL HEALTH

3.7.1. The contractor shall be responsible for protecting the lives and health of employees and other persons, preventing damage to property, materials, supplies and equipment, avoiding work interruptions and complying with the Occupational Safety and Health Administration (OSHA) safety and health regulations and VA's safety requirements.

3.7.2. All onsite workers (contractor and subcontractor(s)) performing hazardous operations including working with hazardous materials, must have completed the applicable training, plus refresher training course. The contractor shall maintain documentation supporting training records and have a written Health and Safety Plan on-site available for review by workers, VA and regulators.

3.7.3. The Contractor will be responsible to submit a Health and Safety Plan (HASP) to VA for review and approval. The HASP will be approved prior to the start of construction activities.

3.8. COMPLIANCE TRACKING AND REPORTS

3.8.1. The design and construction contractors shall assure compliance tracking, reporting, environmental restrictions and measures to mitigate adverse effects to the environment when these are identified and described in FONSI and SEA. The design and construction contractors shall track incorporation of these commitments into construction planning and field implementation. Although this CEMP summarizes these requirements, the design and construction contractors are responsible for reviewing FONSI and SEA.

3.8.2. Although VAMC is exempt from acquiring local permits, the Project's construction will be coordinated with the city agencies and will comply with local requirements as necessary.

3.9. MASTER SPECIFICATION AND CONSTRUCTION PLANNING

3.9.1. The construction contractor shall comply with Master Specification, available at a FTP site at: http://downloads.va.gov/files/CFM-TIL/spec/currentSpecs/ . Specifically, the following Technical Information Library (TIL) Master Specifications must be included in the contract:

- 01 57 19 – Temporary Environmental Controls
- 01 74 19 – Construction Waste Management
- 01 81 13 – Sustainable Construction Requirements
- 02 41 00 – Demolition
- 02 65 00 – Underground Storage Tank Removal
- 02 82 11 – Traditional Asbestos Abatement

- 02 82 13 13 – Glovebag Asbestos Abatement
- 02 82 13 19 – Asbestos Floor Tile and Mastic Abatement
- 02 82 13 21 – Asbestos Roofing Abatement
- 02 82 13 31 – Asbestos Transite Abatement
- 02 82 13 41 – Asbestos Abatement for Total Demolition Project
- 02 83 33 13 – Lead Containing Building Component Removal and Disposal
- 22 11 00 – Facility Water Distribution
- 22 11 23 – Domestic Water Pumps
- 22 12 16 – Facility Elevated, Portable-Water Storage Tanks
- 22 13 00 – Facility Sanitary and Vent Piping
- 22 13 23 – Sanitary Waste Interceptors
- 22 13 29 – Sanitary Sewerage Pumps
- 22 14 00 – Facility Storm Drainage
- 22 31 11 – Water Softeners
- 22 34 00 – Fuel-Fired Domestic Water Heaters
- 22 67 19 16 – Reverse Osmosis Water Equipment
- 22 67 21 – Water Dealkalization System
- 23 05 41 – Noise and Vibration Control for HVAC Piping and Equipment
- 23 05 51 – Noise and Vibration Control for Boiler Plant
- 23 09 23 – Direct-Digital Control System for HVAC
- 23 22 13 – Steam and Condensate Heating Piping
- 23 22 23 – Steam Condensate Pumps
- 23 56 00 – Solar Energy Heating System
- 23 64 00 – Package Water Chillers
- 23 65 00 – Cooling Towers
- 31 20 00 – Earth Moving
- 31 23 19 - Dewatering
- 33 10 00 – Water Utilities
- 33 30 00 – Sanitary Sewerage Utilities

- 33 40 00 - Storm Sewer Utilities
- 33 51 00 – Natural Gas Distribution

3.9.2. Environmental requirements will be incorporated into design and construction specifications and planning. Design and construction personnel and the Contractor must become familiar with the commitments and requirements of the project and for the locations where they are working. They will incorporate and tailor mitigation measures to particular work site locations as required and appropriate.

3.9.3. As part of construction planning, numerous and detailed construction work plans will be sequentially prepared that cover specific portions of the Project. These plans will identify key construction activities, staging sequence, schedules, and work locations within specific work sites.

3.9.4. Construction planning compliance with environmental requirements and mitigation measures will be assessed by VA prior to the commitment of any major construction activity or work at any new construction site. The Contractor will confirm awareness of these environmental requirements before starting related work.

3.10. SPECIFIC REQUIREMENTS OF VAMC FOR THE CONTRACTOR

3.10.1. The contractor is responsible for environmental compliance for the project during the construction phase.

3.10.2. The contractor will not burden the VAMC personnel with the project related workload other than for obtaining signatures or approval from VAMC.

3.10.3. The contractor shall keep the GEMS Coordinator informed of status of key environmental issues.

3.10.4. The contractor shall provide construction debris recycling data to the RE and VAMC.

3.10.5. The contractor is responsible for obtaining all permits as required. These include modification of existing permits as well as obtaining new permits as required. Also, the contractor is responsible for coordination of the closure of permits or the transfer to operation phase.

3.10.6. The contractor shall not leave chemicals on-site. The VAMC is not responsible for disposal of chemicals left.

3.10.7. The contractor must dispose of waste on a periodic basis and in accordance with the RCRA. The contractor shall not store a large amount of hazardous waste for disposal that would trigger a change in VAMC hazardous waste generator status.

3.11. ENVIRONMENTAL QUALITY ASSURANCE INSPECTIONS

3.11.1. The RE will be responsible for conducting daily field inspections of construction activities in a quality assurance (QA) role. As part of that inspection, they will confirm that work areas remain in compliance with all applicable permit conditions, project commitments, contract specifications, and contractual obligations in accordance with the Finding of No Significant Impact (FONSI), Memorandum of Agreement (MOA), and applicable Federal, state and local laws and regulations. The RE will have the authority to stop work if environmental non-compliance is observed and the Contractor does not correct the deficiency. A daily Field Logbook will be used by the RE (or designated inspector(s)) to document observations, including those related to environmental compliance.

3.11.2. The RE (or designated inspector(s)) will give verbal direction on-site to the applicable contractor to initiate corrective actions when problems are observed. Copies of all daily Field Logbooks will be available for review in the RE's office. In circumstances where repeated or serious problems are observed, the RE (or designated inspector(s)) will prepare a Deficiency Report for transmittal by the Contracting Officer to the offending Contractor. Corrective actions and the applicable permit or contract condition will be cited in the Deficiency Reports. Upon initiation of corrective action the RE will inspect the site and sign a copy of the Deficiency Report, confirming that compliance has been achieved.

3.11.3. The RE will review anticipated work with the Contractors as part of the inspection process, so that the need for mitigation measures can be effectively recognized, planned, and implemented in advance.

3.12. THE COMMUNITY OUTREACH

3.12.1. Tampa VAMC Chief, Communications, and Media Service will be Office of Primary Responsibility (OPR) and authorized person for the community outreach for this Project. All contractors, subcontractors, and personnel working on this Project shall avoid direct contact with media and they will refer all community outreach issues to the VA's authorized person for the community outreach.

3.12.2. The objective of the community outreach program is to encourage an exchange of ideas and information on issues related to the Project and to generate interest in and support for the Project. The goals of the program are to:

- Educate the public about the Project in general;
- Provide a forum for gathering information, identifying and resolving public issues and concerns as they arise; and
- Address public complaints in a timely manner
- Promote ongoing communication with public.

3.12.3. The outreach effort may include any or all of the following methods for maintaining ongoing communication with the public:

- Website and Newsletters;
- Information Bulletins;
- E-mail notifications; and/or
- Meeting with appropriate stakeholders

PART 4 – PROTECTION OF ENVIRONMENTAL RESOURCES

4. ENVIRONMENTAL PROTECTION COMMITMENT

This CEMP incorporates environmental protection commitments (EPCs) made in the Finding of No Significant Impact (FONSI), signed on September 14, 2015, and Supplementary Environmental Assessment (SEA), July 2015. FONSI and SEA are both incorporated by reference in this CEMP and the Contractor and COE are required to review these documents and assure their compliance during the construction phase of the Project. This project did not require Memorandum of Agreement pursuant to Section 106 of the National Historic Preservation Act of 1966.Commitments made in the SEA are summarized in Table 1 below.

Table 1: Environmental Protection Measures/Best Management Practices for the Proposed Action (See Table 17 of SEA)

Technical Resource Area	Environmental Protection Measures/Best Management Practices
Aesthetics	As applicable, comply with the Hillsborough County Tree Ordinance as applied to trees and vegetation removed during demolition and construction and operation.
	Create and routinely maintain landscaped areas, buildings, roadways, and signage.
	Implement the construction-related BMPs for dust control described for Air Quality.
Land Use and Zoning	Conform to extent practicable with the Hillsborough County Comprehensive Plan.
Air Quality	Apply for a permit exemption for the backup generator under JAHVH's existing air permit, issued by the Hillsborough County Environmental Protection Commission.
	Use appropriate dust suppression methods during on-site construction activities. Available methods include application of water, dust palliative, or soil stabilizers; use of enclosures, covers, silt fences, or wheel washers; and suspension of earth-moving activities during high wind conditions. Conform to the VA MF04 specifications.
	Maintain an appropriate speed to minimize dust

Technical Resource Area	Environmental Protection Measures/Best Management Practices
	generated by vehicles and equipment on unpaved surfaces.
	Cover haul trucks with tarps.
	Stabilize previously disturbed areas through re-vegetation or mulching if the construction area would be inactive for several weeks or longer.
	Visually monitor all construction activities regularly, particularly during extended periods of dry weather, and implement dust control measures when appropriate.
Cultural Resources	Properly address any unknown cultural resources discoveries during site development. To accomplish this, VA will contact the Florida SHPO and selected Native American Tribes if any unknown cultural resources are discovered during site development.
	Comply with the NHPA, ARPA, NAGPRA, AIRFA, 36 CFR Part 79, and EO 13007 during the proposed site development.
Topography, Geology, and Soils	Design paved areas to drain to the existing stormwater management system.
	Sinkholes encountered during construction activities, if any, would be inspected by an experienced geotechnical engineer, who would recommend stabilization measures to prevent erosion into any such feature. During operations, JAHVH staff to visually inspect ground for evidence of subsidence or sinkhole activity.
	During construction install and monitor erosion-prevention measures, such as silt fences and water breaks, detention basins, filter fences, sediment berms, interceptor ditches, straw bales, rip-rap, and/or other sediment control structures; respreads stockpiled topsoil; and seed/re-vegetate areas temporarily cleared of vegetation. Conform to the VA MF04 specifications.

Technical Resource Area	Environmental Protection Measures/Best Management Practices
	Retain on-site vegetation to the maximum extent possible.
	Plant and maintain soil stabilizing vegetation on disturbed areas.
	Use native vegetation to re-vegetate disturbed soils.
	The construction contractor would obtain all required FDEP permits before any proposed construction activities commence, and would adhere to permit conditions during all on-site construction activities. These include BMPs under a General Construction Permit.
Hydrology and Water Resources	Inspect and maintain construction vehicles in good working order, and maintain a spill kit during construction, to avoid accidental releases of petroleum-based fluids from contaminating groundwater.
	Complete a storm water concurrency as part of the design and construction activities.
	Implement Storm Water Management Facilities (SWMFs) and other related storm water management infrastructure for the site.
	Address the potential for sinkhole formation and the potential for direct discharge to the aquifer (i.e., groundwater table).
	Prior to construction, submit a Notice of Intent (NOI) application and a General Construction Permit application (for disturbing more than one acre of land) application including a Storm Water Pollution Prevention Plan (SWPPP) for all storm water discharge actions to FDEP for approval.
	Develop a site design that prevents surface water runoff from reaching the adjacent storm water drainage ditch.
	Develop a site design that accounts for pre/post 100-year volume storm water drainage, and implement pre/post

Technical Resource Area	Environmental Protection Measures/Best Management Practices
	100-year volume storm water retention.
Wildlife and Habitat	Native species would be used to the extent practicable when re-vegetating land disturbed by construction, to avoid the potential introduction of non-native or invasive species.
Floodplains, Wetlands, and Coastal Zone Management	Develop a site design that avoids 100-year and 500-year floodplains to the maximum extent possible. For the Satellite CUP, prepare and implement flood action plan to minimize potential impacts from a 100-year flood event.
	Coordinate with the FDEP – Coastal Management Program (CMP) to ensure that the Proposed Action remains consistent with the CMP's Coastal Zone Management Program.
	Develop a site design that avoids additional fill or provides compensatory storage for unavoidable fill within the 100-year floodplain.
Solid and Hazardous Materials	Comply with existing VA SOPs and applicable Federal and State laws governing the use, generation, storage, or transportation of solid or hazardous materials.
	Avoid or limit the use of hazardous materials, including building material products, during construction and operation of the proposed New South Bed Tower and Infrastructure Improvements. If hazardous materials are required during construction and/or operation, store in locations designated for hazardous materials (e.g. locked and labeled metal cabinets).
	If hazardous substances are release to the Site during construction or operation, these applicable Federal and State requirements must be followed in response and cleanup.
	Comply with existing VA SOPs and applicable federal and state laws governing the use, generation, storage, or transportation of solid or hazardous materials.

Technical Resource Area	Environmental Protection Measures/Best Management Practices
Traffic, Transportation and Parking	Coordinate with the Florida Department of Transportation (FDOT) to ensure that construction and operational traffic are considered in the planning of future transportation improvements in this vicinity.
	Work with FDOT to identify and implement roadway improvements, as necessary, such as turn lanes and signals.
	Ensure debris and/or soil is not deposited on local roadways during the construction period.
	Ensure construction activities do not adversely affect traffic flow on local roadways; construction would be timed to avoid peak travel hours.
Noise	Coordinate proposed construction activities in advance with adjacent sensitive receptors (residents). Let the local residents know construction times, including when operations would start and finish each day. Post signage, updated daily, at the entry points of the site, with the current construction information, including schedule and activity.
	Limit, to the extent possible, construction and associated heavy truck traffic to occur between 7:30 AM and 6:00 PM during normal, weekday work hours. This measure would reduce noise effects during sensitive nighttime hours.
	Select material transportation routes as far away from sensitive receptors as possible.
	Maintain noisy equipment per manufacturer's recommendations.
	Per VA requirement, monitor noise levels at least once every 5 days during high-noise generating construction activities.
	Encourage construction personnel to operate equipment in the quietest manner practicable (e.g., retarder brake

Technical Resource Area	Environmental Protection Measures/Best Management Practices
	restrictions, engine speed restrictions, etc.).
	Observe Hillsborough County noise ordinance at all times.
	Locate stationary operating equipment as far away from surrounding residents as possible. Shut down heavy equipment and other noise emitters when it is not in use.

5. ENVIRONMENTAL PROTECTION MEASURES

The Construction Contractor shall employ the following Best Management Practices (BMPs) during the construction phase of this Project at Tampa VAMC.

5.1. AESTHETICS

5.1.1. As applicable, comply with the Hillsborough County Tree Ordinance as applied to trees and vegetation removed during demolition and construction and operation.

5.1.2. Create and routinely maintain landscaped areas, buildings, roadways, and signage.

5.1.3. Implement the construction-related BMPs for dust control described for Air Quality.

5.2. LAND USE AND ZONING

5.2.1. Conform to extent practicable with the Hillsborough County Comprehensive Plan

5.3. AIR QUALITY

5.3.1. The Contractor shall keep construction activities under surveillance, management, and control to minimize pollution of air resources. All activities, equipment, processes, and work operated or performed by the Contractor in accomplishing the specified construction shall be in strict accordance with Federal, state and local emission and performance laws and standards. Ambient Air Quality Standards set by the EPA, state and local regulatory agencies shall be maintained for all construction operations and activities. The Contractor shall have sufficient functional equipment available to accomplish this task.

5.3.2. Open Burning: The burning of man-made debris and vegetation is prohibited on Tampa VAMC.

5.3.3. Painting: The Contractor may perform small, maintenance-type painting (brushes, spray cans). Large scale and routine painting in a booth, with spray guns, ventilation, filters, etc., must be approved by Tampa VAMC.

5.3.4. Odors: Odors shall be controlled at all times from all construction activities, processing, and preparation of materials.

5.3.5. Ozone Depleting Substances: Any work to be performed on Freon containing equipment (either new or existing equipment) shall be performed by EPA certified technicians using certified equipment. All excess Class I ozone depleting substances and R-22 type Freon being removed from equipment associated with chiller retrofits shall remain the property of VA. Call Tampa VAMC GEMS Coordinator for assistance. Any Freon removed or added must be reported to Tampa VAMC GEMS Coordinator for compliance with EPA Title VI.

5.3.6. Air Permits:

- Air permits must be obtained prior to the start of construction through Tampa VAMC GEMS Coordinator.
- Any construction project which involves the construction or modification of parking facilities which may result in an ambient air quality standard for carbon monoxide being exceeded must be coordinated through Tampa VAMC GEMS Coordinator.
- Apply for a permit exemption for the backup generator JAHVH existing air permit issued by the Hillsborough County Environmental Protection Commission.

5.3.7. Particulates:

- Dust particles, aerosols, and gaseous by-products and fumes from all construction activities and the processing and preparing of materials, such as from asphalt batch plants and abrasive blasting shall be controlled at all times at the construction site.
- Use appropriate dust suppression methods during on-site construction activities. Available methods include application of water, dust palliative, or soil stabilizers; use of enclosures, covers, silt fences, or wheel washers; and suspension of earth-moving activities during high wind conditions. Conform to the VA MF04 specifications. VA MF04 is VA's Master Construction Specifications (Master Format 2004; MF04) for construction standards for temporary environmental controls, demolition, and waste management; application of standard construction BMPs. See http://www.cfm.va.gov/til/spec.asp
- Maintain an appropriate speed to minimize dust generated by vehicles and equipment on unpaved surfaces.

- Cover haul trucks with tarps.
- Stabilize previously disturbed areas through re-vegetation or mulching if the construction area would be inactive for several weeks or longer.
- Visually monitor all construction activities regularly, particularly during extended periods of dry weather, and implement dust control measures when appropriate.
- Use perimeter site screens.
- Hose down demolition activities.
- Remove precast elements to offsite to allow crushing at an offsite facility.
- Regular cleaning of approach roadways without creating dust.
- Hose down vehicles access routes and construction vehicles leaving construction sites.

5.4. CULTURAL RESOURCES

5.4.1. The contractor will ensure that an archeologist is on call and utilized on an as-needed basis while all ground disturbing activities associated with the project are taking place. Any needed archaeological surface and subsurface investigations, site testing, construction, or other project activities that involve surface or subsurface disturbance will require the participation of an archaeologist that meets the Secretary of the Interior's standard for a professional archaeologist as defined in 36 CFR 61 Appendix A (qualified archaeologist).

5.4.2. Thresholds and protocols for Cultural Resource Site Identification and Data Recovery during Archaeological Monitoring of Construction activities: The following shall be a guideline for recognizing qualitative and quantitative characteristics that indicates the presence of significant historic artifacts during the monitoring of construction activities within the Project site. The following is not an exhaustive list and discretion is given to an archaeological monitor to include additional characteristics for additional, intensive investigations.

- Whenever an archaeological monitor observes the exposure of potential cultural material or features, the monitor will be permitted to access the location to allow for close visual examination. The monitor may undertake trowel and/or shovel excavation not to exceed 50 cm^3 in any single exposure to determine horizontal and/or vertical extents of the deposit, integrity, presence of diagnostic artifacts, and potential for providing significant information regarding the history or prehistory of the region and

Campus. The provenience of isolated diagnostic artifacts will be piece plotted on project mapping, recorded on standard forms, and collected for analysis.

- Construction will be halted by the archaeological monitor if any of the following cultural resources are encountered:
  - Intact historic building foundation elements (brick or stone piers, linear alignments, soil anomalies.)
  - Construction Shaft features (privies, wells),
  - Cumulative artifact concentration in excess of 25% visible within the matrix of an exposed square meter.
- The estimation of the percentage of artifacts will make adjustments for architectural artifacts (bricks, mortar, and window glass) that have been broken and smeared across an exposure. In consultation with SHPO, the definition of cumulative artifacts concentration will be iteratively reassessed through the duration of project construction. If the initial investigation identifies the deposit as potentially significant and likely to yield information important to history, then work shall cease at the location of the find and a buffer of a 50 foot radius will be constructed with flagging tape and stakes/cones. A brief description of the find will be prepared on standard forms that include location, estimated areal extent, inventory of visible artifacts, and preliminary interpretation. Recordation will include at least 2 photos with north arrow, scale, and sign board with temporary number clearly visible. A plan view map will be prepared and the site location will be recorded by GPS. Each find proposed for Phase II investigation will be communicated immediately (within two hours) to the SHPO, RE, VA Project Manager, ERO Environmental Engineer and VA Historic Preservation Officer.

5.4.3. The contractor shall Comply with the NHPA, ARPA, NAGPRA, AIRFA, 36 CFR Part 79, and EO 13007 during the site development. Properly address any unknown cultural resources discoveries during site development. To accomplish this, VA Historic Preservation Officer will also contact the Florida SHPO and selected Native American Tribes if any unknown cultural resources are discovered during site development.

5.4.4. There are no known historic structures on Tampa VAMC campus or in the immediately surrounding areas; nearly all of the standing structures were constructed between the 1960s and the 1990s.However, if intact features are found, in order to minimize delay within the construction phase of the Project, it is imperative that unanticipated discoveries be documented, recorded, and data recovered in an expedited manner. It is also critical that SHPO be provided an opportunity to participate in the consultation

process regarding the evaluation and ultimately the mitigation of resources that are found.

5.5. TOPOGRAPHY, GEOLOGY AND SOILS

5.5.1. Design paved areas to drain to the existing stormwater management system.

5.5.2. Sinkholes encountered during construction activities, if any, would be inspected by an experienced geotechnical engineer, who would recommend stabilization measures to prevent erosion into any such feature.

5.5.3. Install and monitor erosion prevention measures, such as silt fences and water breaks, detention basins, filter fences, sediment berms, interceptor ditches, straw bales, rip-rap, and/or other sediment control structures; respreads stockpiled topsoil; and seed/re-vegetate areas temporarily cleared of vegetation. Conform to the VA MF04 specifications.

5.5.4. Retain on-Site vegetation to the maximum extent possible.

5.5.5. Use native vegetation to re-vegetate disturbed soils.

5.5.6. Plant and maintain soil stabilizing vegetation on disturbed areas.

5.5.7. The construction contractor would obtain all required permits before any proposed construction activities commence, and would adhere to permit conditions during all on-site construction activities.

5.6. HYDROLOGY AND WATER RESOURCES

5.6.1. Inspect and maintain construction vehicles in good working order, and maintain a spill kit during construction, to avoid accidental releases of petroleum-based fluids from contaminating groundwater.

5.6.2. Address the potential for sinkhole formation and the potential for direct discharge to the aquifer (i.e., groundwater table).

5.6.3. Waste water from construction activities will be collected and reused where possible or treated prior to disposal.

5.6.4. Develop a site design that accounts for pre/post 100-year volume stormwater drainage, and implement pre/post 100-year volume stormwater retention.

5.6.5. <u>Soil Erosion And Sediment Control</u>

- Prepare and implement a Stormwater Pollution Prevention Plan (SWPPP).
- If required, develop a site design that prevents surface water runoff from reaching the adjacent stormwater drainage ditch.

- Install erosion control facilities to protect the area of work for each stage of construction. When work for each stage is finished or as work progresses, the contractor shall remove, modify, or install new erosion control facilities as required by job conditions.
- Periodically check the erosion control facilities after each significant precipitation event and clean the debris or sediment, repair or replace each of these facilities as required.
- Regularly check that stormwater runoff measures are still in place and serviceable.
- Perform redirection or catching of offsite stormwater prior to entering site
- If required, implement Stormwater Management Facilities (SWMFs) and other related stormwater management infrastructure for the Site.
- Provide an erosion control barrier such as a silt fence and/or hay bales along the perimeter of the work areas. Silt fence and/or hay bales shall be installed, maintained and modified as project conditions warrant. If required, use silt socks and filters fabric in stormwater runoff areas, pits and gutters.
- Undertake all necessary precautions to prevent contamination of the site and adjacent areas from materials such as silt, sediment, fuel, solvents, concrete, etc., or any other kind of pollutant.
- Remove any self-generated excess debris from the construction site in a timely manner. Excess debris shall be permanently removed or temporarily stored in an approved manner. Temporary stockpiles of soil and erodible materials used by the contractor shall be properly protected.
- Provide and maintain a stabilized entrance driveway of stone at all points where traffic will be entering or leaving the construction site.
- Provide and maintain drain inlet protection at all existing inlets and catch basins.
- If required, provide and maintain a truck wash station.
- Prepare and submit a monthly photographic report documenting soil erosion control measures in place as part of "Monthly Progress Report."
- If required, use onsite sediment basin and treatment prior to pump out.

5.7. WILDLIFE AND HABITAT

5.7.1. Native species would be used to the extent practicable when re-vegetating land disturbed by construction, to avoid the potential introduction of non-native or invasive species.

5.8. FLOODPLAINS, WETLANDS, AND COASTAL ZONE

5.8.1. Develop a site design that avoids 100-year and 500-year floodplains to the maximum extent possible. For the Satellite CUP, prepare and implement flood action plan to minimize potential impacts from a 100-year flood event.

5.8.2. Coordinate with the FDEP – Coastal Management Program (CMP) to ensure that the Proposed Action is consistent with the CMP's.

5.8.3. Develop a site design that avoids additional fill or provides compensatory storage for unavoidable fill within the 100-year floodplain.

5.9. SOLID AND HAZARDOUS MATERIALS

5.9.1. Hazardous Waste/Materials

- No work will commence until the Contractor has assessed hazardous materials and dangerous goods and the contractor has developed and put in place a VA approved hazardous waste assessment and disposal plan.
- The Contractor is responsible for the proper use, storage, and disposal of petroleum products, hazardous materials (HM), and hazardous waste (HW) according to all Federal, state , and local regulations (including, but not limited to, 49 CFR, 40 CFR, OSHA 1910.120). Petroleum products, hazardous materials, Contractor-generated hazardous wastes shall be managed, stored, and dispensed ensuring no spillage to the ground or water. Liquid hazardous materials and hazardous waste require secondary containment (40 CFR 112) that is capable of holding 110% of the volume of the largest container, or 10% of the total volume for the consolidated location, whichever is greater.
- The Contractor must provide for the proper storage of HM and HW and to take all the necessary provisions to meet the National Fire Protection Association (NFPA) codes, the Occupational Safety and Health Act (OSHA) and the Resource Conservation and Recovery Act (RCRA) laws and regulations.
- The Contractor is responsible for determining whether a contractor-generated waste is hazardous. In order to determine whether a waste is classified as a hazardous waste, the Contractor must use a specific EPA testing procedure called the Toxicity Characteristics Leaching Process, and must dispose of IAW all Federal, state, and local regulations.

- The Contractor is responsible for using a licensed hazardous waste hauler to transport of Contractor-generated HW off Government property to a permitted transportation, storage, and disposal facility (TSDF). The Contractor shall coordinate with RE and Tampa VAMC GEMS Coordinator to obtain EPA ID number for the standard manifest. Hazardous waste must not leave the VAMC without a designated representative from Tampa VAMC GEMS Coordinator signing and obtaining a copy of manifest.
- The Contractor shall ensure that all of contractor employees who handle hazardous wastes are trained in the management requirements for hazardous waste,
- The Contractor's Environmental Protection Plan (EPP) shall contain a list of hazardous materials to be used on the project and their Safety Data Sheet (SDSs). The EPP will also explain how, the Contractor, will address spills of oil or HM.
- Avoid or limit use of hazardous materials, including building material products, during construction and operation of the proposed New South Bed Tower and Infrastructure Improvements. If hazardous materials are required during construction and/or operation, store in locations designated for hazardous materials (e.g. locked and labeled metal cabinets).

5.9.2. Solid Waste

- The Contractor is responsible for determining whether a contractor-generated waste, solid waste included, is hazardous. Solid waste resulting solely from construction, remodeling, repair, or demolition operations on pavement, buildings, or other structures on Tampa VAMC may be disposed in City approved Construction and Demolition (C&D) landfill(s).Some examples of acceptable solid waste are plywood, fixtures, electrical materials, doors, painted wood, non-recyclable concrete, windows, drywall shingles, vinyl siding, plumbing materials and treated wood.
- The Contractor shall implement a recycling program (with an emphasis on recycling at the construction site) that includes separate collection of waste and recyclable materials. Based upon contract plans and drawings, the Contractor shall estimate the quantities of available materials for recycling. Contractors are encouraged to segregate recyclable materials at the point of generation. See TIL Master Specification 01 74 19.
- Prime Contractors are responsible for ensuring that all subcontractors are properly trained regarding segregation, storage, transport, and disposal of C&D wastes. Any abuse or negligence by a sub-Contractor

will be directed to the Prime Contractor. Prime Contractors may be required to pay the cost of cleanup and proper disposal of prohibited or misplaced items. Contractors are reminded to check with the local regulators regarding prohibited items that cannot be disposed. For example, North Carolina Solid Waste Management Rules and Regulations prohibit the disposal of aluminum cans.

- The following Hazardous and Regulated Waste items are prohibited for disposal at the C&D landfills:

• Battery (other than alkaline)	• Petroleum Products (including fuel)
• Paints	• Solvents
• Fuel Filters	• Oil Filters
• Adhesives	• PCB Ballads
• Fluorescent Lamps	

5.9.3. Provide the following information in the Contractor's EPP:

- Name(s) of individual(s) on the Contractor's staff responsible for waste prevention and management;
- Actions that will be taken to reduce solid waste generation, including coordination with subcontractors to ensure awareness and participation;
- Description of the regular meeting(s) to be held to address waste management;
- Description of the specific approaches to be used in recycling/reuse of the various materials generated, including the areas on site and equipment to be used for processing, storage, and temporary storage of wastes;
- Characterization, including estimated types and quantities, of the wastes to be generated;
- Name(s) of the landfill(s) and/or incinerator to be used and the estimated costs for use, assuming that there would be no salvage or recycling on the project;
- Identification of local and regional reuse program, including non-profit organizations such as schools, local housing agencies, and organizations that accept used materials such as material exchange networks and Habitat for Humanity. Include the name,

location, and phone number for each reuse facility to be used, and provide a copy of the permit or license for each facility.

- List of specific waste materials that will be salvaged for resale, salvaged and reused on the current project, salvaged and stored for reuse on a future project, or recycled. Recycling facilities that will be used shall be identified by name, location, and phone number, including a copy of the permit or license for each facility.
- Identification of materials that cannot be recycled with an explanation or justification, to be approved by the Contracting Officer (CO).
- Description of the means by which any waste materials identified in item (8) above will be protected from contamination.
- Description of the means of transportation of the recyclable materials (whether materials will be site-separated and self-hauled to designated centers or whether mixed materials will be collected by a waste hauler and removed from the site).
- Anticipated net cost savings by recycling/reusing as determined by subtracting Contractor program management cost and cost of disposal from the revenue generated by sale of the materials and the incineration and/or landfill cost avoidance.
- Does the project require disposal of liquid materials? Yes or No.
- Does the project require disposal of soil? Yes or No.
- Estimated waste to be generated (i.e., sludge, liquids, soil, debris in tons). Metric Tons of each type.

5.9.4. Spills

- If hazardous substances are release to the Site during construction or operation, these applicable Federal and State requirements must be followed in response and cleanup.
- Spills of hazardous or toxic materials shall be immediately reported to Hillsborough County Fire Department. Tampa VAMC GEMS Coordinator, the RE, and the COE Environmental Office. The person(s) discovering the emergency will take all steps possible to immediately alert others in the area, shut down all fuel operations (if appropriate), and safely initiate steps to control the emergency and reduce the hazard. The Contractor is responsible for cleanup and disposal and all associated costs due to Contractor generated spills.

5.10. TRAFFIC, TRANSPORTATION AND PARKING

5.10.1. Coordinate with the Florida Department of Transportation (FDOT) to ensure that construction and operational traffic are considered in the planning of future transportation improvements in this vicinity.

5.10.2. Work with FDOT to identify and implement roadway improvements, as necessary, such as turn lanes and signals.

5.10.3. Ensure debris and/or soil is not deposited on local roadways during the construction period.

5.10.4. Ensure construction activities do not adversely affect traffic flow on local roadways; construction would be timed to avoid peak travel hours.

5.10.5. Use the following BMPs for Traffic, Transportation and parking:

- Ensure appropriate traffic control measures are employed to ensure separation of construction activities from public.
- Ensure appropriate directional signage is in place for access pathways and trafficable areas.
- Barriers and hoardings in place to ensure no authorized access to construction zones.
- Ensure site personnel use identified traffic routes to site as shown on the traffic management plan.
- During excavation the use of two way radios will be used to direct traffic to come to site from a designated holding area so that there is no traffic congestion around site from a backlog of construction traffic.

5.11. NOISE

5.11.1. <u>Noise and Vibration Abatement During Construction Activities</u>

- Coordinate proposed construction activities in advance with adjacent sensitive receptors (residents). Let the local residents know what operations would be occurring at what times, including when operations would start and when they would finish each day. Post signage, updated daily, at the entry points of the site provide current construction information, including schedule and activity.
- Limit, to the extent possible, construction and associated heavy truck traffic to occur between 7:30 AM and 6:00 PM during normal, weekday work hours. This measure would reduce noise effects during sensitive nighttime hours.
- Locate stationary equipment as far away from sensitive receptors as possible.
- Select material transportation routes as far away from sensitive receptors as possible.

- Shut down noise generating heavy equipment when it is not needed.
- Maintain noisy equipment per manufacturer's recommendations.
- Encourage construction personnel to operate equipment in the quietest manner practicable (e.g., speed restrictions, retarder brake restrictions, engine speed restrictions, etc.).
- Observe local noise ordinances at all times.
- Locate stationary operating equipment as far away from surrounding residents as possible. Shut down heavy equipment and other noise emitters when it is not in use.
- Dilapidation surveys will be carried out on adjoining structures to identify potentially susceptible to vibrate damage. Excavation methodologies will be developed to minimize the impacts on adjoining properties.
- Noise mitigation equipment to be fitted to construction plant, machinery and equipment.
- Position concrete pumping operations in locations to cause minimum effect to neighbors.
- Use of electric equipment where possible to cause minimal effect (e.g., cranes).
- Position rubbish removal operations in locations to cause minimum effect to neighbors.
- Hoardings and appropriate sound screening to be employed to ensure separation on construction activities from adjoining neighbors.
- No work is to occur outside approved hours.
- Consultation with all adjoining property stakeholders during the construction phase to inform of timing of any construction works which may impact on their operations.

5.11.2. Noise Abatement During Excavation

- Noise mitigation equipment to be fitted to construction equipment.
- Excavation of loose or easily breakable sandstone blocks by bucket.
- Progressive breakage from open excavated face.
- Selective breakage along open joints where they are present.

- Use of rock hammers in short bursts to prevent generation of resonant frequencies.
- Orientation of the rock hammer picks away from property boundaries and into the open excavation.
- Rock-saw cutting to perimeter of excavation prior to rock breaking to minimize transfer of vibrations and the need for rock support measures.
- Minimize use of heavy rock breaking equipment closer than 10 m to property boundaries to adjoining properties.
- Rock-saw cutting or rock cracking using expansive grouts or similar technology to break rock into smaller blocks prior to rock hammering.
- Commencement of excavation as far from structures as possible and monitoring of vibration while working towards these buildings.
- On-site monitoring of noise and vibration outputs by a qualified acoustic engineer during construction.

5.11.3. Noise Abatement During Demolition Activities

- Noise mitigation equipment to be fitted to construction plant, machinery and equipment.
- Where appropriate certain elements will be removed by hand and stacked for removal.
- Concrete pulverizer will be used to demolish structural elements where appropriate.
- No work is to occur outside approved working hours.
- Consultation with all adjoining property stakeholders during the demolition phase to inform of timing of any demolition works which may impact on their operations.

5.12. ASBESTOS AND LEAD BASED PAINT PROGRAM

5.12.1. Asbestos Containing Material (ACM): The Contractor shall ensure that all areas requiring demolition or renovation have been inspected for asbestos prior to work beginning. Should asbestos be present, all personnel participating in asbestos activities shall be accredited in accordance with (IAW) all Federal, state, local, and Tampa VAMC requirements. Obtaining an asbestos removal permit is the responsibility of the Contractor. A copy of all permits and disposal documentation will be provided to RE, COE, and Tampa VAMC GEMS Coordinator. Asbestos bags will be clearly marked with the generator labels. The Contractor must dispose of all asbestos materials generated at City approved landfills for asbestos. The

Contractor must comply with Tampa VAMC procedures for asbestos abatement.

5.12.2. Lead-Based Paint (LBP): Contracts to prepare previously painted surfaces for repainting must address LBP through sampling and analysis. Where LBP is identified for removal or refinishing, the Contractor must ensure this work is done in accordance with all Federal, state, and local regulations. The OSHA Standards for Lead Construction (29 CFR 1926.62) regulates the work practices for lead-containing materials. Under this standard, the employer is required to make an initial determination if any employee's exposure to lead will exceed the action level of 30ug/m^3 averaged over an 8-hour day. This initial determination requires the employer to monitor worker's exposure unless he or she has objective data that can demonstrate conclusively that no employee will be exposed to lead in excess of the action level. All residues from painted and stained surfaces presumed to contain LBP is classified as a hazardous waste under RCRA. The Contractor is responsible for determining whether the waste qualifies as a hazardous waste due to its lead content. The contractor is also responsible for disposal of hazardous wastes, hazardous waste due to lead content included, IAW all Federal, state, and local regulations.

5.12.3. Paint with a lead content of 5,000 ppm (or 0.5% by weight) or greater cannot be recycled.

5.13. TANK PROGRAM

5.13.1. Underground Storage Tank: Comply with Construction Specification Section 02 65 00, Underground Storage Tank removal.

5.13.2. Aboveground Storage Tank: If the project will install aboveground storage tanks (AST), either temporarily or permanently as part of the Project, the ASTs will be of double-wall construction, with the capability to monitor and drain the annular space. The AST will be equipped with primary and emergency vents, a method to gauge the level of contents (such as a Clock Gauge), a spill bucket at the fill port, and an audible overfill alarm. Permanent AST installations will be placed on a concrete pad (to prevent settling), and all ASTs will be of the type that allow for the inspection of the bottom of the tank (as well as of the sides). Coordinate with Tampa VAMC GEMS Coordinator for approval on the correct AST to be installed.

5.14. PEST CONTROL MANAGEMENT PROGRAM

5.14.1. The Contractor shall apply all pesticides IAW the requirements of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), using pesticides approved by the EPA and by following the manufacturers' inspections on the label. Contractor shall coordinate application of pesticides during construction with Tampa VAMC GEMS Coordinator. Pesticide spills meeting RCRA criteria, must be managed as HW.

Contractor must follow all Federal, state and Tampa VAMC's environmental requirements in proper management and disposal of spills.

5.14.2. Licensing and Certification: All pesticide application shall be performed by a Contractor certified in the EPA category or categories that cover the work to be performed and shall hold a valid business license. For work on Tampa VAMC, the Contractor shall be certified and licensed by the State of Florida. The Contractor shall present evidence of such licensing and certification to Tampa VAMC GEMS Coordinator for approval prior to beginning work under this project.

5.15. PROTECTION OF PUBLIC AND ADJOINING BUILDINGS

5.15.1. "B" class hoarding and scaffold to be established and maintained to roadways to ensure safe public access pathways.

5.15.2. Scaffold or screen protection to buildings to ensure no damage occurs.

5.15.3. Ensure appropriate traffic control measures are employed to ensure separation of construction activities from public.

5.15.4. Approve traffic management plan with authorities prior to works commencing.

5.15.5. Ensure appropriate directional signage is in place for access pathways and trafficable areas.

5.15.6. Barriers and hoardings in place to ensure no unauthorized access to construction zones.

5.16. PROTECTION OF AIR NAVIGATION

5.16.1. On June 30, 2015, Federal Aviation Administration (FAA), Southeast Region, Atlanta, Georgia issued determination of no hazard to air navigation for construction and operation due to crane and building height details. The contractor will submit FAA application form. FAA has indicated that 4-6 weeks are required for review and approval.

Section 01 10 10
Design Requirements

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8 STRUCTURAL DESIGN
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9 HEATING, VENTILATING AND AIR CONDITIONING (HVAC)
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10 SECTION NOT USED
11 PLUMBING
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12 SECTION NOT USED
13 FIRE PROTECTION – BED TOWER
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15.1 Exterior Electrical System
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16.4 Facility Type
16.5 Electric Security System (ESS)
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16.7 Intercommunications
16.8 Security System Integration
16.9 Operations Room/Security Control Center (SCC)
16.10 Security Systems Power
16.11 Site
16.12 Emergency Vehicle/Loading Dock Access
16.13 Emergency Blue Light Station
17 LOW VOLTAGE, TELECOMMUNICATION
17.1 Reference Documents

17.2 General System Requirements
17.3 Site Communications
17.4 Telecommunications
17.5 Public Address System
17.6 Intercommunications Systems
17.7 Television Systems
17.8Nurse Call System
17.9 Distributed Antenna System (DAS)
17.10 Provide a Mass Notification System in accordance with the Fire Alarm UFC Standards and in accordance with the PTS and ESR documents.
18 CORROSION CONTROL AND CATHODIC PROTECTION
19 ENVIRONMENTAL – HAZARDOUS MATERIALS
20 SUSTAINABLE DESIGN
20.1 Sustainable Drivers and Federal Mandate Compliance
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20.3 LEED Compliance Matrix
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21.3 Third Party Commissioning Agent (CxG)
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Section 01 10 10
Design Requirements

1 DESCRIPTION OF FACILITY AND SCOPE

1.1. The Contractor shall design and construct the New Bed Tower Addition with and integrated Utility Plant and defined surrounding site improvements at the James A. Haley Veterans' Hospital (JAHVH) VAMC Tampa Medical Center, Tampa Florida to result in a complete and usable facility based on Statement of Work and Technical Specifications contained within this this solicitation.

1.1.1 Requirements stated in this RFP are minimums.
1.1.2 The intent of the Government is to emphasize the placement of funds into the functional/operational requirements.

1.2. MISSION STATEMENT: "To Foster a Veteran and Family Focused Environment of Care" the New Bed Tower Addition and supporting components are intended to provide a facility for state-of-the-art healthcare to "Serve Those Who Have Served".

1.3. Scope of Work – Primary Construction

1.3.1 BED TOWER: The new bed tower addition (NBT) at the James A. Haley Veterans' Hospital (JAHVH) is a 222,804 gross square foot (GSF) building gross square feet minimum and connected to the existing Building 1, Main Hospital. In accordance with the Space Program For Design, the new addition will contain 100 Medical/Surgical Nursing (MS&N) inpatient beds, 40 Intensive Care Unit (ICU) beds, associated support space, lobby, public amenities, a Canteen (public dining facility) a security office, patient drop-off & entry, and pharmacy office and training suite and other spaces noted in the Program for Design in **Appendix E**. The NBT shall connect back to the existing Building 1 bed tower which is the original hospital on-site. The addition will serve as the new main entry for the hospital. Refer to Appendices E and F, for Program for Design, Room Guideplates and Conceptual Planning and Design information.

1.3.2 BED TOWER CANTEEN: The Canteen, shall be a new full service public dining facility (open to visitors, outpatients and staff), and is intended to be a prominent functional space at the NBT's Level 1. The Canteen management and food preparation shall be integrated in with the Nutritional Services that serve patient beds.

1.3.3 BED TOWER - NUTRITIONAL SERVICES SUPPORT: This new and integrated with Canteen Services, Nutritional Service's commercial kitchen spaces will provide on-demand ordering to serve the NBT patient bed floors.

1.3.4 BED TOWER CONNECTIONS - Connect the New Bed Tower lobby to the adjacent Ground and First Floor Levels of existing Building 1. Connect the New Bed Tower building ICU Beds on Level 2 to the Building 1 surgery suite on Level 2. There shall be no ramped connections between Ground, First and Second Levels from the new Bed Tower to the Existing Building 1. Ramped connections are discouraged to Level 3 and above floors also.

1.3.5 BED TOWER UTILITY PLANT: The components and systems defining a Satellite Bed Tower Utility Plant, with programmatic area of 6,000 gross square feet that is not defined in the 222,804 noted in section 1.31 above, shall be built integrated into the NBT footprint, with exception of the cooling tower components. The Bed Tower Utility Plant

primary components are defined in narrative form in Part 9 below of 01 10 10 and will be defined graphically in **Appendix E**.

1.3.6 SITE WORK IMPROVMENTS: Site work and utilities associated with construction will support the NBT addition in a formal, dedicated construction site areas defined in **Appendix J.** This includes the reconfiguration of the existing Diamond surface parking lot, a new entry drive to the New Bed Tower and partially refurbished and expanded new Richard Silver Way entry drive from the east property line to the east side of the existing Fisher House.

1.3.7 SITE UTILITY REOLCATION, REROUTING and EXTENSIONS: There are numerous utility systems illustrated in **Appendix Z** new site utility drawings, that are also interspersed with existing drawings, contained in the Appendices noted in the last sentence of this Section 1.3.7. The utility system points of connections will generally tie in to exterior areas outside of the formal, dedicated construction sites, to the north east and south. Utility system points of connections will of the formal, dedicated construction sites within existing Building 1 Basement and Ground levels, sometimes in areas with hazardous materials. Refer to **Appendices K, M, N, O, P, Q, R and S**, for detailed new and existing information regarding these systems

1.3.8 Refer Appendix F, for graphic information that defines the land area that will contain the above project elements.

1.4. Scope of Work – Enabling Early Demolition, Construction

1.4.1 The following smaller sized sub-projects and infrastructure upgrades are part of the NBT's scope of work and shall be designed and constructed to support the proper functional operational of the NBT and the JAHVA hospital overall.

1.4.2 BUILDING 30 NURSING HOME ENTRANCE OPTIONS:
The Building 30, existing main entrance on Level 1 will be transformed to function pedestrian accessible only, and will be accessed via the NBT addition's main entrance. All nursing home patients and visitors will traverse through the NBT addition to a new exterior covered walkway leading to the Building 30 existing main entrance. During construction a temporary separate entrance to Building 30 on the north east side of the campus shall be provided. Refer to **Appendix J** for Phasing Information.

1.4.3 DEMOLITION OF BUILDING T-72 REQUIREMENT:
Removal of modular building housing the Geriatric Clinic, and relocation of the Geriatric Program to currently vacant space in the existing Building 1, Main Hospital.
Building T-72 is located within the footprint of the proposed tower. The Geriatric Program will move to Building 1and be accessed through the NBT lobby.

1.4.4 EMERGENCY DEPARTMENT ENTRY MODIFICATION – REQUIREMENT:
Expansion of vehicle drives and patient parking adjacent to the existing Building 1 Emergency Department. A newly configured Ambulance entrance addition shall be provided. The newly configured Ambulance entrance bay is required to avoid congestion with the new bed tower drop-off & entry and comply with VA Mission Critical Facility Security Requirements.

1.4.5 MODIFICATIONS TO USF PEDESTRIAN BRIDGE – REQUIREMENT:
Partial demolition and renovation of the existing Pedestrian Bridge linking JAHVH to the

University of South Florida College of Medicine, as required to facilitate continuous operation of the bridge, construction of the new tower and connection of the bridge thereto. The pedestrian bridge spans six-lane Bruce B. Downs Boulevard.

Modifications include demolition, connection to the new tower's Level 1 and construction of a required egress stair near the inside of the JHVAH property line to allow for Bridge use to continue during construction. The stair and existing Bridge shall be incorporated into the final tower design, with and new Bridge Extension to the NBT. It shall be noted that the Bridge is approximately 4'-3" above the existing first floor lever. Refer to **Appendix K** for specific information.

1.4.6 Refer Appendix F and J for graphic plan area information that defines the area that will contain the above project elements

1.5. Statement of Iterative Design Process

1.5.1 The Government requires iterative design after award. Refer to Section 01 10 12.

1.5.2 The focus of the iterative design process shall be to technically execute the building design and planning, referencing the conceptual diagrams noted in **Appendix F**. It shall also be to finalize room-by-room programmatic needs with each Department in the Bed Tower and integrated Utility Plant with the client/Owner representatives. Minor changes in each Department need to be supported by the Contractor in planning and confirming the information noted in **Appendices E & F.**

1.5.3 Iterative design process has the following restrictions: The site location area of the building and the defined relationships of the Bed Tower's primary departmental components defined in **Appendix F** shall not change. The integrated Bed Tower Utility Plant primary components defined in narrative form in Part 9 below of 01 10 10 shall not change, however their final locations may be adjusted within the plan area.

2 DESIGN REQUIREMENTS

2.1 The project shall be designed and constructed in accordance with all government requirements, regional and national applicable codes, in accordance with the criteria contained herein, using industry standard materials and efficient practices.

2.2 The Contractor shall be responsible for all professional quality, code compliance, technical accuracy, coordination of all designs, drawings, specifications and other documents or publications upon which design and construction are based. The general documents and standard order or precedence are:

1. Section 01 10 10
2. Appendix D – 2015 VA CFM Physical Security Design Manual (specifically edited for use and implementation at the JAHVA site for this project)
3. Department of Veteran Affairs – CFM VA TIL facility standards
4. The Contractor and AE2 Designer of Record shall review Design Alert 147, issued by the VA CFM on 9-1-2016 that resides online at *www.cfm.**va**.gov/**til**/*

2.3 The following text taken from VA PG18-3 The Public Buildings Amendment Act of 1988, Public

Law (Pub. L.) 100-678 requires Federal agencies to follow national recognized "model" building codes. "{The Federal Participation in the Development and Use of Voluntary Standards, Office of Management and Budget (OMB) Circular A-119, requires all executive agencies to rely on voluntary standards, both domestic and international, whenever feasible, and to participate in voluntary standard bodies.}"

2.4 The VA has adopted the latest edition of the following codes and standards as a minimum for all projects performed in the modernization, alteration, addition, or improvement of its real property and the construction of new structures. The initial issue date of this RPF shall be the effective date for the model codes, standards and VA design guides to be used as a minimum for this project's design. The date of initial issue of this RFP to the Design-Build Proposer Teams is defined by the Contracting Officer. The latest issue of model codes, standards, or VA design guides shall be used, unless noted specifically in the List of Model Codes and Guidelines section below. This may include documentation in the VA Technical Information Library (http://www.cfm.va.gov/til/), some which could noted as "DRAFT" documentation. Future changes to model codes, standards and VA design guides after the initial date of RFP issue to the Design-Build Proposer Teams by the Contracting Officer are not applicable to this project, unless the selected Design Builder and the Contracting Officer mutually agree to any revisions proposed for the betterment of the project.

2.5 The design developed to deliver this project shall comply with all contents of VA Handbook PG-18-15, Volume B and the following criteria, codes and standards listed List of Model Codes and Guidelines section below. The Design-Build Contractor, particularly its designated Designers of Record (DoRs), shall update the versions of applicable criteria to those in effect at the time when the Design-Build Contractor had completed its proposal response and submitted it to the Contracting Officer, including those criteria referenced in VA Handbook PG-18-15 and all other applicable federal laws and regulations.

2.6 List of Model Codes and Guidelines:

The design shall be in accordance with the project requirements specified in this RFP; and in accordance with the VA Design Manuals and Master Specifications that specify codes and standards the VA follow on its projects. The design shall be in accordance with the project requirements specified in this RFP; and building codes, standards, and executive orders including but not limited to the following:

- Guidelines for Design and Construction of Hospitals & Healthcare Facilities, 2014 edition, published by the Facility Guideline Institute (FGI) shall be used as referenced for "industry guidance", where other information does not exist.
- Florida Building Code, Building 2014 edition
- VA Directives, Design Manuals, Master Specifications, VA National CAD Standard Application Guide, and other Guidance on the Technical Information Library (TIL) (http://www.cfm.va.gov/til/).
- DVA Sustainable Design Manual, May 2014
- International Building Code (IBC) For order of precedence of Life Safety Features and Systems requirements specifically referenced in VA Design Documents, refer to Section 2.7 below)
- Florida Building Code 2014 Edition Chapter 16 Structural Codes and Requirements (defining structural system and building envelope design, specific to this project site in Tampa, shall take precedence over equivalent sections of the IBC).
- NFPA 101 Life Safety Code (Refer to Section 2.7 below)

- NFPA National Fire Codes with the exception of NFPA 5000 and NFPA 900
- Occupational, Safety and Health Administration (OSHA) Standards http://www.osha.gov/

- VA Physical Security Design Manual 2015 Edition, that references the applicable United Facilities Criteria (UFC) regarding Antiterrorism Standards for Buildings 4-010-01, Design of Buildings to Resist Progressive Collapse4-023-03, Design and Analysis of Hardened Structures to Conventional Weapons Effects 3-340-01
- Design Instructions to Architect & Engineers, Department of Veteran Affairs.
- National Electrical Code (NEC)
- International Plumbing Code (IPC)
- Safety Code for Elevators and Escalators, American Society of Mechanical Engineers (ASME) A 17.1.
- ASME Boiler and Pressure Vessel Code
- ASME Code for Pressure Piping
- Architectural Barriers Act Accessibility Standards (ABAAS) including VA supplement, Barrier Free Design Guide (PG-18-13)
- Building Code Requirements for Structural Concrete, American Concrete Institute (ACI 318)
- Steel Construction Manual, American Institute of Steel Construction (AISC)
- Minimum Design Loads for Buildings and Other Structures, American Society of Civil Engineers (ASCE 7)
- Energy Independence and Security Act 2007 (EISA)
- Energy Policy Act of 2005 (EPAct)
- DOE Interim Final Rule: Energy Conservation Standards for New Federal, Commercial and Multi-Family High-Rise Residential Buildings and New Low-Rise Residential Buildings, 10 CFR Parts 433, 434 and 435.
- Federal Leadership in High Performance and Sustainable Buildings: Memorandum of Understanding (MOU)
- USGBC LEED for Healthcare
- Executive Order 13514: Federal Leadership in Environmental, Energy, and Economic Performance
- The Provisions for Construction and Safety Signs. Stated in the General Requirements Section 01 00 00 of the VA Master Construction Specification.
- Ventilation for Acceptable Indoor Air Quality – ASHRAE Standard 62.1- 2007.
- Ventilation for Healthcare Facilities – ASHRAE Standard 170 - 2008
- Safety Standard for Refrigeration Systems – ASHRAE Standard 15 – 2007.
- UFC 1-200-02: High Performance and Sustainable Building Requirements

- American National Standards Institute (ANSI)
- Institute of Electrical and Electronics Engineers (IEEE)
- National Electrical Manufacturers Association (NEMA)
- American Society for Testing and Materials (ASTM)
- Illuminating Engineering Society of North America (IESNA)
- National Electrically Testing Associated (NETA)
- Underwriters Laboratory, Inc. (UL)

2.7 Notes Clarifying List of Model Codes and Guidelines:

1. NFPA 101 primarily addresses life safety and fire protection features while the IBC and FBC address a wide range of considerations, including, but not limited to, structural strength, seismic stability, sanitation, adequate light and ventilation, and energy conservation. VA

buildings must meet the requirements of NFPA 101 and documents referenced by NFPA 101 in order to comply with the accreditation requirements of The Joint Commission. Therefore, designs shall comply with the requirements of the latest edition of NFPA 101 and documents referenced therein. Design features not addressed by NFPA 101 or documents referenced therein shall comply with the requirements of the latest edition of the IBC or as otherwise addressed above in this Program Guide. For design features that are addressed by both the IBC as well as NFPA 101 or a document referenced by NFPA 101, the requirements of NFPA 101 or the document referenced by NFPA 101 shall be used exclusively (this applies even if the IBC requirements are different).

2. Conflicts between Nationally Recognized Codes and Standards and VA Requirements – Should a conflict exist between VA requirements and VA adopted nationally recognized codes and standards, the conflict shall be brought to the attention of the Contracting Officer (KO) . The resolution of the conflict shall be made by the authority having jurisdiction for the KO to ensure a consistency system wide.

2.8 VA Organizational Goals to Improve the Environment of Care:

The following nine goals are referenced directly from the VA Technical Information library http://www.cfm.va.gov/TIL/ and the "*Executive Summary of the Report of the Task Group for Innovative 21 Century Healthcare Environments for the VA Healthcare Delivery"*, dated June 2009.

1. Care Optimization:
   Provide more effective and efficient building environments that can flexibly accommodate and adapt to more optimized functional processes and procedures.

2. Healing Environments:
   Provide buildings designed to support the creation of optimal healing environments that reduce adverse health and safety threats, improve health outcomes, expedite patient recovery, and promote the overall health and well being of occupants, the communities in which facilities are located, and global environmental conditions.

3. Satisfaction:
   Provide building environments that respond to veteran, family, and staff needs and provide for a more satisfying healthcare experience for these populations.

4. Adaptability:
   Provide transformable building environments that accommodate changing needs, functional programs, and care-delivery practices over time.

5. Sustainability:
   Provide sustainable building environments that meet the needs of the present without compromising the ability of future generations to meet their own needs.

6. Building Operations and Maintenance:
   Provide more effective and efficient building environments through innovative monitoring, operations, and maintenance.

7. Building Acquisition:
   Provide more effective and efficient strategies for the acquisition and delivery of new

healthcare buildings and for their ongoing adaptation and expansion.

8. Data Acquisition:
   Provide self-monitoring facility environments that become a source of research data and information.

9. Continuous Innovation:
   Develop new solutions for optimum coordination of best practices in healthcare and in the design, adaptation, and operations for the transformation of healthcare facilities that will provide 21st-century care.

3 GENERAL REQUIREMENTS AND DEFINITIONS PERMITTING REQUIREMENTS, LIFE SAFETY FEATURES AND SYSTEMS AND PROJECT SPECIFIC SECURITY REQUIREMENTS

3.1 General Requirements and Definitions
3.2 Permitting Requirements
3.3 Life Safety Features and Systems

3.3.1 The successful Design-Build contractor shall identify and prepare a single, consolidated list of codes, standards, and other criteria for all disciplines to follow for this project.

3.3.2 The successful Design-Build contractor shall designate a single individual as the FPE DoR, who shall have working knowledge of all five major aspects of fire protection engineering, including fire suppression, fire alarm-mass notification, fire detection, fire extinguishment, and life safety. This means that the successful Design-Build contractor shall not further breakdown responsibilities of the FPE among multiple subcontractors. The FPE DoR shall ensure project meets all requirements of identified applicable criteria, including but not limited to, Construction Type, Building Separation, Interior Finish, Site Considerations, Barriers, Protection of Openings, Suites, Exit Signage, Door Locking Requirements, Special Protection Requirements, Occupancy Classification, Water Supply for Fire Protection, Fire Extinguishing Systems, and Fire Alarm Systems.

3.3.3 Whenever the term "Fire Protection features and Systems" is used in the RFP, it shall be understood that this specific term refers to those features, including but not limited to, fire suppression, fire extinguishment, fire alarm, fire detection, and emergency communication. Refer to section 13 of 01 10 10 below for design requirements regarding specific fire protection systems.

3.4 Project Specific Security Requirements

4 SITE

4.1 Civil Engineering & Landscape Architecture Design - Site Planning Criteria

4.1.1. The Contractor shall prepare final site drawings, specifications, and engineering calculations necessary to support the design and construction and to fulfill the requirements of this RFP. This includes, but is not limited to: demolition, design, engineering and construction of all grading, drainage, foundations, road work, paving, parking, pedestrian access, landscaping, utilities and all permits (including fees) required for fully operational facilities. All utilities internal to the site will be underground. Fire fighting water must be available on site prior to delivery of any combustible materials.

Refer to **Appendices C, D, F, and J** for site planning – existing, temporary/phasing and new conditions and **Appendices K through R** for site engineering information.

4.1.2. Develop the project site and perform all off-site work necessary to meet the requirements of the project, antiterrorism criteria, local codes, reference standards, technical specifications and performance criteria.

4.1.3. Minimize the impact of construction activity on operations and neighboring facilities.

4.1.4. The project includes development of a New Bed Tower (NBT)

4.1.5. In relation to the site location and development of the NBT, other site related activities will need to be addressed and mitigated for a successful project outcome:

4.1.5.1. Modification of the existing secondary vehicular entry from Bruce B. Downs nearest the overhead pedestrian bridge.

4.1.5.2. Reduction of the designated Opal and Diamond parking lots. Both parking lots exist in the anticipated site location for the NBT.

4.1.5.3. Reconfigure main entry drive onto VA campus from Bruce B. Downs.

4.1.6. Areas available for demolition and new construction shall be limited to the actual defined construction site area.

4.1.7. The engineering design requirements and criteria for the Sitework section herein, shall be in accordance with the requirements specified within this section and with the codes and references listed in section 2.6 above.

4.1.8. The site improvements system consists of pavements and pavement related features, landscaping and other exterior site development work related to this project. Provide a pavement design by a licensed Professional Engineer familiar with conditions local to the project site. Site design, including but not limited to design of parking and pedestrian circulation, will include coordination of the Design-Builder's Civil Engineer and the Landscape Architect.

4.2 General Civil Planning & Design Requirements

4.2.1. Site Planning Objectives: Site the building such that it contributes to a sense of community on the installation and promotes pedestrian use.

4.2.2. Location of Facility

4.2.2.1. In addition to all applicable VA design requirements, the A/E shall design the site with the intent to meet the local zoning requirements where compliance can be practically applied. It should be noted that projects on Federal property are exempt from local zoning review and approval.

4.2.2.2. This facility has been classified as "mission critical". The site shall be designed to comply with the VA Physical Security Design Manual for Mission Critical Facilities **(Appendix D).**

4.2.2.3. Facility location shall seek to work with the site's natural topography and otherwise minimize impact on existing features and site drainage.

4.2.2.4. Preserve and maintain to the greatest extent possible, natural drainage areas and existing drainage paths to avoid the additional cost of site work to reestablish drainage patterns.

4.2.2.5. Facility location shall improve and enhance linkages and connections to surrounding destinations and neighborhoods.

4.2.2.6. Use and design of setback space can enhance security and safety of employees and better integrate the building into the community.

4.2.3. Linkages and Connections to Key Facilities

4.2.3.1. As noted in Section 1.4.2 above, enhance the main entry to Building 30 (Haley's Cove Community Living Center).
4.2.3.2. Provide connections of Building 1 (Main Hospital) and NBT.
4.2.3.3. Extend pedestrian bridge across Bruce B. Downs connecting USF Campus into design of NBT.

4.2.4. Building Entrances

4.2.4.1. Entrance locations are critical to buildings and shall be readily identifiable to anyone using the building.
4.2.4.2. Vehicle parking and pedestrian circulation should visually and physically guide visitors to building entrances.
4.2.4.3. The Main Entrance to the NBT shall be located within reasonable walking distance from vehicular parking and accessible parking areas and shall be located within 250' walking distance from vehicular parking and accessible parking areas.

4.2.5. Outdoor Building Uses

4.2.6. The sitework design required for this project shall include, but may not necessarily be limited to the items listed within this section. Designs shall comply with the VA Site Development Design Manual (latest edition) and all references therein.

4.2.7. Site Functional Requirements: The site shall be designed to incorporate required patient and staff vehicle parking; vehicular access by patient and staff, service vehicles, and emergency vehicles; site lighting; all on-site grading; site drainage; the requirements of **Appendix D**; horizontal and vertical domestic water supply, fire suppression system supply, sanitary sewer, wastewater collection system, sidewalks and Landscape Enhancements. Additionally, the design shall provide an ambulance access route to the existing ER and drop-off/pick-up point to the new bed tower which meets requirements of **Appendix D**.

4.2.8. Site Clearing, Demolition and Removal: The Contractor shall provide layout surveying as necessary to locate the new work items prior to initiating site clearing and demolition work. Contractor shall take such measures as necessary to protect existing vegetation, trees, and undergrowth. Limits of clearing shall be approved by Contracting Officer's Representative (COR). Erosion and sediment control BMP's shall be in place and approved by the COR prior to initiating work. The Contractor may utilize the utilities during construction operations as approved and may incorporate the utilities as part of the final project. Existing utilities that interfere with this project shall be relocated as necessary. The contractor shall be responsible for verifying size, type, and location of utilities. All site clearing material and demolition debris shall be removed from the limits of the Medical Center and disposed of in a manner as required by law and Department of Veterans Affairs regulations. The Contractor shall be responsible for all disposal permits and regulations requirements. Surplus satisfactory excavated material not required for fill shall be disposed of off the Medical Center, unless directed otherwise by Contracting Officer's Representative. Refer to **Appendices K, M, O, P, Q and R** for site utility information.

4.2.9. Recycling: Provide space at dumpster areas for recycling receptacles. Coordinate with COR on receptacle types, sizes and access requirements.

4.2.10. Existing Utilities: On-site utility locations for this site are included as part of this RFP. Refer to Part 4.6.

4.2.11. Utility Procedures: Water and sewer service for the Medical Center if provided by the City of Tampa. All connections to these systems shall be in accordance with City of Tampa and Department of Veterans Affairs standards. Natural gas service is provided by TECO. Contractor shall coordinate with the respective utility provider for connections.

4.2.12. Contractor shall coordinate via the COR, with the Medical Center's engineering group to verify capacity of existing utilities. The Contractor is responsible for providing connections to all site utility services unless explicitly stated otherwise.

4.3 Geotechnical Investigation and Engineering Design

4.3.1. Subsurface soil information, including a geotechnical report for the Phase 4 New Bed Tower and Infrastructure Improvements are included in **Appendix L**. This information is for general site characterization only.

4.3.2. Any included subsurface information is only for the Contractor's information and is not guaranteed to fully represent all subsurface conditions. The Government will not be responsible for any interpretation or conclusion by the Contractor drawn from the data or information.

4.3.3. Any geotechnical report accompanying the subsurface information is provided only to better convey data (boring logs, testing, etc.) or to document observed site conditions. The assumptions, analysis, and recommendations of any accompanying report were developed for preliminary planning purposes only and may not reflect present project requirements. Requirements stated within this RFP take precedence over any content of any included existing geotechnical report. The Contractor is required to retain a Geotechnical Engineer experienced and licensed in the geographic region of the project to interpret the Government provided information as related to his design concept and develop geotechnical requirements to support design and construction. Contractor's Geotechnical Engineer shall perform additional geotechnical work as required to provide specific engineering recommendations for the site design.

4.3.4. Anticipate minor variations in subsurface conditions between borings. The Contractor is responsible for all costs associated with the site preparation, ground improvement and foundations except as allowed by Contract Clause FAR 52.236-2, "Differing Site Conditions". The Contractor's Geotechnical Engineer must perform additional subsurface investigation/testing as required to adequately determine all applicable geotechnical factors including the type and capacity of the project foundations. The Contractor's Geotechnical Engineer is required to evaluate the provided information and any additional information obtained and prepare a report as described in other portions of this RFP.

4.3.5. Perform the soils investigation at the site for use in the design and construction of the new facilities. Perform, at Contractor's expense, such subsurface exploration, investigation, testing, and analysis as Contractor's Designer of Record deems necessary for the design and construction of the building foundations, pavement section(s), stormwater management facility(ies), utility structure foundations, etc. Prepare a report including laboratory analysis of samples and recommendations for foundation and pavement design by a professional engineer as specified and in accordance with and the VA Site Development Design Manual and the VA Parking Design Manual.

4.3.6. The Contractor shall certify in writing that the design of the project has been developed consistent with the Contractor's provided geotechnical report.

4.3.7. Observed site conditions which may present a challenge during design/construction include documented sinkhole formation on previous projects at the Medical Center. Although sinkholes or unsuitable soils have not been observed in the proposed project

area, the Contractor will anticipate the possibility of sinkholes or unsuitable soils and incorporate measures into his design and construction procedures to obtain required soil support while maintaining progress for completion on schedule.

4.3.8. Provide personnel under the supervision of a registered Professional Engineer to inspect excavations and soil/groundwater conditions throughout construction. The Engineer is required to perform pre-construction and periodic site visits throughout construction to assess site conditions. The Engineer, with the concurrence of the Contractor and the KO and COR, is required to update the excavation, sheeting, shoring and dewatering plans as construction progresses to reflect actual site conditions and is required to submit the updated plan and a written report (with professional stamp) at least monthly informing the Contractor and Contracting Officer of the status of the plan and an accounting of Contractor adherence to the plan; specifically addressing any present or potential problems. The Engineer must be available to meet with the Contracting Officer at any time throughout the contract duration. The Contractor is responsible for all costs of the Engineer.

4.3.9. Geotechnical Testing: Compaction tests shall be performed on each layer of compacted material placed. Testing shall be the responsibility of the Contractor. The Contractor shall remove and replace nonconforming materials and shall re-compact and retest failed and replaced areas until the specified degree of compaction is obtained. The Contracting Officer may direct that the tests be taken at locations other than those shown on the submitted compaction test plan and that additional tests be taken to supplement these required tests.

4.2.6.1 Compaction Test Plan and Data: The Contractor shall submit the initial compaction test plan to the Contracting Officer prior to beginning earthwork activities on the work item. Plan and Data shall include the following:

- Compaction Test Plan shall show the exact location of each test. This plan shall be keyed to the test results.
- Test Record – the record of each test shall reflect the type of test procedure(s), the firm or person that performed the test, the project title and contract number.
- Test Results and other Data – log and compile the results of each test and any observation made, and for compaction tests, the volume or unit weight of the standard, and the volume or unit weight of the compacted soil.

4.2.6.2 Roadway, driveway and parking area (Size 1) Compaction Tests: The number of density tests required for roadways and driveways up to 300 feet in length and parking areas up to 6000 s.f. shall conform to the following requirements for each layer of material placed;

- Sub-base and Base Course – A minimum of two tests or one test for each 50 feet of length or each 1500 s.f. of area, whichever provides the greatest number of tests.
- Sub-grade – A minimum of two test or one test per 100 feet of length or per 2000 s.f. of area, whichever provides the greatest number of tests.

4.2.6.3 Roadway, driveway and parking area (Size 2) Compaction Tests: The number of density tests required for roadways and driveways over 300 feet in length and parking areas over 6000 s.f. shall conform to the following requirements for each layer of material placed;

- Sub-base and Base Course – A minimum of four tests or one test for each 150 feet of length or each 3000 s.f. of area, whichever provides the greatest number of tests.
- Sub-grade – A minimum of four test or one test per 200 feet of length or per 4000 s.f. of area, whichever provides the greatest number of tests.

4.2.6.4 Gradation tests shall be conducted on structural soil materials for structures, foundations, utility systems, roadways, driveways and parking areas. In-place structural soil materials shall be sampled and tested for gradation requirements at least once and for every change in borrow source. For these tests, gradation shall be determined in accordance with ASTM C 136, with ASTM C 117 used to determine minus No. 200 sieve material and ASTM D 422 used to determine minus 0.02mm materials.

4.4 Civil Design Requirements

4.4.1. Sidewalks: Sidewalks, ramps, landings, and guardrails shall be sized to meet handicapped requirements as required by the VA Barrier Free Design Standard. Sidewalk widths shall be as necessary to meet pedestrian traffic flow from the parking areas. All building entrances shall have a concrete sidewalk connected to it. The new concrete sidewalks shall not cross drainage swales, unless the Contractor has ensured that the storm water shall flow underneath the concrete sidewalk by a new storm drain pipe and new concrete sloped paved headwalls. Sidewalks shall have a minimum nominal thickness of 4-inches with 2,000 psi compressive strength. Contraction joints shall be spaced at 5-feet on center and expansion joints shall be placed 25-feet on center and at the intersection of walks and curbs. Maximum cross slope on sidewalks shall be 2 percent. Sidewalks may be used at other locations between the curb line around the new facility and the building face. Guardrails and handrails shall be provided which meet handicapped requirements. These may be anodized aluminum (clear or bronze finish) or walls with handrails compatible with the exterior design and materials of the new facility to coordinate with other building finishes.

4.4.2. Handicapped Access: Ramps shall be provided for handicapped access, if necessary. The number of parking spaces, and site and building access for the physically disabled shall be as required by the VA Barrier Free Design Standard.

4.4.3. Contractor Staging and Haul Routes: The Contractor staging shall be within the project site and haul routes shall be approved by contracting agent.

4.4.4. The construction site shall be kept neat and free of trash at all times.

4.4.5. Parking and Vehicle Circulation:

4.4.5.1 Circulation shall promote safe and efficient movement of vehicles and pedestrians.

4.4.5.2 The existing secondary vehicular entry from Bruce B. Downs nearest the overhead pedestrian bridge will be repurposed as a controlled access service entrance as part of this project.

4.4.5.3 The designated Opal and Diamond parking lots will be reduced. Both parking lots exist in the anticipated site location for the NBT.

4.4.5.4 Appendix D shall be followed with respect to distances between paved roads, parking, and structures.

4.4.5.5 Public Access

- Any improvements made to VA roadways entering public right of ways shall be coordinated and approved by the local jurisdiction.

- VA roadways shall be conducive with surrounding properties and their respective driveways.

4.4.5.6 Site Access and Circulation

- Reconfigure main entry drive onto VA campus from Bruce B. Downs.
- Circulation for visitors shall be separated from service deliveries as much as possible.
- Clarity for the patient as to the front entrance and location of parking shall drive design decisions.
- Site entrances project and image of the VA, therefore they shall receive the highest level of treatment and shall accommodate pedestrians as well as vehicles.

4.4.5.7 Drop-off at Building Entrances

- Drop-off shall be designed and provided at the main entrance to the NBT.
- Drop-off shall consist of several lanes to include a "drop off" lane where cars can pull off and park along, and still allow sufficient room for vehicles to pass through the drop-off area.
- Sufficient queuing space shall be provided to accommodate several vehicles (automobiles and larger transport vehicles) waiting to drop-off and pick up patients.
- The drop-off shall have a certain portion covered by a permanent canopy for the convenience of visitors and patients in inclement weather.
- The drop-off shall comply with **Appendix D.**

4.4.5.8 Emergency/Fire Department Access

- Fire Truck lanes must be provided so that all sides of the structure are accessible by the local fire department.
- Fire truck access must follow the NFPA and must be able to handle H30 loading.

4.4.5.9 Delivery Access and Emergency Vehicles

The existing loading dock at Building #1 will serve the NBT. Internal circulation shall be provided as indicated in Section 5 below.

The entry ramp to the Emergency Department completed in 2012 shall not be impacted by the NBT construction. Accessibility of this key building entry point must be maintained both during construction and in the final design.

4.4.5.10 Existing Mass Transit/ HART Bus Stops

Two currently serve the site (on 131st Avenue and Bruce B. Downs Blvd) and are indicated on drawings C1.06 in **Appendix C** and SHALL NOT be impacted by construction.

4.4.5.11 Temporary Traffic Control

Traffic flow within the VA as well as along adjacent roadways must be unimpeded. The contractor must provide temporary traffic control for vehicular, pedestrian and bicycle users to provide for continuity of movement and access to property and utilities. Temporary traffic control along adjacent rights of ways shall be coordinated and approved by the local jurisdiction. Temporary traffic control shall comply with Part VI of the Manual on Uniform Traffic Control Devices (MUTCD).

4.4.6. Parking: Parking spaces and parking lots shall comply with the Department of Veterans Affairs Parking Design Manual and the VA Barrier Free Design Standard.

4.4.7. Pavements: Pavements shall be designed in accordance with the Florida Department of Transportation (FDOT) FY 2016-17 Design Standards and January 2017 Standards Specifications. Pavements shall be designed using AASHTO HS-15 as a minimum design standard and to have a 20-year design life.

4.4.7.1 Parking: Contractor shall provide accessible parking spaces with appropriate accessible paths meeting the requirements of the VA Barrier Free Design Standard. The Contractor shall delineate an area immediately adjacent to the emergency vehicle access as a "no parking area". No parking shall be installed such that it blocks the emergency vehicle access. Contractor shall use American Association of State Highway and Transportation Officials (AASHTO) turning templates of the appropriate design vehicle in designing the site layout.

4.4.7.2 For any exterior mechanical yard, provide a maintenance vehicle access road constructed of either asphalt or concrete with curb and gutter if necessary to facilitate stormwater drainage.

4.4.8. Site Grading and Storm Drainage

4.4.8.1 Permitting: Contractor is responsible for all permit applications, compliance, and fees required with all regulatory authorities. Government shall receive copies of all applications and correspondence, Compliance is a requirement of the Contractor. Connection to the existing Storm water management system is required and shall comply with the requirements of the Southwest Florida Water Management District (SWFWMD). Development of the proposed site is currently permitted by an existing SWFWMD Environmental Resource Permit (ERP) of the following data;
Project Name: James A Haley Veterans Hospital
Permit Number: 2374 (multiple revisions)
The proposed project overlaps the boundary of Permit 2374.000. This revision is a permit issued in 1987 for a 2.1 acre parking lot; it appears no ponds were designed or constructed with this permit. Contractor shall verify with SWFWMD as to the current permitting procedures required at the time of construction. All permitting documentation shall be submitted to the Contracting Officer prior to submittal to SWFWMD.

4.4.8.2 The Medical Center is located within the Duck Pond watershed, which is considered to be a closed basin by SWFWMD. This project will qualify for an exemption from SWFWMD permitting if the activity results in less than 4,000 square feet of additional vehicular use area and less than 9,000 square feet of impervious area. If this project qualifies, the contractor shall apply for and obtain an exemption from SWFWMD. If the contractor's design exceeds these limits, the contractor must apply for and obtain an ERP Individual Construction Permit. If applying for an ERP, the following criteria must be demonstrated:

- Demonstrate that discharges from the proposed project area will not cause an adverse impact for a 25-year, 24-hour design storm event.
- Limit post-development 100-year discharge volume to the pre-development 100-year, 24-hour volume.
- Demonstrate that the site will not impede the conveyance of off-site flows.
- Demonstrate that the project will not increase flood stages up- or down-stream of the project area.

- Provide water quality treatment for the entire project area and all contributing off-site flows.
- The project discharges to Hillsborough Reservoir, Waterbody ID (WBID) 1443H, which is listed by the Florida Department of Environmental Protection (FDEP) as impaired for nutrients. Provide a net environmental improvement by performing a pre/post pollutant loading analysis based on existing land use and the proposed land use using the BMPTRAINS spreadsheet downloadable from UCF Stormwater Academy at https://stormwater.ucf.edu.
- Replace treatment functionality of any existing ditches to be filled.
- Provide compensatory treatment to offset pollutant loads associated with portions of the project area that cannot be physically treated.

4.4.8.3 The contractor shall be responsible for payment of SWFWMD application/review fees. If applying for exemption verification, a $100 fee is required. If applying for a SWERP Individual, a $273 online submittal fee will be required.

4.4.8.4 Meeting notes from a pre-application meeting with SWFWMD will be included in **Appendix G in** the 100% Submittal.

4.4.8.5 Regardless of whether an Exemption or ERP is obtained, the contractor must provide equivalent compensating storage for all 100-year, 24-hour riverine floodplain impacts. It should be noted that the southern portion of the Diamond lot lies within the mapped 100-year floodplain. Appropriate compensating storage must be provided for any fill within the floodplain.

4.4.8.6 Storm drainage system design shall be checked for a 100-year return event to insure no flooding of the new facility finished floor. All grades shall slope away from the finished floor slabs. Grade at building shall be 6" below finished floor and shall slope 2% for distance of 10 feet minimum. The Contractor shall establish the building finish floor elevation to provide positive drainage away from the building. The preferred slope for permanent banks and ditches is one (1) unit vertical in four (4) units horizontal.

4.4.8.7 The storm drainage shall consist of swales, storm drainage structures, piping and storm water management ponds. The structures shall include concrete drop or curb inlets, concrete headwalls, flared end sections and outlet control structures as necessary. All storm drainage structures located in traffic areas shall be rated to withstand heavy vehicle loading. Retention / Detention ponds, if required, shall be graded with flat bottoms at elevations required. The total area of ponds shall be minimized to meet SWFWMD requirements. All grading shall be completed such that parking areas and areas adjacent to the new building drain adequately with storm water flowing away from the building to the stormwater management system. Minimum pipe velocities shall be 2.0 ft/sec and the maximum shall be 5.0 ft/sec with outlet erosion protection. The minimum pipe size for an open pipe system shall be 18-inches and 15-inch for a closed system. The maximum allowable storm water pavement spread shall not exceed 4-feet in width for a 10-year storm event. Sufficient inlets shall be provided to control drainage spread. The maximum interval for inlets shall be 300 feet. No inlets shall be provided in curb radii. There shall be no ponding at inlets for a 10-year storm.

4.4.8.8 The allowable pipe types shall include concrete pipe, class III and IV and PVC ASTM 2241 and SDR 26 for roof drain leaders. Pipe joints shall be water tight with gaskets.

4.4.8.9 Concrete inlets/catch basins shall be precast concrete. All inlets and grates shall be FDOT approved. Precast manhole or inlet rings shall connect with industry standard gaskets. Storm drain pipes shall be grouted into the concrete structures to provide a watertight connection.

4.4.8.10 Catch Basins and Grates: Locate storm water inlets so that no collection swales flow across a street or sidewalk to reach a storm sewer other than where gutters are used. Side opening catch basins are preferable. Where grating is to be used, it shall be of "Bicycle Tire Proof" design.

4.4.8.11 All new downspouts shall drain into roof drain leaders connected to the new stormwater management system.

4.4.8.12 Concrete curbs and gutters shall be used as appropriate to direct storm water flow from paved surfaces.

4.4.9. Utilities

4.4.9.1. General: All utilities, including electrical service, telephone and cable TV, shall be installed underground. New underground utility lines, including appurtenant structures such as valve boxes, manholes, vaults, etc., shall not be located under pavement, road shoulders, or drainage ditches to the maximum extent practicable. All primary and secondary, underground service feeder shall be in concrete encased duct bank, and where it passes under traffic areas, the concrete duct shall be steel reinforced. It is the Contractor's responsibility to design and construct new utility services to provide electricity, gas, water supply, including the fire protection requirements, and sanitary sewage for the new building. The Contractor obtains all necessary connection permits for all required utilities. The contractor shall make the taps into the existing water, sanitary sewer, natural gas, and electrical service. The Contractor shall excavate to expose the line, furnish all materials required to make the tap and backfill the line. The Contractor shall notify the Contracting Officers Representative (COR) before a utility tie-in is required. The notification shall be a minimum of 30 days prior to the date that tapping the line is required.

4.4.9.2. Continuity of Service: Contractor shall supply detailed plans for, obtain comments on, and incorporate such comments on any utility or service outages or connections from Contracting Officer and Hospital O&M personnel before initiating any such outages or connections.

4.4.9.3. Physical Security Design Measures: Above-ground utility owned service equipment shall be located above the 100-year floodplain, above grade, and within a mission critical building envelope, when possible, or be protected by limited-access masonry enclosures and be located a minimum of 50 feet (15 m) in all directions from high-risk areas. Coordinate with the serving utility.

4.4.9.4. Existing Utilities: Government supplied surveys related to the location of existing utilities may not represent actual installed conditions. The Contractor shall verify actual locations of all placed utilities and shall coordinate with the Government regarding any future planned utility installations that affect the work. Coordination of all site work on the project, including utility work, is the responsibility of the Contractor. Damage caused to existing utilities is the Contractor's responsibility. It is the Contractor's responsibility to confirm the specific locations of the existing utilities and to design and construct new utility services for the new building.

4.4.9.5. Temporary Utilities: Temporary utilities must be metered with approved remote readable meters. Contractor shall provide all manpower and equipment required for tie-ins. Contractor shall perform the final electrical connection.

4.4.9.6. Device Location: New utility lines shall not be located within five feet of the footprint of any building. Post indicator valves, transformers, electric switches, telephone/cable boxes, manholes, backflow prevention valves, etc. as required, shall be located in locations not immediately apparent to the facility users or personnel passing by the site.

4.4.9.7. Marking of Utility Lines: Utility lines shall be marked with plastic marking tape and metallic tracer wire. Water and sewer marking tape shall be approved by City of Tampa Utilities. For other utilities, the tape shall be manufactured with integral wires, foil backing or other means to enable detection by a metal detector when the tape is buried up to 4 ft. deep. The tape shall be of a type specifically manufactured for marking and locating underground utilities. The metallic core of the tape shall be encased in a protective jacket or provided with other means to protect it from corrosion. Warning tapes shall be provided and installed directly above all buried pipes or wires, at a depth of 18-inches below finished grade. Tape color shall be as specified below and shall bear a continuous printed inscription describe the specific utility.

- Red: Electric
- Orange: Telephone, telegraph, television, police, and fire communications
- Blue: Water systems
- Green: Sewer systems
- Yellow: Gas or other dangerous materials

4.4.9.8. Metering: Meters shall be provided where water, gas, and electricity are connected to Medical Center or local utility distribution lines. All direct connections to local utility providers shall be permitted through and approved by the respective provider.

4.4.9.9. The Bed Tower Addition to be constructed for this project is considered a Mission Critical Facility. Requirements of the VA Physical Security Design Manual: Mission Critical Facilities shall be incorporated into the design. Utility design and construction shall not disrupt service to the Medical Center.

4.4.10. Sanitary Sewer

4.4.10.1. Scope: The new sanitary sewer system is an extension of the existing sanitary sewer collection system. The existing sanitary sewer collection system serving the project site is owned, operated and maintained by the federal

government. The on-site sanitary sewer system consists of a collection system which feeds to sanitary lift stations. These lift stations pump to a force main which then feeds into off-site force mains owned, operated and maintained by the City of Tampa at 2545 Guy N. Verger Boulevard, Tampa FL 33605 and (813) 274-8070. The Contractor shall provide the new sanitary sewer system and connections to the existing sanitary sewer collection system in accordance with the VA Site Development Design Manual; the utility provider's requirements; the USACE, Mobile District Design Manual and Florida Department of Environmental Protection (FDEP) regulations; whichever is more stringent.

4.4.10.2. The Contractor shall design and construct the new wastewater collection utility services for the new facility. System design shall include, but not be limited to the gravity sewer layout, lift station design, and all related appurtenances.

4.4.10.3. Permitting: Contractor is responsible for all permit applications, compliance, and fees required with all regulatory authorities. Government shall receive copies of all applications and correspondence. Compliance is a requirement of the Contractor. The City of Tampa Wastewater Department provides sewer service to the Medical Center. The Contractor shall obtain sewer commitment and construction plan approval from City of Tampa prior to commencement of construction. The Contractor should note that permit issuance has been delayed recently due to the high volume of permit applications. The Contractor shall meet with City staff as soon as possible upon issuance of the contract to discuss permit requirements and timeframes. City of Tampa has recently been taking two to three months from date of application to issue commitment. Construction plan review is expected to take an additional two to three months upon receipt of commitment. The Contractor shall be aware of these time frames and work together with the Contracting Officers Representative to avoid construction delays. FDEP applications should be submitted along with construction plans for City review and sign-off (as utility provider). FDEP applications will then need to be submitted separately for processing. FDEP wastewater permitting shall be through the Hillsborough County Environmental Protection Commission.

4.4.10.4. Design: The wastewater collection and conveyance system shall be designed in accordance with the USACE, Mobile District Design Manual, and the City of Tampa Technical Standards Guideline for Construction of Wastewater Facilities, current edition (downloadable at http://www.tampagov.net/sites/default/files/wastewater/files/TECHNICAL_STANDARDS_GUIDELINE_FOR_CONSTRUCTION_OF_WASTEWATER_FACILITIES_JULY_2014_VERSION_6.PDF). In addition, the designer shall comply with state and local regulations that apply, such as Chapter 62-600 of the Florida Administrative Code, Domestic Wastewater Facilities. The wastewater conveyance system shall comply with all the above requirements and shall be compatible with the wastewater to be conveyed. The materials specified shall withstand the effects of the wastewater and not deteriorate as a result of pollutants in the wastewater.

4.4.10.5. Wastewater Piping: Sanitary Sewer piping shall be polyvinyl chloride (PVC). Lines shall be tested for leakage by low pressure air testing, infiltration tests or exfiltration tests. The minimum size sewer laterals shall be 6-inch and the minimum slope of the 6-inch line shall be 0.6%. The minimum size sewer line between manholes shall be 8-inch and the minimum slope of the 8-inch line shall be 0.4%. New sanitary sewer lines shall be laid on adequate slopes in order to obtain the proper cleansing velocities, and connected to existing sanitary sewer main.

4.4.10.6. Cleanouts: Provide cleanouts at all building entrances. Cleanouts not set in a surface setting of concrete, such as a sidewalk or parking area, shall have a minimum 18-inch square of concrete to protect the cleanout plug and to match the existing grade. Depth of the 18-inch square concrete cleanout pad shall be at least 12-inches with the top set at grade. Cleanouts shall be installed on all sewer service laterals at intervals not to exceed 75 feet and at all changes in direction and/or grade. The 75 feet length includes the vertical developed length of the cleanout pipe.

4.4.10.7. Sanitary Sewer Manholes. Sanitary Sewer Manholes shall be provided at junctions of 8-inch minimum diameter gravity sewer lines, and at each change in pipe direction, size or slope of an 8-inch minimum gravity sewer line. Manholes shall be pre-cast reinforced concrete manholes sections. Manholes should normally not be located in the roadways or parking lots, but in areas that are readily accessible for operations and maintenance purposes. A steel ladder, or precast manhole steps, shall be provided where the depth of a manhole exceeds 4-feet. These manhole steps shall be spaced at 15 inches on centers. Manhole covers shall match those currently in use at the Medical Center in all essential details. Tops of frames and covers shall be set flush with finished grade in paved areas or 2-inches higher than finished grade in unpaved areas. Frames and covers shall meet anticipated vehicle loadings.

4.4.10.8. Point of connection to the existing sanitary sewer collection system shall be determined by the Contractor's Civil Engineer of Record. In identifying a suitable point of connection, evaluate the capacity of the existing collection system.

4.4.10.9. A duplex submersible wastewater pump station will be required for the Bed Tower Addition per the 2008 VA Tampa Site Infrastructure Utility Report. This pump station will be located in the service yard of the Bed Tower Addition. A new force main shall be constructed form the new pump station to the existing wastewater force main which runs from west to east along the drive to the south of the existing Diamond parking lot. The Contractor shall ensure that the new pump station is designed in such a manner as to not detrimentally impact the operation of the existing pump stations on the campus. Contractor should note that the previous Site Infrastructure Utility Report recommended that the pumps and/or impellers of the existing pump stations may be required to be upgraded to account for additional flow from the new pump station. It is intended that the contractor should design the new pump station in such a manner that these improvements are not required. If contractor is unable to, or chooses not to design the new pump station to avoid these impacts, then upgrades to the existing pump stations are to be included in the Contractor's bid. Pump curves for the existing lift stations shall be included in **Appendix P** to the RFP.

- Provide pump station wet well of precast concrete or fiberglass construction. Provide adjacent valve vault of precast concrete construction. Wet well shall be designed to prevent floatation of the wet well.
- Provide automatic control to start and stop the pump system. Provide automatic level control by floats in accordance with the preferences of the system owner to fill and prevent overflow of the wet well. Provide an emergency pump connection.
- Provide a telemetering system and recording equipment to a location manned 24 hours a day for the transmission and recording of pump operation. Transmit alarms to a location manned 24 hours a day.
- Provide connection to Medical Center emergency power sized to start up and maintain the total rated running capacity of the station, including the pumps, controls, lighting, ventilation and other auxiliary equipment.
- A bio venting system shall be provided for odor control.

4.4.11. Water Supply

4.4.11.1. Scope: The Contractor shall design and construct the new water supply for the Bed Tower. The design of the water distribution mains and service lines shall provide an adequate quantity of water at sufficient pressure for domestic and fire suppression use. Refer to Fire Protection section for other specific requirements. Contractor shall coordinate between the utility and medical and equipment designers. Additional demand created by the Bed Tower may require upsizing of the existing meter along Bruce B Downs Boulevard. Contractor is advised that the Bed Tower footprint overlaps a portion of the existing Medical Center water distribution system. The Contractor shall schedule construction activities so that water and fire supply is not disrupted.

4.4.11.2. Demolition of Existing System: The Contractor shall remove portions of the existing looped water system which will be within the footprint of the proposed building. The Contractor shall note that the proposed footprint will cover a portion of the main water loop supplying the hospital. This loop shall be maintained throughout construction. In order to do so, the Contractor shall construct a new route for the disrupted portion of the looped water supply and phase construction so that the newly constructed portion of this loop is in service before the water main to be demolished is taken off line. The Contractor must maintain the integrity of the looped water supply throughout construction.

4.4.11.3. Emergency Water Connections: Emergency water connections are required for this facility. Emergency water supply for the overall campus is provided through a water tower and well which are connected to the looped water supply. Contractor shall provide the new building with a connection to the looped water supply in order to provide emergency water connections to the new building.

4.4.11.4. Design: The water supply utility service, mains, and appurtenances shall be designed and installed in accordance with the USACE, Mobile District Design Manual, the VA Site Development Design Manual; the City of Tampa Water Department Technical Manual; Florida Department of Environmental Protection (FDEP) regulations, Ten-State Standards, applicable AWWA standards and manufacturer's recommended procedures, state and local regulations that apply, such as Chapter 62-555 of the Florida Administrative Code, Permitting

and Construction of Public Water Systems. Additionally, fire protection shall be designed and installed in accordance with NFPA 24 Private Fire Service Mains and Their Appurtenances. Design shall minimize pipeline dead ends or areas where stagnant water could develop. The new water distribution line shall be an extension of the existing building service.

4.4.11.5. Contractor shall review the provided water quality report Refer to **Appendix O.** [MOST RECENT WATER QUALITY REPORT TO BE PROVIDED BY JAHVAMC AND INCORPORATED INTO THIS DOCUMENT AT 100% REVIEW] to determine if a water de-alkalizing system or reverse osmosis for the facility is required for water treatment. Such a system, if required, shall be included in the Contractor's bid.

4.4.11.6. The new water system is an extension of the existing water system. Off-site portions of the existing water system serving the project site are owned, operated and maintained by the City of Tampa at 306 E. Jackson St., 5E, Tampa FL 33602 and (813) 274-8121. Any modifications or additions to the portion of the off-site water distribution system shall meet the requirements of the City of Tampa.

4.4.11.7. Notify the utility provider of the additional demand generated by the proposed facility. Provide a copy of all correspondence with the utility provider to the Government's Civil/Mechanical Reviewer.

4.4.11.8. Point of connection to the existing water distribution system shall be determined by the Contractor's Civil Engineer of Record.

4.4.11.9. Permitting: Contractor is responsible for all permit applications, compliance, and fees required with all regulatory authorities. Government shall receive copies of all applications and correspondence. Compliance is a requirement of the Contractor. The City of Tampa Water Department provides water service to the Medical Center. The Contractor shall obtain water commitment and construction plan approval from City of Tampa prior to commencement of construction. The Contractor should note that permit issuance has been delayed recently due to the high volume of permit applications. The Contractor shall meet with City staff as soon as possible upon issuance of the contract to discuss permit requirements and timeframes. City of Tampa has recently been taking two to three months from date of application to issue commitment. Construction plan review is expected to take an additional two to three months upon receipt of commitment. The Contractor shall be aware of these time frames and work together with the Contracting Officers Representative to avoid construction delays. The City of Tampa Water Department has stated that the Contractor will need to provide fixture counts for the overall Medical Center as part of the permit application. This should include all existing and new fixtures. System curves and cut sheets for all existing and proposed booster and fire pumps must be submitted with the application. Utility Service Application for Multi-Family / Non-Residential Developments shall be completed and uploaded to the City's Accela online permit system (https://aca.tampagov.net/citizenaccess/). It is important that all information, including fire and booster pump information for the entire Medical Center, is uploaded at time of original submittal. City staff will review the submitted information and request additional information through the online system if

necessary. Once all information is received, separate service commitments will be issued for both water and sewer. Once the water commitment is issued and the meter size is determined, a commitment fee must be paid. This fee will be substantial, but had been applied to future utility bills during the last major water project related to the Polytrauma Addition. Construction plan review will commence once an arrangement is made for fee payment. Construction plan review will be limited to improvements up to the meter/backflow. FDEP applications should be submitted along with construction plans for City review and sign-off (as utility provider). FDEP applications will then need to be submitted separately for processing. FDEP water permitting shall be through the Hillsborough County Health Department.

4.4.11.10. As part of the VA's "Mission Critical Facility" requirements, a minimum of 4 days of potable water storage is required to be provided in case of an emergency where off-site utilities are unavailable. The Physical Security Design Manual additionally requires water storage for fire fighting during such an outage. [TO BE UPDATED UPON RECIEPT OF WELL TESTING FROM VAMC TAMPA]

4.4.11.11. Piping: Thrust restraint shall be provided for all pressurized water lines 3 inches in diameter and greater. Piping for water service and distribution lines shall be polyvinyl chloride (PVC) except where use dictates otherwise. All water piping 4 inches in diameter and greater shall be push-on joint PVC. Piping less than 4 inches in diameter shall be solvent-weld PVC. Any piping which will be owned by the City of Tampa, which consists of the off-site water mains up to the meter/backflow assembly, shall be constructed of ductile iron piping (DIP). New ductile iron piping shall be polywrapped per City of Tampa requirements If corrosive soils are encountered, Contractor shall provide Contracting Officer with written documentation from City of Tampa Water confirming whether DIP shall be used for City owned piping, or whether PVC shall be substituted.

4.4.11.12. Meters: Design the new water system so that water consumption is measured at a minimum, by one meter for each facility. Ensure the meter is easily accessible, but not obvious. The Medical Center requires intelligent metering on all buildings 50,000 square feet and larger. Water meters shall be a remote reading type compatible with existing Medical Center metering. Water meters shall be purchased from the City of Tampa. The Contractor shall purchase and install all meters.
Additional information detailing the make and model of existing meters has been requested from JAHVAMC. Once received, this information will be incorporated herein to assist the contractor in supplying compatible meters.

4.4.11.13. Backflow Preventer: Water service lines are extensions of existing service. Contractor shall verify that backflow preventers are sufficient size to accommodate additional service. Contractor shall provide backflow preventers as required by and the AWWA Manual M14, Recommended Practice for Backflow Prevention and Cross-Connection Control. Contractor shall provide a test header to enable forward flow test IAW UFC 3-600-01.

4.4.11.14. Fire Protection System: Contractor shall verify that existing fire mains shall be designed to supply the quantity of water at sufficient pressures for the fire protection system required by the FIRE PROTECTION section of this document. Refer to **Appendix N** for fire flow test data. Fire water system elements provided by the Contractor include, but are not limited to all pipe, fire hydrants, fire department connections, valves and post indicator valves.

4.4.11.15. Valves: Curb stops or valves shall be installed near the point of connection to the main and on both the inlet and outlet sides of the water meter and backflow preventer. All service stops and valves shall be provided with service boxes. Valve connections shall be as required for the piping in which they are installed. Flanges shall not be buried. All valves shall be resilient-seat gate valves or approved equal.

4.4.11.16. Post Indicator Valves: Post indicator valves shall be unsupervised and secured with a frangible padlock provided by the fire department.

4.4.11.17. A fire pump will be provided to deliver adequate water supply to fire sprinklers. Flow tests provided by VAMC Tampa indicate that Hydrant #11, located at the E Entrance, has a nozzle size of 2.5, a pitot pressure of 35, a discharge coefficient of 0.9, a predicted gpm of 800, a measured gpm of 995, a static psi of 55, and a residual psi of 37. Contractor shall obtain updated flow tests for use in design.

4.5 Specific Landscape Architecture Planning & Design Criteria

4.5.1. General Planning Criteria – Refer to Section 4.1 above.

4.5.2. Building/Structure(s)

4.5.2.1 In addition to all applicable VA design requirements, the A/E shall design the site to meet the local building codes and zoning requirements where applicable.

1. Refer to **Appendix D** for applicable VA Physical Security Manual Requirements.
2. Facility location shall work with the site's natural topography and otherwise minimize impact on existing features and site drainage.
3. Preserve and maintain to the greatest extent possible, natural drainage areas and existing drainage paths to avoid the additional cost of site work to reestablish drainage patterns.
4. Facility location shall improve and enhance linkages and connections to surrounding destinations and neighborhoods.
5. Design of setback space can enhance security and safety of employees and better integrate the building into the community.

4.5.2.2 Provide building orientation will take advantage of significant view for visitors and patients, and provide important day lighting for employees and patients inside the building.

1. Building orientation and design should mitigate solar gain to the greatest extent possible. Noted in Section 5 below, required clinical planning adjacencies and connections back to the existing Building 1 take the highest priority.

4.5.2.3 The site design shall include exterior spaces that provide healing environments for patients and visitors. Spaces such as dining patios, recreation areas, and/or healing gardens shall be included near the building.

1. Exterior spaces shall encourage social interaction, but also provide some outdoor spaces that allow quiet reflection.
2. Refer to **Appendix F**, drawing **A-001A NEW SITE AND BUILDABLE AREA PLAN.**
3. Incorporate **Appendix D** for spacing requirements and location of drives, drop-offs, and parking and other buildings in relation to proposed building

4.5.3. Vehicle Circulation

4.5.3.1 Provide safe and efficient movement of vehicles and pedestrians.

- VA Physical Security Manual shall be followed with respect to distances between paved roads, parking, and structures.
- Public Access
  a) Any improvements made to VA roadways entering public right of ways shall be coordinated and approved by the local jurisdiction.
  b) VA roadways shall be conducive with surrounding properties and their respective driveways.

4.5.3.2 Site Access and Circulation

- Circulation for visitors shall be separated from service deliveries.
- Clarity for the patient as to the front entrance and location of parking shall drive design decisions.
- Site entrances project an image of the VA, therefore they shall receive the highest level of treatment and shall accommodate pedestrians as well as vehicles.

4.5.3.3 Main Entry Drop-off at New Bed Tower

- Drop-off shall be designed and provided at the main entrance to the NBT.
- Drop-off shall consist of three (3) lanes to include a curbless, accessible drop off lane where cars can pull off and park along, and still allow sufficient room for vehicles to pass through the drop-off area in two (2) adjacent lanes.
- Sufficient queuing space shall be provided to accommodate several vehicles waiting to drop-off patients.
- The drop-off lane shall be covered by a permanent canopy for the convenience of visitors and patients in inclement weather.
- The drop-off shall comply with AT/FP restrictions noted in **Appendix D**

4.5.3.4 Emergency Department Access

- Site access to entry ramp to the Emergency Department walk-in entrance shall not be impacted by the design or construction of the NBT.
- Site access to the Emergency Department ambulance drop-off shall not be impacted by the design or construction of the NBT. Construction in this site area will need to be phased to allow ambulances to deliver patients to the ED at all times during construction.

4.5.4. Parking Lot Layout

4.5.4.1 Parking Lot Locations

- Parking shall occur in lots with a limited number of entrances and exits onto the access road or drive.
- The project only provides for patient and visitor parking. No employee parking is required.

4.5.4.2 Number and Types of Parking Stalls

The minimum amount of parking stalls required ___ common stalls and ___ accessible stalls and is indicated **Appendix F**, drawing **A-001A NEW SITE AND BUILDABLE AREA PLAN.**

- Allotment of a very limited amount stalls for Low-Emission vehicles, Carpool vehicles, or any other designation shall be designated and reserved to meet LEED Silver Equivalent requirements, if this is a Medical Center priority.
- Consult the VA Parking Design Guide for appropriate dimensions and details regarding parking design.

4.5.4.3 Accessible Parking Spaces: Accessible spaces shall be planned to be as close to the building entrance as possible. Unless absolutely necessary, visitors utilizing accessible spaces should not be required to cross a drive lane to reach the building entrance.

- Accessible parking shall be designed according to the ADA/ABA and the VA Parking Design Guide and the Barrier Free Design Guide.

4.5.4.4 General Parking Lot Design

- Do not design parking lots with dead-end parking areas.
- Due to heat island effect and LEED, concrete is preferred over asphalt unless otherwise directed by the VA.
- 8'-wide (minimum) islands are required at the ends of parking aisles
- Islands that contain a pedestrian walkway shall be sized large enough to have both the walkway and 8'-0" of pervious surface within the island.
- Parking aisles where there are more than 15 continuous parking stalls should consider an intermediate island to lessen heat island effect and promote a more pleasing environment. Intermediate islands shall be a minimum of 8'-0" wide.
- Pavement Design
- Sustainability Porous pavements are allowed to be utilized only in parking stall spaces and not drive aisles.

4.5.5. Pedestrian Walkway and Circulation

4.5.5.1 Walkway Network and Connectivity

- Walkways (Sidewalks) shall be logically connected and designed to provide clear, unobstructed routes through the site.
- Sidewalks can be classified into a hierarchy that will dictate design requirements and provide guidance on their function and treatment

4.5.5.2 Walkway Configurations

- Sidewalks shall be configured to provide convenient access to building entrances and facilities. In most cases, the grid walkway system provided the most direct access between locations.

- For outdoor spaces, dining patios, or healing garden spaces, a more relaxed curvilinear or organic system should be employed to encourage visitors and patients to engage with the natural elements in the surrounding landscape.

4.5.5.3 Walkway Design Requirements
- Walks shall be at least 6'-6" wide and at least 8'-6" wide where walks abut parking stalls.
- All walks shall be designed to accommodate people with mobility issues.
- Sidewalks shall be constructed of concrete.

4.5.5.4 Curb Ramps
- Curb ramps shall be provided at all intersections as well as where walkway routes cross a roadway.
- Provide tactile warning devices at curbs, ramps, etc.
- Curb ramp design shall be coordinated with the VA Barrier Free Design Guide.
- Designate crosswalks for safe street crossings where there is pedestrian traffic and a curb ramp location.

4.5.5.5 Ramps and Steps
- Minimize the use of stairs along walkways.
- Ramps and steps shall be designed per the ADA/ABA and the VA Barrier Free Design Guide.

4.5.6. Site Grading

4.5.8.1 Grades at Buildings
- Earthwork adjacent to the building shall be at least 6" below finished floor.
- Earthwork grades shall not slope or fall toward the building.
- Coordinate surface grading with architectural, structural, and mechanical design to provide proper surface drainage.

4.5.8.2 Turf Grades
- Grass ditches or swales shall be sloped at a minimum 2% slope.
- Turf areas shall be sloped at a minimum of 2% and a maximum of 25%.

4.5.8.3 Pavement Grades
- A/E shall reference the VA Site Development Design Manual, Table 4-1 for recommended, minimum, and maximum pavement grades dependent on material and application.
- Design shall fall within the recommended limits unless otherwise approved by the VA.

4.5.7. Landscape and Irrigation Design

4.5.7.1 Landscape Design

The landscape design shall support, accommodate, and respect the medical mission and function of the facility. Landscapes shall be designed to be accessible and safe for patients, have seasonal interest, and provide areas of respite.

4.5.7.2 Sustainability
- VA is required to implement sustainable practices.

- Refer to VA Sustainability and Energy Reduction Manual for instructions that apply to landscaping and site development.
- Use appropriate, non-invasive plants that are appropriate for site conditions, climate, and design intent.
- Where practicable, use vegetation native to the Eco region.
- Use vegetation to minimize building heating/cooling requirements.
- Use vegetation to promote patient/employee morale and well-being activities.
- Increase user ability to understand and safely access outdoor spaces.
- Encourage outdoor activities.
- Create quiet outdoor spaces for relaxation, restoration, small group interaction, and views.
- Create appealing views from the indoor environment onto the outdoor environment.

4.5.7.3 Landscape Design Guidelines

- Use hardy, regionally native or naturalized plant materials whenever possible.
- Maximize low maintenance landscapes and still present an appealing image to patients and visitors.
- Maximize the use of water-efficient plant material.
- Ensure landscape design complies with AT/FP design guidelines.
- Design plant material that is appropriate for the location and design intent.
- Do not plant trees/palms in close proximity to enclosed occupied building structures where the mature foliage could come into contact with these types of structures.

4.5.7.4 Parking Lot Design

- Trees shall be planted in all islands, both intermediate and end islands. Ensure island is large enough to accommodate mature tree growth. A total width of 10'-0", with 5'-0" clear on either side of the trunk should be sufficient.
- Grass shall not be planted in parking medians, both end and intermediate islands.
- Utilize shrubs, groundcover and mulches to landscape parking lot islands.
- Do not allow shrubs or trees to negatively impact sight lines for vehicles using the parking lot. Planting within site lines should be a maximum height of 24" at mature growth.
- Provide adequate clearance at parking stalls bordering an island/median so that pedestrians can exit vehicles without impacting landscape material.
- Provide adequate clearance at the end of parking stalls so vehicles when using the stall do not damage landscape material.

4.5.7.5 Tree Selection Criteria

- Do not select trees that have messy fruit or berries, produce sap, are brittle-limbed, susceptible to insects or disease, or are deciduous and

large-leafed trees. Provide a minimum of tree per 1000 sq ft of open space.

- Do select trees that are long-lived, provide medium to dense shade in the summer, can thrive in direct and indirect heat of urban environment, are resistant to insects and disease, and which require little pruning.

4.5.7.6 Plant Zones

The landscape design shall encompass several plant zones that will impact the amount and diversity of landscape material to be used.

- The area closest to the NBT, and to include the main site entrance, shall receive the most relatively intense level of planting design. Landscape material should be diverse, multi-layered in size, shape, and type and should consist of trees, shrubs, groundcovers, annuals and perennials. Provide 10 shrubs per 100 sq ft of landscaped areas.
- Irrigation shall be employed in this area to ensure a healthy landscape. All landscape areas should be drop irrigation, and spray heads for all turf area. Add quick coupler throughout this zone to aid in maintenance.
- The intermediate zone, particularly the parking lot areas in closer proximity to the NBT, shall still receive a diverse range of plant material, but in quantities and density that is less than that used around the building.
- Limited irrigation should be available to supplement natural conditions/rainfall to prevent catastrophic damage during prolonged periods of drought or high temperatures. Provide a minimum of 6 shrubs per 100 sq ft of landscape area.
- The outer zone will receive the least amount of landscape material, both in diversity and quantity. Provide a minimum of 3 shrubs per 100 sq ft of landscaped area.
- Plants in the outer zone should be selected for their extremely low-water requirements. Irrigation is not to be used in this zone.

4.5.7.7 Healing Gardens

- The design of a healing garden is strongly recommended to serve patients and visitors to the NBT.
- Reference the VA Site Development Design Manual, Section 8.4.1 for additional information regarding design and function.

4.5.7.8 ATFP and Site Security Finish Features

- SECURITY BOLLARDS – "DECORATIVE OUTER CASTINGS covers" will be added to the VA TIL STANDARD SPEC – 34 71 13 and will be defined aesthetically by the Contractor's Landscape Architect or Architect. DECORATIVE OUTER CASTING covers shall not have flat surfaces on the top surface, but be sloped to prevent objects, water, etc. from collecting on them. The finished top foundation for the SECURITY BOLLARDS specified via 34 71 13 shall not appear above any finished grade level in soft-scape or hardscape areas.
- Planting design must closely coordinate with security.
- Whenever possible, utilize landscape design and plant material to create effective screens and/or otherwise remove the necessity for walls,

bollards, etc. that detracts from the positive image the VA wants to project to visitors and patients.

4.5.8. Irrigation Design

4.5.8.1 Efficient Systems

- Federal Mandates for Sustainability require this facility to reduce outdoor potable water usage by 50% over conventional requirements.
- Irrigation design shall incorporate high-efficiency fixtures and strategies to reduce overall water consumption.

4.5.8.2 Water Sources for Irrigation

- Potable water shall be used for irrigation in all areas due to risk of illness or infection. Where specifically allowed by the VA and only where patients are extremely unlikely to access, non-potable water sources may be considered an acceptable water source. The following outlines the types of information typically addressed. Provide subheadings and information applicable to the project:
  a) Facility footprint
  b)

4.5.9. Site Furnishings

4.5.9.1 Furnishings

- Site furnishings shall be selected and sited to support the function of the walkway.
- Group furnishings together rather than scattered to consolidate space required.
- Locate furnishings adjacent to, rather than on walkways in a manner that does not impede pedestrian traffic.
- Furnishings shall accommodate the mobility impaired to include space adjacent to walkways for seating for wheelchairs.
- Furnishings should be consistent across use, simple and straightforward and reflect the architectural character of the facility.
- Site furnishings shall be durable and low maintenance.

4.5.9.2 Exterior Signage Requirements

- Exterior Signage around the project site area that can be salvaged and relocated and reused, with minimal modification is indicated in Appendix W. New exterior signs required by the VA Signage Design Guide dated December 2012 shall be designed, provided and installed in accordance with this document's requirements.

5 ARCHITECTURE

5.1 Architectural Objective:

The primary and highest priority planning driver for the NBT shall be the planning of the bed unit floors, that support life cycle cost effective layout and lean planning principles for ICU beds and Med-Surg beds.

Additionally, via the physical building design, that Contractor shall minimize the project's life-cycle cost, energy consumption, and maintenance though the proper selection of engineering

systems and the selection of industry standard materials and systems for building construction integration. The design execution of building mass, forms, spaces, while still important, will play a lesser degree in defining the NBT project. The Government shall have final approval authority for the final overall design integration of finish materials, colors and textures.

5.2 Architectural Design & Planning Criteria:

5.2.1 Refer to Section 2 DESIGN REQUIREMENTS for all codes and references.

5.2.2 Life safety plans shall be provided as described on Section 01 10 12.

5.2.3 Accessibly compliance shall be in accordance with the VA specific standards referenced on the VA TIL PG-18-13 Barrier Free Design Guide, which in some cases are more stringent and different than Federal standards contained in the Architectural Barriers Act (ABA) and Americans with Disabilities Act (ADA).

5.2.4 For Architectural Sustainability criteria refer to 01 10 10, Section 20.

5.2.5 For Building Commissioning criteria refer to 01 10 10, Section 21.

5.2.6 Prohibited Items. The following items are prohibited:

- o Asbestos and asbestos containing products shall not be used
- o Floor stops for doors
- o Pre-engineered metal building systems
- o Exterior Insulated Finish Systems (EIFS) exterior envelope enclosures
- o Wood or vinyl siding exterior envelope finishes
- o Wood exterior doors
- o Loose ballast roof systems
- o Exposed fastener metal roof systems
- o PVC membrane roofing systems
- o Exterior protective shutters for hurricane protection.
- o Glass masonry unit blocks either for interior or exterior use.

5.2.7 Architectural Exterior Character:

The NBT addition and associated structures shall be contextual architectural responses to the existing campus buildings at JAHVH, in accordance with Design Aleart147 noted in section 2.2.4.2 above. The NBT shall present a strong presence to the community and, with an architectural character of mass, form, material, siting and entry approach similar to the recently completed Building 38 project on the west side of the VAMC Tampa campus.

The Interior Design Character is referenced in Section 01 10 10, Structural Interior Design, Signage and FF&E Requirements.

5.2.8 Functional Spaces:

Refer to **Appendix E**, the Program for Design that contains the project's primary space

requirements for the intended regularly occupied spaces of the new Bed Tower Addition, follows this page. The tracking of gross and net floor areas shall be performed in strict accordance with the requirements defined in the VA TIL document Program Guide 18-15, Volume B governing requirements for VA Major Project design. The total Gross Square Feet (GSF of the building) shall not be smaller that that that indicated in the Program for Design.

Refer to **Appendix E** for specific typical Room Guideplates that defined the detailed generic room requirements for typical spaces indicated in the Program for Design. Additional room requirements are defined in **Appendix E**. These templates are guides and not wholly prescriptive. The Room Guidplates are generic in nature and the dimensional proportions of rooms as developed into a cohesive and integrated space plan may contain minor variations in the final planning. Clarifications of minor layout deviations of fixed fixtures and equipment from the templates shall occur during the Design After Award stage.

5.2.9 Bed-Unit Floor Design Requirements

All patient units and patient rooms shall comply with the requirements provided in the VA Technical Information Library (TIL) (www.cfm.va.gov/til) including, but not limited to, the following:

VA PG-18-9 Chapter 100: Medical / Surgical Inpatient Units
VA PG-18-9 Chapter 102: Intensive Care Nursing Units
VA PG-18-12 Medical / Surgical Inpatient Units & Intensive Care Nursing Units
VA PG-18-4: Room Finishes, Door, and Hardware Schedules

5.2.9.1 Medical / Surgical and Intensive Care Patient Units

- Maximize the amount of daylight entering the unit and views to the outside.
- Meet or exceed minimum VA noise criteria.
- Provide separate "on-stage, off-stage" circulation paths within the patient unit. Separate public entry points to the units from patient and service access.
- Decentralize nurse stations to provide maximum visibility to patient rooms and to reduce nurse travel distances.
- Locate nurse stations at unit access points to provide control of visitor and other traffic entering the unit.
- Design nurse stations with an open concept to minimize walls and other barriers in order to help increase visibility to other areas of the patient unit and to provide easy access to staff for patients and family members. Consideration should be given to the impact of noise levels at the nursing station as they affect other parts of the patient unit. Maintain VA required noise level and HIPAA requirements.
- Decentralize support spaces such as clean and soiled utility rooms, equipment storage, medication rooms, etc. and locate these rooms near the nurse stations.
- Locate staff administration areas close to the unit but removed from the patient rooms to reduce noise on the patient unit and to provide a respite for staff.
- Locate crash cart alcoves in close proximity to patient rooms and not within the nurse stations.
- Locate family consultation rooms adjacent to the waiting / lounge.
- Locate Medical Gas Storage for unused and used tanks equal distance from all patient rooms.

- Locate storage areas equal distance to secured supply and medication stations from each patient room. Each storage area must have controlled access.
- Each hallway should be wide enough to allow the safe transportation of patients in bariatric beds and ICU beds with accompanying medical equipment (ventilator, IV pumps, etc.) and the free flow of interdisciplinary teams (at least 12 members with 3 Mobile Computers) during patient rounds.
- The nurse-call system should support current wireless technology allowing for seamless alerts to the staff and communication with patients. The system must interface with monitoring technology and patient communication systems.
- Locate ICU units on the same floor and adjacent to each other to maximize the following efficiencies:
- Patient care support during emergencies; internal within the units and while responding to emergencies throughout the hospital to support magnetic resonance therapy (MRT) and code blue calls
- Staffing efficiencies
- Equipment sharing
- Critical care specific education
- Supplies / logistics management
- ICU Inpatient Unit shared shower facilities shall be centrally located away from direct patient room view but in an area where staff can safely transport the patient while continuing to monitor the status of other critical care patients in the patient unit.

5.2.9.2 Patient Rooms – General Requirements

- Exposure to natural light and views to nature have a positive effect on patient outcomes. Benefits include faster recovery, less anxiety and stress, decreased dependency on pain medications, less patient agitation, and decrease in patient length of stay. Staff benefits include less stress and less staff absenteeism. Each patient room in every unit must have at least one picture window with sizeable view to the outdoors with light reduction capability that does not require shades, curtains or any other external component. These windows must allow sufficient natural light in the room to maximize human sleep–wake cycle. Sun control must be provided where needed. The project's sun control systems are defined in Section 7.3 below and in **Appendix V.**
- Reduced noise levels in patient rooms provide better patient outcomes by reducing the number of sleep disturbances which reduces patient stress and patient length of stay. Meet or exceed minimum VA noise criteria.
- All patient bedrooms and bathrooms shall provide a base level of bariatric patient accommodation. Features include:
- All grab bars in the Patient Bedroom and Patient Toilet / Shower shall be rated to support a concentrated load of 400 lbs.
- Ceiling mounted patient lift rated for 500 pound capacity with ability to transport the patient to the bathroom.
- Provide wall-mounted sinks rated at 400 pound capacity.

- Provide floor-mounted toilets (all with ADA compliant 19" high seats) in Patient Toilet / Shower to accommodate a drop weight capacity of 700 pounds (impact factor of 1.4 for a 500lb patient) in order to service a wider variety of patient needs.
- Provide adequate space at the Patient Toilet / Shower fixtures to accommodate staff assistance.
- Provide wall protection in the Patient Bedroom to prevent wall damage from specialized bariatric equipment.
- All patient rooms shall be designed to meet or exceed accessibility standards as outlined in the Architectural Barriers Act Accessibility Standard (ABAAS) and the PG-18-3 Barrier Free Design Standard.
- A "smart" TV shall be provided at the patient footwall with the ability to adjust to the individual patient's line of sight. This system will not only provide for patient entertainment, but shall also provide information to the patient. This information may include the posting the names and photos of caregivers, the ability for the patient to receive medical education related to their medical condition, and any other information that the Medical Center would like to include.
- Patients shall have the ability to control room lighting and operation of the TV at the patient's bedside.
- Patient rooms shall have the ability to be terminally cleaned in thirty minutes or less. Room finishes shall be selected to accomplish this objective.
- Bumpers for the patient bed shall be floor mounted to prevent wall damage at the headwall. These bumpers shall be easily cleaned and maintained.
- Each patient room must provide secured storage for supplies, linen, and patient belongings
- The Medical Center will incorporate the use Workstations on Wheels (WOWs) for patient charting at bedside. Adequate clearances for the movement of this equipment into the room, space within the room for the equipment to be located at bedside, and all required utilities must be provided.

5.2.9.3 Medical / Surgical Patient Rooms - Specific Requirements

- In addition to the General Patient Room Requirements outlined above, additional requirements specifically for the Medical / Surgical Patient Room are as follows:
- The patient bathroom shall be located at the inboard / headwall location; along the corridor side of the patient room and adjacent to the patient room headwall. Advantages of this location include a short distance from the patient bed to the bathroom, opportunity for larger windows and good patient view to the outside, adequate space for an in-room family zone, and increased patient privacy.
- Medical gasses / services shall be mounted on the headwall and services provided on both sides of the patient. It should be located a minimum of 60 inches above the finished floor. An aesthetic focal point shall be provided

on the wall at the head of the patient. The following services shall be provided:

- o O^2 - 2 outlets
- o Medical Vacuum - 2 outlets
- o Medical Air: 3 outlets
- o Electrical: 10 single outlets on headwall with cord containment system

- To reduce the potential for patient falls, provide positive drainage in shower area of the bathroom to prevent water from the shower to pool in the bathroom and to prevent water from entering the patient room. Drains shall not create a tripping hazard for ambulatory patients or prevent rolling access for patients who use wheelchairs.

5.2.9.4 Intensive Care Patient Rooms - Specific Requirements

- In addition to the Standard Patient Room Requirements outlined above, additional specific requirements for the Intensive Care Patient Room are as follows:
- The ICU patient bathroom shall be located at the inboard / footwall location; along the corridor side of the patient room and adjacent to the patient room footwall. Advantages of this location include the opportunity for larger windows and the possibility to use space at the entrance of the room for an ante-room.
- All patient rooms shall be provided with a nurse observation alcove on the corridor side of the patient room to provide direct visibility to the head of the patient bed from the corridor. Each alcove should contain windows allowing both clear views to the patient and also provide variable patient privacy. Medical gasses / services shall be mounted on the headwall and services provided on both sides of the patient. It should be located a minimum of 60 inches above the finished floor. An aesthetic focal point shall be provided on the wall at the head of the patient. The following services shall be provided:
  - O^2 - 4 outlets
  - Medical Vacuum - 6 outlets
  - Medical Air: 4 outlets

5.2.10 Medical/Surgical Patient Rooms – Radioactive Therapy Radioactive isolation

Provide rooms as indicated in the Program for Design. This specialized room type if for treatment of med / surg. inpatients who are undergoing radiative therapy shall be provided. A suite of rooms consisting of an Ante Room, Patient Bedroom, and Patient Bathroom, and similar in layout and net square footage to Isolation Patient Room (BRIT1), will be designed to accommodate the special needs of this unique type of patient. Floors, walls, and ceilings shall be provided with radiation shielding at a rating required to protect adjacent spaces and people from exposure to radiation. Windows to adjacent areas shall also be provided with radiation shielding. The amount of shielding required will vary, depending on the final configuration of the room, the level of radiation emanating from the patient, and the building construction. The services of a Physicist shall be procured to analyze and determine the final radiation shielding requirements for this area.

5.2.11 Canteen Area Specific Requirements.

The Contractor shall coordinate the planning and design of the Canteen's retail, public dining areas, public servery and back-of-house kitchen areas with the VA's in-house National Canteen Planning service and defined in detail in Section 01 10 12. The Canteen service functions shall be on the Ground Level and all other programmatic functions shall be on the First Level.

Design and planning requirements shall be as dictated in the VA TIL ProgramGuide-PG-18-9, Chapter 206, Veterans' Canteen Services guide. Refer to **Appendix E** for Space Program requirements and **Appendices U, V and W** for Equipment, Interior Design and Signage requirements respectively.

The Canteen shall contain an exterior service Ground Level access via a pair of 3'-8" wide x 9'-0" high service doors to supply the food service and retail store components. A formal loading dock with dock levelers is not required.

5.3 Exterior Envelope Construction – Walls

5.3.1 System Description

This system consists of the exterior shell of the facility, which includes all vertical and horizontal exterior closure such as exterior walls, exterior windows, exterior doors and roofing.

Structural frame elements at exterior such as columns, beams, and spandrels are included in Section 01 10 10, Section 8 Structural Design, with only the applied exterior finishes (e.g., paint, stucco) being included in this section. Finishes to the inside face of walls which are not an integral part of the wall construction will be included in 01 10 10, Section 07 Structural Interior Design.

The exterior wall system and associated opening protectives shall be designed and constructed to safely resist and transfer all imposed loads to the main load bearing systems.

1. TAS 201, Impact Test Procedures

2. TAS 202, Criteria for Testing Impact and Non Impact Resistant Building Envelope Components Using Uniform Static Air Pressure

3. TAS 203, Criteria for Testing Products Subject to Cyclic Wind Pressure Loading.

The location or application of exterior impact protective systems shall not prevent required exit egress from the building.

5.3.2 General Systems Requirements Exterior Walls

The primary exterior material of the buildings shall be one or more of the following that matches the character of the existing adjacent existing campus buildings:

- brick masonry,
- stucco (Portland cement plaster)
- Aluminum curtain wall system,

- cast-in-place concrete,
- precast concrete
- precast concrete panels with integral brick veneer finish
- manufactured composite metal
- pressure equalized terra cotta rain-screen exterior wall system composed of the exterior closure and the exterior wall back-up construction

5.3.3 Exterior Closure

Exterior walls shall provide the building with a thermally insulated, weather-resistant exterior wall envelope and include flashing at all penetrations and terminations at adjacent systems. The exterior wall envelope shall be designed and constructed to prevent the accumulation of water within the wall assembly by providing a system that of itself provides a water resistive barrier or in which any applied exterior veneer system provides for the water resistive barrier and means for draining water that enters the assembly to the exterior. Protection against the accumulation of condensation in the exterior wall assembly shall be provided.

A precast concrete with thin brick exterior wall closure may be provided. A metal prefabricated exterior wall closure may be provided. Metal panels shall have concealed fasteners.

EXTERIOR WALL BACKUP CONSTRUCTION

Provide Exterior Wall Construction System (back-up systems for wall veneer) with insulation and expansion control as described below:

Exterior bearing walls consisting of metal studs as the primary floor or roof supporting structural element are not permitted.

INSULATION & AIR BARRIERS

Provide continuous insulation (International Energy Conservations Code Climate zone 2A), vapor retarder and/or air barrier to meet or exceed requirements of project's energy savings requirements. Wall assembly shall be designed to minimize heat gain and loss from conduction, solar radiation, and air leakage. Refer to ASHRAE 90.1, 2013, for recommended "U" values for walls, glazing, roofs, and floors.

Provide a continuous air barrier to control air leakage into, or out of, conditioned spaces. The building envelope shall include all elements of the facility that are exposed to the outside environment or outside environmental conditions such as roof, walls, floors, and compartmentalized unconditioned portions of the facility such as garages, and negatively pressurized spaces. Permanently seal penetrations through the air barrier, joints in the air barrier, adjoining construction, and transitions to different air barrier materials.

Confirm air barrier compliance with Air Barrier Performance Test in Section 21 below.

PARAPETS

Provide parapets for exterior wall construction forming perimeter edge fall protection, and/or design and construct a fall arrest protection system.

EXTERIOR LOUVERS & SCREENS

Provide exterior louvers and screens, where required, detailed to integrate with the architecture of the building, as appropriate to the design of the building.

Use of storm shutters to satisfy exterior windows, louver, and/or door wind and impact resistance is prohibited

BALCONY WALLS & HANDRAILS

Intentional fall and/or jump protection: In areas accessible to the public, either at the building interior or exterior, balcony and/or walking surfaces raised $\geq$30" above adjacent floor levels shall be provided with perimeter walls &/or guards to a minimum height of 8'-0" above the finished floor or grade.

Exception: Exit egress ramps, stairs and loading docks shall be provided with code minimum required hand and guard railings.

EXTERIOR SOFFITS

Provide exterior soffit system constructed of prefinished metal, cement plaster, or any other material allowable as an exterior wall assembly

Uses of exposed or painted gypsum board and/or ferrous metal soffit materials are prohibited.

EXTERIOR PAINTING AND COATINGS

Provide field applied exterior coatings for all items that are not prefinished, and to prefinished items when required to provide a color other than a standard prefinished color. Exterior coatings need to meet the low-VOC requirements for LEED for Healthcare

EXTERIOR JOINT SEALANTS

Provide exterior application of joint sealants to seal joints and prepare for finish material installation. Exterior sealants need to meet the low-VOC requirements for LEED for Healthcare.

EXTERIOR CANOPIES OR RECESSED DOORS

Exterior doors shall be located under exterior canopies or be recessed in alcoves that provide weather protection immediately on the building exterior.

SUN CONTROL DEVICES (EXTERIOR)

Provide fixed horizontal and or vertical type. Sun control devices shall be detailed to integrate with the architectural wall system.

SCREEN WALL

Provide screen walls where required to screen mechanical units, electrical substations, loading docks, and trash receptacles. Screen walls shall be aesthetically compatible with the building architecture. Rooftop mechanical screens shall be designed to minimize roofing penetrations.

EXTERIOR WINDOWS

Windows shall be provided in each area of the building that is regularly occupied, to enhance the working environment, without compromising visual acuity and comfort. Provide windows in patient rooms to be at least 10% of the clear floor area of the room, or a minimum net glazed area of not less than 8% of the floor area. Natural day lighting is preferred Exterior windows system shall be prefinished aluminum. Windows shall meet Antiterrorism requirements.

To meet the physical security standards the design team must include a certified physical security specialist as well as a licensed professional structural engineer who has specialized training in blast design and analysis, refer to the VA Physical Security Design Manual for mission Critical Facilities for applicable guidance relative to this project.

WINDOWS

Windows shall be fixed.

CURTAIN WALLS

A curtain wall is a reinforced window wall that spans more than one story or more in height.

Provide a single story and multi-story glazed curtain wall systems.

System shall be a standard architectural type system, with mullions, horizontal rails, and or integral spandrel panels. Fully coordinate system accessories directly incorporated and adjacent to contiguous related work and insure materials compatibility, deflection limitations, thermal movements, and clearances and tolerances.

System shall be a glazed system or a combination of glazed panels and opaque panels

EXTERIOR GLAZING

Glazing shall be glass units composed primarily of vision laminated glass and tempered glass, and less quantities, spandrel glass panels.

EXTERIOR DOORS

Provide solid door assemblies other than at the main entrance and exterior door at Level 1 connecting to Canteen exterior areas. Exterior doors and frames shall be aluminum, and /or glass/

GLAZED DOORS

Glazed Doors - Provide Exterior Glazed Doors and Entrances System. including factory-finish , all glass, aluminum framed, stainless steel framed door assemblies with insulated, and/or tinted glazing, frames, and hardware and wall opening elements such as lintels, sills, through-wall flashings, and joint sealers.

OVERHEAD ROLL-UP AND OVERHEAD SECTIONAL DOORS

Design doors and opening for Provide lockable doors with

Accomplish door operation by also providing counterbalance, heavy duty springs, wear strips, full perimeter weather-stripping, continuous button pressure safety operation, electric or infrared safety edge, galvanized hardware, and manufactured trims and closures pieces. Protect the wall door jamb opening with guards designed to resist abuse from the type of material and vehicles that are transported through the opening.

Provide overhead sectional, or overhead rolling doors that conform to Commercial ANSI/DASMA requirements. Provide aluminum clad insulated door panels provide painted finish with custom colors, or anodized aluminum finish for the door and accessories to match facility color scheme. Design the overhead sectional door to withstanding the design wind loading of ASCE 7 and operate normally.

EXTERIOR DOOR HARDWARE

Provide the services of a certified door hardware consultant to prepare the door hardware schedule.

Provide hardware keying compatible with the existing hospital keying system. All cylinders shall be keyed into existing Grand Master Key System. Provide removable core cylinders that are removable only with a special key or tool without disassembly of knob or lockset. Cylinders shall be 7 pin type. Keying information shall be furnished at a later date by the Government. Refer to Section 01 10 10, Section 16 for information regarding the Physical Access Control System (PACS)

AUTOMATIC ENTRANCE DOORS

Automatic Sliding Entrance Door Controller

Automatic sliding entrance doors must be glazed aluminum doors and frames as specified in this section. Controller must be a dual function safety device that utilizes planar K-band microwave motion detectors and focused active infrared presence sensors at each door to protect individuals in the path of the sliding door. The planar K-band motion detector must be capable of sensing an individual moving as slow as 2.2 inches (55.8 mm) per foot. The focused active infrared sensors must overlap their patterns for full coverage of the motion pattern and extend its range all the way to the floor surface. The infrared sensors must constantly remain in operation even when the door is in the closing cycle. Door and frame must have a "break-away" feature that allows the door to be pushed open in an emergency exit situation.

Provide automatic sliding entrance doors at the main entrance of the NBT.

5.4 Exterior Envelope Construction – Roof

GENERAL SYSTEM DESCRIPTION

Roof systems shall be watertight and compatible with facility function, construction, and service conditions. Provide complete roof system design and construction services for the entire new facility roof system, including all ancillary and incidental work necessary for a complete, new, watertight roof system installation, including tie-in with existing systems.

PROHIBITED SYSTEMS:

Loose ballast roof systems are prohibited.

Built-in gutter systems where drainage passes through an interior space or is concealed in the exterior cavity wall shall be prohibited.

Submittal Requirements: Components of a minimum roof submittal shall include the roof plan, method of drainage, standard details and details unique to the project, wind load calculations and requirements.

Provide a Pre-Design Roofing Conference and Pre-Roofing Conference to assure roof design and construction is properly coordinated before construction begins.

ROOF COVERINGS

STEEP SLOPE ROOFING SYSTEMS
Steep slope roofing systems that are acceptable include: metal.

The roof system shall be designed and attached to resist wind uplift pressures calculated in accordance with ASCE 7. Uplift resistance shall be validated by applicable Factory Mutual (FM), Underwriters Laboratories (UL) or ASTM uplift resistance test procedures. Steel panels shall be zinc-coated steel conforming to ASTM A 653/A 653M; aluminum-zinc alloy coated steel conforming to ASTM A 792/A 792M, AZ 55coating; or aluminum-coated steel.

Sub-purlins for the Structural Metal Roof System shall be galvanized.

SSSMRS Warranty Certificate. At the completion of the project the Contractor shall furnish signed copies of the Warranty for Structural Standing Seam Metal Roof (SSSMR) System.

LOW SLOPE ROOFING SYSTEMS
Wind Uplift - The complete roof covering assembly shall be rated capable of withstanding an uplift pressure as defined by applicable code requirements.

Fire Safety - Complete roof covering assembly shall:

1. Be Class A rated (No Combustion Beyond Flame/Heat Source) in accordance with and listed as

Roofing work subject to the terms of the Article "Warranty of Construction", FAR clause 52.246-21, except extend the warranty period to five years.
Cool Roof - Meet the ASHRAE 90.1 Chapter 5 values for cool roofing.

ROOF INSULATION AND FILL
Provide roof insulation values no less than in accordance with applicable code requirements.

For fastening roof insulation on low-slope membrane roofs, fasteners shall be place to withstand and obtain an uplift pressure meeting the applicable code requirements

FLASHINGS AND TRIM
Flashing and sheet metal work shall include scuppers, splash pans, and sheet metal roofing.

Use 200 mm (8 in.) high base flashing at walls and penetrations. Do not use pitch pockets or similar penetration seals.

Flashings shall be Stainless Steel - ASTM A 167, Type 302 or 304

GUTTERS AND DOWNSPOUTS (Not Permitted)
Exterior, exposed, gutters and downspouts shall not be permitted. Concealed (interior) gutters and downspouts are prohibited.

ROOF OPENINGS AND SUPPORTS
Provide pre-manufactured insulated roof hatch and rails or guards.

OTHER ROOFING
Provide lightning protection, without penetrating the roof membrane, copings or flashing components.

Provide walkway pads using reinforced sheet not less than three feet wide. Heat weld or solvent weld walkway sheet to roof sheet at edges. Weld area two inches wide by the entire length of the walkway sheet.

Provide a safety tie-back fall protection system where parapets do not provide adequate fall protection to prevent falling off of roof edges. Design, fabricate, and install safety tie-backs anchored to the roof structure for the purpose of providing fall protection, window washing and general building maintenance including:

a. Single eye safety tiebacks at vertical face of building.
b. Signage indicating safe usage and restrictions.

c. Instructional materials.

WINDOW WASHING SYSTEM
System is for use by Owner hired, independent, window washing companies. Design to comply with OSHA standards, locating anchors such that new windows are accessible for cleaning and/or maintenance with conventionally rigged window washing equipment. Coverage shall include the following areas:

a. Access to windows and curtain wall glass which is not easily reachable by ladder from grade.
b. Including windows which are difficult to reach from above due to adjacent soffits and other projecting overhangs. Provide soffit and/or wall mounted anchors required to reach these protected areas.
d. No Anchors shall be installed in the existing Roof or existing Building faces.
e. Complete design of system with drawings and calculations sealed by a registered Engineer licensed to practice Structural Engineering in the State of Florida.

Provide new roof drains and accessories

5.5 Interior Construction

Interior construction includes interior partitions, interior doors, and fittings.

Provide durable construction appropriate for the building function. Acoustic properties of materials, as well as durability, shall be considered during material selection.

GENERAL SYSTEM REQUIREMENTS
Areas of the Project subject to abuse require that "impact Resistant" systems be provided. See "Room Requirements" for specific requirements on "Partitions", "Interior Doors", and "Fittings".

PARTITIONS
All interior partitions shall be either concrete masonry or metal studs with gypsum board each side.

FIXED PARTITIONS
Provide fixed interior partitions, except where demountable or retractable partitions are specifically required by Appendix E. Sound-rated partition assemblies shall have a minimum Sound Transmission in accordance with ASTM E 90 or ASTM E 413 for frequency data. Refer to VA TIL PG-18-3 Topic 11.

Demountable Partitions - Intentionally Not Used

INTERIOR GUARDRAILS AND SCREENS
Provide balustrades where required by code. Provide screens where required to prohibit view of a particular area.

INTERIOR WINDOWS
Provide interior windows of aluminum and/or hollow metal, fixed or operable.

GLAZED PARTITIONS & STOREFRONTS
Provide glazed storefront system.

INTERIOR GLAZING
Interior glazing shall be clear

INTERIOR DOORS

STANDARD INTERIOR DOORS
All interior doors shall be flush wood, unless noted otherwise be VA TIL document PG 18-14. For example, non-public areas Canteen Kitchen and Service areas, dedicated penthouse mechanical rooms, bed tower utility plant, shall have painted hollow metal doors.

Flush wood doors shall be WDMA I.S.1A-04, premium grade,

Building standard doors to comply with WDMA I.S.1A Premium Grade. Doors adjacent to paneling or millwork to comply with corresponding AWI millwork grade.

Doors shall have Factory Finish of AWI Quality Standards Section 1500, specification for catalyzed vinyl.

Refer to VA TIL PG-18-3 Topic 11. NOISE TRANSMISSION CONTROL for guidance on providing STC rated door assemblies for specific rooms listed in the Program for Design in **Appendix E.**

GLAZED INTERIOR DOORS

Provide vision glazing in doors where it is required by the "Room Requirements" portion of this RFP, or it is deemed advantageous to be able to see through the door, either for safety of pedestrian traffic, or other functional reason.

FIRE DOORS
Provide interior fire doors.

INTERIOR OVERHEAD DOORS
Overhead doors are prohibited from use in corridors and means of egress path.

SHOWER ROOM REQUIREMENTS
Patient toilet rooms shall be built with shower integral to the room design, with a tile finish. Other shower types shall have enclosures with a tile finish. All tile finish enclosures shall comply with the current Tile Council of America standard as contained in VA TIL specifications.

INTERIOR DOOR HARDWARE
Provide standard and special door hardware, such as card key and wander guard system, at door identified by rooms in Appendix E and correlated to VA TIL Prog

SPECIALTIES
COMPARTMENTS, CUBICLES, & TOILET PARTITIONS
Provide toilet partitions in all toilet rooms with more than one water closet or urinal. TOILET AND BATH ACCESSORIES Provide toilet and bath accessories.

MARKER BOARDS AND TACK BOARDS
Provide marker boards and tack boards as indicated by Part 6 E10 "Project Content Logistical report".

IDENTIFYING DEVICES
All necessary interior signage shall be incorporated as part of the architectural drawings. Interior signage is not collateral equipment. Interior signage shall demonstrate complete coordination with the facility design, Interior design, and FF&E submittals. Provide interior directional signage as required for facility wayfinding. Provide an identifying device at each interior door. Signs must meet accessibility requirements. Refer to VA Design: Sign Standards, for more information.

LOCKERS & MARKER BOARDS
Provide lockers as indicated by **Appendix U.**

SHELVING
Provide shelving as indicated by **Appendix U.**

FIRE EXTINGUISHER CABINETS
Provide fire extinguisher cabinets. Cabinet shall be semi-recessed in new construction and surface-mounted in new mechanical/electrical spaces and existing wall construction. Cabinets shall be coordinated with interior finishes.

COUNTERS
Provide solid acrylic counter tops and back splashes.

CABINETS
Provide cabinetry and millwork items with associated accessories. Cabinetry shall be AWI custom grade and have concealed hinges with adjustable standards for shelves. All exposed surfaces will be covered with high pressure plastic laminate clad or hardwood veneer with exposed edges of solid hardwood. Provide plastic backing sheet on underside of countertops, vanity tops, thru-wall counters including back splashes and end splashes of countertops. Use backing sheet on concealed large panel surface when decorative face does not occur.

Provide specific cabinetry as indicated by **Appendix V.**

FIRESTOPPING PENETRATIONS
Provide all sleeves, caulking, and flashing for fire stopping penetrations.

A. Provide firestop systems in compliance with following requirements:
   1. Obtain firestop system for each type of penetration and construction condition from a single firestop systems manufacturer.
   2. Firestop products and systems shall bear classification marking of qualified testing and inspection agency.
   3. Firestopping tests, performed by qualified, testing and inspection agency.
      a. UL or other agency, performing testing and follow-up inspection services for firestop systems, acceptable to local authorities having jurisdiction.
   4. Existing applications for which no tested and listed classified system is available through a manufacturer:
      a. Provide Engineering Judgment or Equivalent Fire Resistance Rated Assembly (EFRRA) for submittal derived from similar UL system designs or other tests approved by local authorities having jurisdiction, prior to installation.
      b. Engineering judgment drawings must follow requirements set forth by International Firestop Council.
   5. Inspect applied firestopping systems in accordance with International Building Code

(IBC) Chapter 17.
a. Inspections shall be performed by an FM 4991 Approved Specialty Contractor/UL Qualified Firestop Contractor and/or ASTM E2174 and ASTM E2393.

B. Identification Labels:
1. Provide identification labels at each firestop assembly.
2. Do not locate identification labels, tags, or both, on finished surfaces or where exposed to view by public.

SPRAYED FIRE-RESISTIVE MATERIALS
Provide sprayed fire-resistive materials to the building's framework to prevent structural failure

ENTRANCE FLOOR GRILLES AND MATS
Provide recessed floor mats at building entrances.

ORNAMENTAL METAL WORK
Provide ornamental metalwork at monumental stairs and balcony rails for all locations other than those provided solely for fire egress.STAIRS

SYSTEM DESCRIPTION
Stairs, including stair construction and stair finishes, shall be provided as required by the building code to provide egress from the building from above or below grade level floors.

GENERAL SYSTEMS REQUIREMENTS

STAIR CONSTRUCTION

INTERIOR AND EXTERIOR STAIRS
Interior stairs shall be constructed of steel with concrete filled pans or cast-in-place concrete.

Exterior stairs shall be constructed cast-in-place reinforced concrete.

Concrete is an acceptable finish for exterior stairs. Exterior concrete stairs shall have cast aluminum treads with abrasive surface.

Steel stairs shall be primed and painted.

FIRE EGRESS STAIRS
Design fire egress stairs of the type and arrangement to conform to Fire Egress Stairs, of NFPA 101, *Life Safety Code*.

HANDRAILS, GUARDRAILS, GUARDRAIL-PANELS AND ACCESSORIES
Handrails and guardrails shall be painted galvanized steel or stainless steel or prefinished aluminum or glass. Handrails and guardrails shall present a smooth, unbroken surface throughout the length of the stair.

Handrails and guardrails shall be finished to withstand extreme wear conditions.

Guardrails shall be higher than code minimum of 42" above finish walking surface and be 60" to 72" minimum above the finished walking surface. Guardrail-panels between 42" and 72" shall be of a clear see-through material.

Metal ladders and railings complying with OSHA requirements shall be provided for access and protection to any mechanical mezzanines, roofs, lofts or other similar spaces.

6 CONVEYING SYSTEMS

6.1 Objectives

Develop separate patient/service elevator systems and lobbies to prevent the co-mingling of patient/materials traffic and public traffic.

The passenger vertical traffic requirements in the new bed tower will basically be pedestrian (visitors and staff) in nature. There will be some patient vehicular traffic such as wheelchairs and motor scooters encountered during the day.

Patient service movement, to be effective, should be separated from passenger visitor traffic in a dedicated patient service elevator system. Proper infection control precludes the mixing of patient and general passenger traffic. In addition to these physiological concerns, the psychological needs of the patient in transit cannot be properly addressed unless a dedicated patient vertical transportation system is provided. Very ill patients or those traveling to and from surgery or for other forms of treatment should not be subjected to the scrutiny and comments from the general public.

Materials supply transport traffic needs within the proposed new bed tower involves, proper, effective on-time delivery of supplies, patient meals, medications and equipment to the patient care units.

The 6" pneumatic tube system serving in the existing hospital should be extended into the new bed tower for small demand request item transport.

Refer to **Appendix H** for the 2014 Transportation and Logistics Report, for additional reference information.

6.2 Design Criteria

Transport systems shall meet the latest Department of Veterans Affairs Design Manual and Program Guide requirements for Transportation and Logistics Delivery.

The following services functions will be supplied from the existing hospital support service departments:

- Medical Supplies Distribution
- Mail Handling
- Sterile Processing
- Linen Distribution
- Staff Uniform Distribution
- Main Food Distribution
- Main Pharmaceutical Distribution
- Laboratory Specimen Analysis
- Major Movable Equipment Handling
- Waste removal

The new bed tower will be mainly served from the existing hospital service departments such as the Central receiving dock, Central supply, Linen distribution, Environmental services and Maintenance engineering.

All material supply and equipment will be received at the existing hospital main loading dock except for Canteen Deliveries. The Canteen will have its own loading dock and service yard accessible from level G. A dedicated Canteen elevator will take supplies directly up to the Canteen.

Medications required in the new bed tower will be supplied from the existing main pharmacy located on level 1, in Building 1.

The pharmacy utilizes an automatic medication robot delivery system that transports meds from the main pharmacy to the patient care unit med rooms in the new bed tower. ADM (Pyxis) machines are used for direct dispensing of unit dose medications on the patient care units.

Demand request medications can be transported from the main pharmacy to the patient care units via the 6" pneumatic tube system.

Materials supply and distribution will occur on the ground level, separate from the public traffic flow.

Medical supplies will be manually transported daily to the patient care unit clean supply rooms from the existing logistics department via supply carts.

Refer to section 6.6 and 6.7 for Nurse Server information.

Soiled linen items are presently processed at the VA Bay Pines laundry facility where the soiled linen carts are washed and restocked with clean bulk linen for return delivery to the existing hospital clean linen assembly room. Clean patient care linen is restocked in each nursing unit linen room. Soiled linen will be collected from each patient room and dropped down a soiled linen chute and collected in a cart on the G level. Soiled linen carts will be transported manually to the existing hospital loading dock for transport to the laundry.

At present, the patient food tray service at the existing Building 1 Bed Tower is a Dinex, retherm Cook Chill system (put into service in 2013) where food trays are assembled in the existing hospital kitchen and transported manually to the patient care units. Consideration is being given to providing on demand individual patient room meal service in the New Bed Tower. This service will be combined with the Canteen food service located on Level 1 of the New Bed Tower.

Patient lab specimens will be collection by a phlebotomist on a scheduled basis and manually taken to the lab for analysis. A 6" pneumatic tube system will be used to transport individual specimen rapid transport demand requests.

Environmental Services will require additional large equipment to maintain the common areas of the new building. An EVS satellite holding area located on level G will be required for staging large cleaning equipment and battery recharging.

Trash will be collected, bagged and taken to a central soiled holding room where the trash bags will be dropped through a trash chute and into a cart located in a trash collection room on level G. The trash chute will also serve the Canteen on Level 1. The trash cart will be transported manually to the existing waste center.

All regulated medical waste material will be transported manually to the existing waste center located adjacent to the main hospital loading dock.

6.3 Trash and Soiled Linen Chutes

The new bed tower addition will incorporate both trash and soiled linen chutes.

Two chute locations per patient care level should be provided.

The Canteen should have access to the trash chute.

The chutes should be 20" galvanized tubes with a flush out system.

Both trash and soiled linen collection rooms should be located on Level G.

6.4 Elevators

Machine Room-less Elevators are not acceptable

Elevator systems required

4 - 4000# Electric Traction Passenger Elevators, 350 FPM

2 - 9000# Electric Traction Patient Service Elevators, 200 FPM

2 – 5000# Electric Traction Materials Handling Elevators 350 FPM

Note –

One of the 5000# materials handling elevators will be capable of automatically transporting the existing Pharmacy Robot.

The other 5000# elevator is required to access the rooftop mechanical room.

6.5 Pneumatic Tube System

The pneumatic tube system for the New Bed Tower will be an extension of the existing 6" pneumatic tube system located in Building 1. The system will interface with the 6" p-tube system at the basement level of the existing hospital. However, the existing blower will be relocated in the mechanical room of the new bed tower along with an additional new blower.

P-tube stations will be required in each nurse's station in each patient care unit.

12 New Standard p-tube stations will be required in the New Tower and 1 super-station to be located within the existing hospital main pharmacy.

A double P-tube station is required in the existing hospital main pharmacy and interface with the existing p-tube and the other required new stations.

6.6 Nurse Servers (none required) – Medical-Surgical Bed Units

These units shall have no nurse servers (mobile or built in) centrally located supply rooms maintained by Logistics.

6.7 Nurse Servers – Built-in – ICU Bed Units

The nurserver should have push button or staff security code card access to nurserver contents.

ICU units shall have corridor built-in nurse server units with a push code lockable door and internal cabinet drawers with the bottom edge at 2'-0" above the finish floor to no higher than 4' above the finish floor Ratio shall be 1 per 4 rooms*. These supplies will be maintained by Nursing and will include items such as IV Fluids, bandages (2x2's and 2x4's), IV start kits, flushes – items pulled from Logistics Pyxis)

* Locate built-in nurse server units at a minimum have them near rooms that are more than 25 steps away from the nearest supply closets. They could also be directly across the corridor from nurse alcoves, where possible.

7 STRUCTURAL INTERIOR DESIGN, SIGNAGE & F, F&E REQUIREMENTS

7.1 General Description:

The interior design package will consist of two parts: Structural Interior Design (SID) and Comprehensive Interior Design (CID). SID and CID shall be submitted according to the requirements listed below. Refer to **Appendix V** for all interior design related reference items, including VA TIL PG 18-14, VA Interior Design Manual and Room Type Finish Schedule. SID shall include design, selection, specification and coordination of interior finish materials that are integral or fixed to the building; including but not limited to floors, walls and wall base, ceilings, millwork and casework, window treatments, built-in furnishings and signage, specialty lighting, doors and trims. Coordination with finishes of fixed equipment shall also be within the scope. CID includes all furniture, fixtures and equipment not covered as part of SID requirements.

7.2 Structural Interior Design Requirements

The interior design of the Bed Tower is meant to fit in with the existing aesthetic of the James A Haley Veterans Hospital campus recent interior finish upgrades completed in Building 1 over the past 10 years, while giving a fresh identity to the new space. Specific guidance regarding interior design character, finish and space planning criteria specific to veterans' hospitals shall be employed from the latest version of VA *Interior Design Manual* and VA Program Guide *Room Finishes, Door & Hardware Schedule PG-18-14.*

Full interior design drawings should include the following in order to fully convey the design and use of interior finishes.

- (3) sets of color boards of final finish selections submitted in size A4 or 8-1/2"x11 in 3-ring binders.
- Finish Specifications
- General finish plans and legends
- Floor design plans

- Wall accent locations
- Elevations for areas of specialty design requirements
- Specialty detailing of interior design elements
- Wall protection locations and definitions
- Full integrated coordination with Architecture in the design of ceilings including specialty finishes and accent locations and specialty lighting.

The interior design is intended to be contemporary, simple, durable and enduring in character and in substance. The design should project a sense of order and clarity of purpose with quiet strength and dignity. Through common themes, materials, and form, patients and staff should experience the interior of the building as developed from an integrated team of architects and designers. The overall interior design aesthetic is intended to create a timeless building design that is both contextually relevant and embodies the character and strength of the Veterans.

7.2.1 The interior design should have the following characteristics:

- Aesthetically pleasing, functional, durable finishes appropriate to the buildings function and budget.
- Acoustic properties of materials, as well as durability and ease of maintenance, shall be considered during material selection.
- Maximize the use of sustainable materials that will meet or exceed required LEED credits.
- Materials and finishes that are domestically made shall take precedence over non-domestically made options.
- Reflect the design of the exterior of the building.
- Coordinate with the adjacent connecting spaces to promote a consistent theme of patient care and service.
- The design and color will be characterized as a unifying color palette with accent colors that relate to the campus.
- Finish materials shall include warm woods, and a crisp neutral palette of core materials repeated throughout.
- Colors, shapes and imagery of the coastal landscape and the local nature of the Tampa area should be integrated throughout the facility to enhance creativity, efficiency and recovery for the patients and their families and staff.
- Elements of water, earth, sun and sky should be used to designate the various floors and as integrated wayfinding elements.
- Accent colors should be used to define spaces as separate entities but remain within a cohesive overall color scheme on the campus. Each level should be color coded to aide in wayfinding.
- The arrival sequence shall be clear and logical with simple decision points which will support way-finding. Refer to chapter 7.3 for interiors signage requirements.

7.2.2 Interior Finish Requirements:

In general, all finishes shall be manufactured in the United States of America (USA). Finishes listed below reflect field finish types listed in VA-TIL (See **Appendix V**) according to project program and VA room codes. All room types must meet the finish requirements listed for each room code in the VA-TIL. Finish codes used below reflect standard codes used in VA-TIL.

VA finish requirements critically affect the unique clean ability, durability, and maintainability of room surfaces and should be strictly followed. Finishes required for the project are not limited to this list. Accent finishes and specialty wall and ceiling finishes may

be used where appropriate in areas that require elevated design and or wayfinding; especially public non-clinical spaces. Where the VA criteria permits flexibility, ensure that early agreement is reached with the MC's Department representative on the minimum acceptable level of surface treatment. Sustainability, maintenance and durability should be primary evaluation attributes when making product selections.

All finishes shall be selected according to principles stated in VA-TIL Section I.B.7 "Selection of Finish Material". Refer to **Appendix V** for Room Type Finish Schedule and VA-TIL PG 18-14 for full design requirements. Finish Schedule is a guide between the VA-TIL and project program requirements. It is the responsibility of the Contractor to ensure compliance with VA-TIL.

7.2.2.1 Flooring Finishes

- General Requirements: All flooring materials shall meet or exceed minimum standards for slip resistance; especially in regard to wet areas. Dynamic Coefficient of Friction A137.1-2002 testing is the preferred testing method. Thresholds shall meet or exceed ABA standards for slip resistance. Floor Score Certified products should take preference when making selections. Ensure curing and floor preparation requirements for each flooring type are specifically included in the product specifications.
- Carpet Tile (CPT) – Water Resistant backing, solution dyed nylon fibers.
- Luxury Vinyl Tile (SVT) – Product shall be a "no-wax" maintenance product for the lifetime of the product. Minimum 20 mil wear layer and 20-year commercial warranty required.
- Porcelain Tile (PT)
- Quarry Tile (QT) – Wet slip resistance shall be equal to or exceed dry slip resistance.
- Resinous Flooring (RES) – Installer must have manufacture training on exact specified product and experience with similar scope installations. Specify the following types according to VA-TIL requirements. Provide slip resistant grit in user-approved texture level for all areas that require a floor drain.
  - Medium/heavy duty, decorative broadcast vinyl chips, integral base required where RES flooring us installed.
  - Heavy duty, decorative epoxy troweled quartz mortar, chemically resistant seamless mortar, integral base required where RES flooring us installed.
- Welded Seam Sheet Flooring (WSF) – Heat welded for seamless installation.
- Rubber Flooring (RF) – Refer to VA-TIL Section I.B.6 for specific information regarding rubber flooring.
- Resilient sheet flooring (RSF) – Chemically welded seams.
- Terrazzo Tile (TT) – Epoxy matrix.
- Terrazzo (TER) - Poured thin-set, epoxy matrix.
- Vinyl Composition Tile (VCT) – Bio-based composition for increased durability over conventional VCT. Use in moderation only when required or when the adjacent flooring type would not be suitable for the space.
- Recessed Entrance Flooring System – Shall be included at all main lobby entrances.

7.2.2.2 Base Finishes:

- Profile Base (PRB) – Rubber with contoured profile.
- Porcelain Tile Base (PT) – Sanitary cove. Ensure tile base products are produced in the same facility as wall tile to ensure exact color match.
- Quarry Tile Base (QT) – Sanitary cove. Ensure tile base products are produced in the same facility as wall tile to ensure exact color match.
- Resilient Base (RB)– Rubber with factory formed inside and outside corners.
- Resinous Base (RES) – Use with Resinous flooring application as integral cove base. Installer must have manufacture training on exact specified product and experience with similar scope installations. Specify the following types according to VA-TIL requirements.
  - Medium/heavy duty, decorative broadcast vinyl chips, integral base
  - Heavy duty, decorative epoxy troweled quartz mortar, chemically resistant seamless mortar, integral cove base
- Resilient sheet flooring (RSF) – Chemically welded seams.
- Terrazzo Tile (TT) – Epoxy matrix.
- Terrazzo (TER) – Poured thin-set, epoxy matrix.
- Welded Seam Sheet Flooring (WSF) – Heat welded for seamless installation.

7.2.2.3 Wall Finishes:

- Ceramic Tile (CT) – Concrete backer board required. Porcelain tile is acceptable in place of ceramic tile where required per VA-TIL.
  - Partial height CT at 4'-0" (at a minimum) to the top shall be used on walls in the following rooms: Janitor closets and toilet rooms. Full height should be used when budget will allow, especially in public spaces.
- Latex Paint – VOC levels shall be no more than 50g/L total after pigments are added.
- Epoxy Paint – Low VOC, water based.
- Scrub-able Paint – Shall exceed standard durability and scratch resistance of the standard Latex paint on the project. It is encouraged to use Scrub-able paint in main circulation corridors and especially public spaces.
- Resinous Wall (RES) - Concrete backer board required.
- Wall covering shall not be used on the interior face of any exterior wall. Wall covering shall be installed over mold resistant gypsum wallboard.
- Acoustical/Tackable wall covering where indicated in VA TIL.

7.2.2.4 Ceiling Finishes:

- General Requirements: Ensure coordination of access locations above ceiling and provide appropriate design provisions for access.
- Acoustical Ceiling Tile (AT) - Ensure maximum acoustic properties suitable for application. Non-ferrous ceiling grid shall be used in spaces where magnetic equipment will be in use. Provide the following special attributes where required according to VA-TIL:
  - Hold down clips
  - Smooth/washable surface
  - Plastic Finish
- Latex Paint – VOC levels shall be no more than 50g/L total after pigments are added.

- Epoxy Paint – Low VOC, water based.
- Resinous Ceiling (RES-W) – Shall be used on ceilings when walls are required to be resinous.

7.2.2.5 Casework and Millwork Finishes:
- General Requirements:
- Counter Tops - Plastic laminate shall not be used for counter top surface on the project. Counter tops shall be limited to solid surface, stainless steel, epoxy resin or engineered quartz as appropriate for the given space.

7.2.2.6 Wall Protection:
7.2.2.7 Window Treatments:
7.2.2.8 Specialty:
- Toilet Partitions –
  - Material shall be Solid Phenolic
  - Non-ferrous hardware.
  - Wall hung/ceiling mounted only.

7.3 Interior Signage Requirements

7.3.1 Interior room identification and code required signs and wall mounted and overhead wayfinding signs shall be provided in accordance the VA Signage Design Guide dated December 2012. These interior signs shall be designed, provided and installed in accordance with this document's requirements for all rooms defined in **Appendix E** and spaces that connect these rooms (such as corridors, halls, passages, means of egress, stairs, elevators, alcoves, etc.) that are not specifically defined in the Space Program for Design.

7.4 Furniture, Fixtures & Equipment

7.4.1 Comprehensive Interior Design (CID) Requirements

- Furniture should be configured to maximize natural day-lighting and outdoor views. This is especially important when configuring systems furniture specifications.
- Upholstery and Furniture Finish General Requirements: All fabrics and furniture finishes shall be able to withstand 10% bleach solution for maintenance cleaning.

8 STRUCTURAL DESIGN

8.1 Structural Scope of Work

The D/B Contractor shall determine whether to design and construct the new bed tower as a steel framed or cast-in-place concrete structure. The structure and its foundation elements shall be designed to resist all applicable gravity and lateral loading. The structure will need to be designed to resist progressive collapse. All exterior walls shall be designed to resist the applicable blast loading. Each of these items is discussed in more detail in the sections below.

8.1.1 Foundations

A limited geotechnical investigation is included in other portions of this document. Any included subsurface information is only for the Contractor's information and is not guaranteed to fully represent all subsurface conditions. The Government shall not be responsible for any interpretation or conclusion by the Contractor drawn from the data or information. The Contractor is required to retain a Geotechnical Engineer experienced

and licensed in the geographic region of the project to interpret the Government provided information as related to his design concept, take additional borings, and develop geotechnical requirements to support design and construction. The Contractor shall bear all costs associated with the site preparation, ground improvement and foundations except as allowed by Contract Clause FAR 52.236-2, "Differing Site Conditions". The Contractor's Geotechnical Engineer shall perform additional subsurface investigation/testing as required to adequately determine all applicable geotechnical factors including the type and capacity of the project foundations.

As a minimum, the successful bidder's Geotechnical Engineer shall perform 10 borings to a depth of 90 feet, and supplementary laboratory classification of soils encountered, on the building site to support the foundation design and/or subsequent pile driving analysis.

The limited geotechnical investigation determined that there was a moderate to moderately high risk for sinkhole development. Sinkhole treatment of pressure grouting may be required.

8.1.2 Basement Construction

The basement walls shall be capable of resisting all applicable earth loading. Basement walls include exterior walls below the first floor level of the building, including walls that are below grade, elevator pits and other pits. Provide basement walls constructed of cast-in-place concrete. Provide waterproofing on basement walls.

8.1.3 Superstructure

The superstructure consists of structural elements above the foundation that provide support for vertical loads and resistance to lateral loads. The floor slab construction shall include either composite concrete slabs on composite steel deck or cast-in-place concrete slabs on removable forms. The floor slab shall be supported on steel beams with steel columns or concrete beams with concrete columns.

The roof construction shall, with the exception of canopies, include either composite concrete slabs on composite steel deck or cast-in-place concrete slabs on removable forms. The roof slab shall be supported on steel beams with steel columns or concrete beams with concrete columns.

Provide the building framing system in accordance with VA Physical Guidelines and the VA Design Manuals.

8.2 Design Loads

Live Loads

Since hospitals undergo renovations every few decades, which often changes the usage of the space, the structure shall be designed with this fact in mind. Minimum live loads shall be as follows:

Ground Floor Uniform Live Load: 125 psf.

1st Floor and Above Uniform Live Load: 100 psf.

File and Computer Room Uniform Live Load: 125 psf.

Roof Uniform Live Load: As required for its use.

Mechanical Areas Uniform Live Load: 150 psf.

Risk Category and Importance Factors

Use Risk Category IV shall be used for determination of Importance Factors for seismic, snow, and ice design.

Seismic Design Category

The Seismic Design Category is A.

Flood Criteria

Base Floor Elevation is 35.0

Wind Exposure

Wind design shall be based on Exposure B.

Basic Wind Speed (Ultimate) is 150 mph.

8.3 Building Superstructure

Structural System

Design and construct the new bed tower as a steel framed or a cast-in-place concrete structure. The D/B Contractor shall make this determination. The structure shall be able to resist all code applicable gravity and lateral forces.

The structure shall be designed to minimize vibration. Human comfort and controlling movement for sensitive equipment are essential to a medical facility. The AISC Design Guide 11, Floor Vibrations Due to Human Activity, is the standard, including errata #1 incorporated into the document. There will be sensitive equipment within the new building. Table 6.1 in the standard has the vibrational velocity requirements for the floors. Operating rooms, computer system rooms, patient rooms, and laboratories are some of the key rooms. Expect the structure to be more robust under these rooms.

8.4 Foundation Requirements

A limited geotechnical investigation performed by H.S.A Engineers & Scientists in 2010 is included as reference. The borings in the limited investigation show medium density sandy soils in the upper 20 to 30 feet underlain by variably stiff to very soft clays. Limestone was found at

depths of 35 to 60 feet below grade. The limited report provides numerous foundation options including:

1. Isolated column footings,
2. Mat foundation with three methods of improving the density of the sandy soils including:
   a. stone foundation columns
   b. rammed aggregate piers
   c. deep soil mixing
3. Auger-cast piles and pile caps
4. Drilled shafts

The limited geotechnical investigation also concluded that there was a moderate to moderately high risk for sinkhole development. Sinkhole treatments like subsurface pressure grouting may serve to restrict and/or seal breaches in the surface of the limestone, thereby reducing the potential for future subsoil raveling and migration.

An expanded geotechnical investigation shall be conducted by the D/B Contractor, in order to design the appropriate foundation elements for the new bed tower. The report should also have recommendations for minimizing the sinkhole potential.

As determined by the Designer of Record to be applicable, provide a standard concrete slab on grade. Where slab on grade is below the existing adjacent exterior grade, provide water/ dampproofing and a perimeter drainage system to remove ground water from the area immediately adjacent to the buildings. Provide perimeter insulation.

8.5 Exterior Wall Requirements

The D/B Contractor will design the exterior wall systems for the project. The current version of the VA Physical Security Design Manual shall dictate design requirements. The D/B Contractor shall hire a Blast Specialist with a minimum of 5 years experience in performing dynamic analysis in blast resistant design. The Blast Specialist shall design the exterior walls for blast loads developed using the semi-empirical relations of UFC 3-340-01, Design and Analysis of Hardened Structures to Conventional Weapons Effects, dated June 2002 (CONWEP). The exterior walls shall be precast reinforced concrete panels, 8 inch non-load bearing masonry block walls, and/or a finish system as defined in Section 01 10 10, part 5.3.2 over cold formed metal framing. The exterior walls shall need to be designed to resist all applicable wind loading plus the blast design requirements of a Mission Critical facility. Therefore, the wall should be able to resist the lesser of a GP2 blast load or the blast load from a W2 explosion at 50 feet with a maximum dynamic deflection of 1/30 of the span length. The connections of the wall to the floors above and below them should be able to resist the reactions from these blast forces.

Exterior fenestration and doors shall be designed to remain in the frame after the blast forces are applied to them. All exterior glass shall be laminated glass. The glass shall be restrained within the mullion with a minimum of a 1/2 inch bite. The mullions shall be designed to resist the blast load equal to the maximum capacity of the weakest lite of supported glass, but no less than the design level pressures while sustaining deformations no greater than 1/30 the span length. The glazing shall also meet the Large Missile Test requirements of ASCE 7 and IBC.

8.6 Antiterrorism Criteria Requirements

Design the facility in accordance with the current VA Physical Security Design Manual as shown in Appendix D to comply with UFC 4-010-01, DoD Minimum Antiterrorism Standards for Buildings. Facility will have an occupancy designated as Mission Critical. The UFC 4-023-03, Design of Buildings to Resist Progressive Collapse, shall be used to design for, and to minimize the potential of, progressive collapse.

9 HEATING, VENTILATING AND AIR CONDITIONING (HVAC)

Contractor-originated design documents shall represent a project design that complies with the Request For Proposal (RFP), and the architectural and engineering discipline VA design guidance listed herein.

9.1 General Design Requirements

This project includes the construction of the new Bed Tower at the VAMC, Tampa, Florida, and the demolition and renovation of the existing area. Refer to site plans for building location.

This section includes the construction of interior mechanical systems. This section covers installations inside the facility and out to the five foot line. See Section 4: Site Civil/Mechanical Utilities, for continuation of systems beyond the five-foot line.

In selecting systems to meet the heating, ventilating and cooling needs of the facility, the design-build team will need to balance the VA requirements for a high performance building with the operation and maintenance requirements of the mechanical systems.

Refer to **Appendix M** for information regarding existing systems.

9.2 HVAC System Design

9.2.1. Bedtower

The VA generally favors all air (VAV /CAV) type systems with hydronic reheat coils over systems which attempt to separate the space conditioning functions from the ventilation requirements of the facility. Such systems might use a DOAS to ventilate the facility while utilizing fan coil units or water source heat pumps to meet each individual zones cooling and heating needs. These systems require additional maintenance due to the increased number of mechanical components and associated filters and shall not be permitted.

Described below is one possible design solution. The design build team will not be limited to the system represented here and shall be free to select alternate system(s) that comply with the project requirements.

A possible mechanical design for the proposed Bed Tower would include an energy recovery system with enthalpy wheel and chilled water coil to precondition and dehumidify the outside air required. Treated outside air would be delivered to each of the facilities air handling units downstream of the AHU's cooling coils. The mixed leaving air temperature for each individual AHU would be controlled by modulating the chilled water coil in the return air stream, with temperature reset to meet the demands of the warmest zone. Where possible, patient rooms grouped according to building exposure should be assigned their own air handling unit to maximize the effectiveness of the supply air temperature reset strategy. It is important that the outside air be sufficiently dehumidified since each respective air handling unit it feeds will primarily perform sensible cooling only.

The building core, including circulation areas, nurse stations, waiting areas and support spaces can be served from a separate VAV AHU(s).

High occupancy spaces such as meeting rooms and dining areas should be provided with C02 sensors and demand control ventilation.

The kitchen shall utilize variable speed hood fans which, in the absence of heat and smoke, allow the reduction of exhaust airflow to 50% of the design flow rate. Air from the dining room can be used for make-up to the kitchen while maintaining necessary air balances. Heat recovery from the kitchen exhaust will not be permitted.

Constant or Variable air volume terminal units with 2-way hydronic reheat coils can provide each patient room with a minimum of 6 air changes per hour, two of which shall be outside air. Toilet exhaust will be collected and fed through the energy recovery unit for energy recovery purposes.

Heating hot water can be generated using steam to hot water heat exchangers.

Chilled water is provided from an existing central utility plant (CUP) and a new satellite chiller plant described below. Both the existing and new chiller plants shall utilize a primary/secondary pumping strategy.

9.2.2. Central Utility Plant (CUP)

The new bed tower shall have a new satellite chiller plant (CUP) integrated into its design that shall be connected into the campus chilled water loop.

Contractor-originated design documents shall represent a project design that complies with the Request For Proposal (RFP), and the architectural and engineering discipline VA design guidance listed as per section (to be coordinated).

General Design Requirements

This section includes the construction of HVAC systems specific to the CUP. This section covers installations inside the CUP and out of the five-foot line. See Section 4: Site Civil/Mechanical Utilities (to be coordinated) for continuation of systems beyond the five-foot line.

In selecting systems to meet the cooling needs of the facility, the design-build team will need to balance the VA requirements for a high performance building with the operation and maintenance requirements of the mechanical systems.

General HVAC Sizing of CUP

The Design Build Contractor shall construct the new CUP as an integral component of the new bed tower.

A new satellite Central Utility Plant (CUP) independent from the existing Building 39 CUP shall be constructed created a double-ended decoupled system (Multiple chilled water

plants on a distribution loop). The Satellite CUP shall provide the campus with an additional 1,250 tons of chilled water cooling capacity with N+1 capability to the campus chilled water loop. Only one chiller will be able to run at a time. The new CUP will be a minimum of 6,000 square feet. Chiller's design conditions will be the same as those in the main chiller plant (Bldg 39) with chilled water entering water temperature (EWT) of 56°F and leaving water temperature (LWT) of 42°F, and condenser water EWT of 85°F and LWT of 95°F. Full load kw/ton and IPLV shall be per VA HVAC Design Manual 2011.

New 14" chilled water supply and return lines shall be routed between the CUP and the main campus loop. They shall be at least 36" below grade where run outside. Special conditions that might necessitate the lines to be placed with less coverage may be considered as long as the lines are protected with a heavy traffic grade concrete slab above them. Chilled water lines for the new bed tower air handling units may tap off the lines that run to the existing campus loop within the new bed tower CUP. The new 14" lines will tie into the existing 16" chilled water supply and return lines in the basement of the south tower of Building 1 (Refer to HVAC Site Plan – New Proposed in Appendix M) (to be coordinated).

The CUP is a mission critical facility. Requirements of the VA Physical Security Design Manual: Mission Critical Facilities shall be incorporated into the design.

Cooling towers shall be in close proximity to the new bed tower building and may be placed on the roof of the new bed tower however; provisions shall be incorporated to allow them to be raised to a higher level roof, if the building is to have provisions to add additional floors.

The satellite CUP shall be sized to house two 1,250-ton chillers; one is for the requisite 1,250-ton capacity. The second is for N+1 capability, and the third is merely a space holder for future. Space shall also be included for six pumps; two primary, two condenser, and two secondary pumps. The condenser water loop and the primary loop shall have be header/manifolded so that any given pump can be energized when any chiller is energized or either chiller can be used with either tower. When any pump is de-energized, it shall be isolated from the loop with motorized valves. Two secondary pumps with taps for the future pump shall be provided. Each of the secondary pumps shall have a VFD. Each secondary pump shall be capable of flowing 2,570 GPM.

The CUP will generally consist of a large mechanical room with an overlooking control room. The control room will have restroom and shower facilities. The height of the mechanical room shall be such that a lift can move a 1,250-ton chiller into place without disturbing the operation of the other chiller(s). The CUP shall have 14 feet wide by 12-foot-high opening (minimum) with insulated high velocity wind rated roll-up doors to facilitate chiller replacement within the mechanical room.

The mechanical room shall have a refrigerant leak detection system complete with field-installed refrigerant sensors, wiring, and local control panel per ASHRAE Standard 15. Provide local alarm in the mechanical room, and remote alarms in the new CUP control

room and the Bldg. 39 CEP control room. Upon activation by the leak detection system, the mechanical room air shall be exhausted outdoors by an emergency exhaust system. Provide exhaust air inlets in accordance with ASHRAE Standard 15.

CUP hydronic specialties shall include a water make-up station with PRV (set consistently with the existing CUP make up pressure), expansion tank (sized for the added CUP and new bed tower system volume), and an air separator shall be provided in the new CUP. Existing CUP and New Satellite CUP Operation

9.2.3. Existing CUP and New Satellite CUP Operation

The existing energy plant (Building 39 CUP) has one 500-ton chiller and five 1,000-ton chillers. They can either be automatically staged by the controls system or selectively staged by the plant operator. The secondary pumps in the Building 39 CUP are currently set to maintain 100 PSI at the pumps.

The ability to stage the chillers for the new CUP shall be able to be performed at the existing CUP controls system or selectively by plant operator located in the existing CUP via controls. The Design Build Contractor shall determine how best to sequence the chillers and how the satellite plant melds into the rest of the campus chilled water system operation. From a conceptual approach, the following is suggested:

9.2.4. Pump control in a double-ended decoupled system

The secondary pump's speed shall be modulated based on pressure sensors located in the loop (point of lowest pressure) within the campus loop. The point of lowest pressure in the loop shifts depending on which buildings are using the most water. A minimum of six sensors shall be equidistantly spaced around the distribution loop. The control system determines the lowest differential pressure signal and uses it to determine what speed signals to send to the distribution pumps. Sending the same speed signal to both distribution pumps is simple and will prevent the pumps from “fighting” each other for the load. If only one chilled-water plant has an operating chiller, the distribution pump associated with that plant should be the only one operating.

9.2.5. Chiller sequencing in a double-ended decoupled system

In addition to pump control, the sequencing of chillers must be integrated between the two plants. Allow each of the CUPs to make start/stop decisions based on the flow in its decoupler.

Starting chillers: When deficit flow is detected at a chilled-water plant, a chiller associated with that plant would be started. This will start chillers in the plant closest to the loads using the most water and help avoid the load/flow imbalance. Deficit flow can be detected by either of the common flow detection methods (temperature sensor or electro-magnetic bi-directional flow meter) to detect water flow direction in the decoupler. It is also suggested

that the 500 ton and one 1,000 ton chiller at the Building 39 CUP be operating prior to enabling chillers in the satellite CUP, and only activate the new pumps/chillers once there is sufficient load such that each of the two new chillers would only be staged on when they would be 100% utilized.

Stopping chillers: When both CUPs have sufficient surplus to shut off a chiller. Only one chiller should be stopped at this time, and it should be the one in the plant with the most surplus flow. Thus, the normal operating mode for a double-ended plant is with one plant in surplus and the other operating

9.3 General Design Parameters

9.3.1 Outdoor Design Conditions:

Use the following conditions for calculating the cooling and heating loads: These conditions are reproduced from the VA 2011 Design Manual and based on 2009 ASHRAE Handbook of Fundamentals.• The A/E can recommend and use (subject to prior approval by VA Authorities) more severe conditions, based on experience and knowledge of local weather conditions.

	Summer		Winter
	Dry Bulb DegF	Wet Bulb Deg F	Deg F
100% OA	92.4	77.4	38.4
Min OA	91.3	77.3	38.4

9.3.2 Indoor Design Conditions:

Refer to requirements of the Room Data Sheets listed in Chapter 6 of the 2011 VA Design Manual and included in the attachment section of this document (Appendix M). Also refer to the design guide plates within the VA's Technical Information Library (TIL) (APPENDIX E).

Provide Ventilation rates and systems per ASHRAE Standard 62.1 - 2007, Ventilation for Acceptable Indoor Air Quality, and ASHRAE Standard 170 - 2008, Ventilation of Health Care Facilities.

Any air handling unit serving occupied spaces shall deliver a minimum of 15% outside air.

The CUP mechanical equipment room shall have a dedicated mechanical cooling unit (space temperature setpoint of 86 def F, cooling), and the CUP control room shall have a dedicated mechanical cooling and heating unit (space temperature setpoint of 75 deg F, cooling, 68 def F heating; 60% RH max).

The HVAC system shall provide each zone with the choice of heating or cooling year round unless otherwise indicated. Each zone shall have its own limited range of control as allowed by the control system central workstation. Each patient room shall be a separate zone.

9.3.3 Mechanical Design Guidance:

Provide the design and installation in accordance with the following references. This Performance Technical Specification (PTS) adds clarification to the fundamental requirements contained in the following Government Standards. The general requirements of this PTS section are located in PTS Section Z10, General Performance Technical Specification.

GOVERNMENT STANDARDS:

Federal Energy Management Program (FEMP)

VA DESIGN MANUALS:

VA HVAC DESIGN MANUAL (MARCH 2011)

VA SUSTAINABLE DESIGN MANUAL (MAY 6, 2014)

9.3.4 General System Requirements:

Provide all required fittings, connections and accessories required for a complete and usable system. All equipment shall be installed per the criteria in this document and the manufacturer's recommendations. Where the word "should" is used in manufacturer's instructions, substitute the word "shall". The design-build team shall ensure that working space is provided around all equipment.

Utilize VA standard details where applicable. A detail catalogue in pdf and dwg formats is available on the TIL.

Note that exposed roof top air handling units will not be permitted due to the high humidity climate classification of this project. All roof top air handling units shall be enclosed in a mechanical penthouse.

Provide mechanical systems and components that support project sustainability and energy goals in conformance with the VA Sustainable Design Manual. Refer to Section 20 for the sustainability requirements of this project.

Provide mechanical systems to be in conformance with the Anti Terrorism Force Protection (ATFP) requirements of the VA Physical Security Design Manual.

The new bed tower should be provided with the capability of future vertical expansion of two additional stories incorporating all the elements required for a high rise classification.

Chilled water, stream and heating hot water piping capacities shall be based on projected future space and population requirements. They shall be designed with valved and capped connections to facilitate ease of future expansion.

Design plans shall show proposed layout for additional mechanical equipment including future air handlers, air intakes and exhaust locations. Stair pressurization ducts and any other infrastructure necessary for high rise classification shall be provided as part of the base building to limit the impact on the facility at the time of vertical expansion.

9.3.5 Design Submittals:

Design Submittals shall be in accordance with General Performance Technical Specifications (to be coordinated) and section Design Submittal Procedures (to be coordinated).

In addition, sections listed below or in the body of the PTS text are to be used by the Designer of Record (DOR) as a part of the design submittal. If the products or systems are applicable to the project, the DOR shall edit these referenced sections and submit them as a part of the design submittal specification. Edit the specification sections in accordance with the limitations stated in General Performance Technical Specifications (to be coordinated).

23 05 11, *Common Work Results for HVAC*
23 05 12, *General Motor Requirements for HVAC Equipment*
23 05 41, *Noise and Vibration Control for HVAC Equipment*
23 05 93, *Testing, Adjusting, and Balancing for HVAC*
23 07 11, *HVAC Insulation*
23 08 00, *Commissioning of HVAC Systems*
23 09 23, *Direct Digital Control System for HVAC*
23 11 23, *Facility Natural Gas Piping*
23 21 13, *Hydronic Piping*
23 21 23, *Hydronic Pumps*
23 22 13, *Steam and Condensate Heating Piping*
23 22 23, *Steam Condensate Pumps*
23 23 00, *Refrigerant Piping*
23 25 00, *HVAC Water Treatment*
23 31 00, *HVAC Ducts and Casings*
23 34 00, *HVAC Fans*
23 36 00, *Air Terminal Units*
23 37 00, *Air Outlets and Inlets*
23 38 13, *Commercial Kitchen Hoods*
23 40 00, *HVAC Air Cleaning Devices*
23 52 25, *Low Pressure Water Heating Boilers*
23 56 00, *Solar Energy Heating System*
23 64 00, *Packaged Water Chillers*
23 65 00, *Cooling Towers*
23 72 00, *Air-To-Air Energy Recovery Equipment*
23 73 00, *Indoor Central Station Air Handling Units*
23 81 00, *Decentralized Unitary Equipment*
23 81 23, *Computer Room Air Conditioners*
23 81 43, *Air Source Unitary Heat Pumps*
23 81 46, *Water-Source Unitary Heat Pumps*
23 81 49, *Ground-Source Heat Pumps*
23 82 00, *Convection Heating and Cooling Unit*
23 82 16, *Air Coils*
23 84 00, *Humidity Control Equipment*
25 10 10, *Advanced Utility Metering System*

9.4 General Technical Notes

9.4.1 Gas Supply System

The need for natural gas is not anticipated.

9.4.2 Steam Supply System

The existing central steam boilers and the central steam distribution system have sufficient capacity to serve the new bed tower and may be considered as the source of heating for the facility. The system consists of three boilers each rated at 17,250 lbs per hour. The peak steam system demand can be currently handled by a single boiler Steam is delivered at 95 PSI.

A connection to the central steam and condensate system can be made in the basement of the main hospital. Refer to the steam and condensate piping drawing located in the attachments section of this document.

9.4.3 Auxiliary Heating Equipment

Provide steam to hot water converter(s) for this facility as required. Provide factory assembled, u-tube units constructed in accordance with ASME BPVC for steam or hot water. Factory assembled plate type heat exchangers may be provided for hot water.

Provide condensate return unit(s) consisting of a floor-mounted receiver and duplex pump unit.

9.4.4 Heating Equipment Thermal Insulation

Provide insulation for steam system equipment, steam to hot water converters, hot water pumps and other associated heating equipment.

Insulate hot water pumps and equipment as suitable for the temperature and service in rigid block, semi-rigid board, or flexible unicellular insulation to fit as closely as possible to equipment.

9.4.5 Chilled Water Systems

The existing chilled water system provides chilled water at 42 degrees F. The existing system utilizes a primary/secondary pumping strategy to deliver chilled water across campus. Each building requiring chilled water is equipped with a set of tertiary pumps. The VA is currently investigating whether the tertiary pumps throughout their facility are necessary. The chilled water distribution piping should include a pump bypass with check and isolation valves to give facilities personnel the ability to bypass the tertiary pumps if/when possible.

Cooling coils should be designed for a minimum 14 degree delta T. A lower water pressure drop through the coils would be desirable to improve the probability of bypassing the tertiary pumps.

Heat recovery chiller(s) may be considered to aid in meeting the sustainable requirements of this project.

Provide insulation and vapor barrier on all chilled water equipment.

Provide chiller controls in compliance with ASHRAE 135 *BACnet - A Data Communication Protocol for Building Automation and Control Networks.*

Provide complete start-up and operational testing of chiller equipment.

9.4.6 Ductwork

Provide insulated, galvanized steel ductwork constructed, braced, reinforced, installed, supported, and sealed per the IMC and SMACNA standards.

Use insulated flexible duct only for connections to air distribution devices to adapt to minor offsets. Flexible duct shall be UL 181 listed and per SMACNA 1966 duct construction standards. Maximum length of flexible ductwork shall be 5 feet.

Provide flexible connectors between fans and ducts.

Provide manual volume dampers in each branch take-off from the main duct to control air quantity except for primary supply ductwork on VAV systems. Dampers shall conform to SMACNA 1966 duct construction standards and shall be seal class "A" construction.

Fire dampers shall be rated per UL 555. Fire dampers shall be dynamic type rated for closure against a moving airstream. Provide fire dampers that do not intrude into the air stream when in the open position.

9.4.7 Louvers

Louvers shall be high velocity wind rated, missile impact rated and wind driven rain resistant without the use of a damper. They shall bear AMCA ratings seal for air performance and water penetration in accordance with AMCA 500L and AMCA 511. Louvers shall be constructed of anodized aluminum alloy or stainless steel. Provide birdscreens.

9.4.8 Hoods

Hoods shall be constructed of anodized aluminum alloy or stainless steel. Provide with birdscreens.

9.4.9 Grilles, Registers, & Diffusers

Factory-finished grilles, registers, and diffusers. Exterior and exposed edges shall be rolled, or otherwise stiffened and rounded. Provide linear slot diffusers with factory furnished insulated supply air plenum for all occupied spaces with exposed perimeter windows, minimum length of supply diffuser shall match window width. For interior spaces provide 24 in x 24 in or 12 in x 12 in supply air diffusers. Limit capacity of a single diffuser to 400 cfm.

9.4.10 Duct Insulation

Provide external thermal insulation for all supply and return ductwork.

Provide insulation with factory applied all-purpose jacket with integral vapor retarder. In exposed locations, provide a jacket with white surface suitable for painting. Flame spread/smoke developed rating for all insulation shall not exceed 25/50. Minimum insulation thickness shall be the minimum thickness required by ASHRAE 90.1. Insulate the backs of all supply air diffusers with blanket flexible mineral fiber insulation.

9.4.11 VAV Boxes

Pressure-independent type variable air volume units rated per AHRI 880. Use of dual duct air terminal units is not permitted. Provide each box with a hydronic heating coil unless not required by space reheat or heating. Provide electronic controls. VAV and CAV air terminal units shall be located above ceilings and allow for maintenance and removal. Lining shall comply with NFPA 90A, UL 181, and ASTMC 665 antimicrobial requirements. Electric resistance reheat coils are not permitted.

9.4.12 Steam Distribution Systems

Provide insulated, black steel steam and condensate piping to serve the HVAC equipment throughout the facility. Condensate piping shall be schedule 80.

Insulate steam and condensate return piping with mineral fiber or cellular glass insulation with all-purpose jacket.

Provide steam pressure reducing station(s).

Provide steam traps with Armstrong SteamEye for wireless remote monitoring.

9.4.13 Hot Water Distribution Systems

Provide a variable speed pumping system to serve the HVAC hot water equipment. Provide insulated steel or copper hot water supply and return distribution piping.

Provide air control and chemical treatment equipment for hot water piping system.

Provide an expansion tank for the hot water piping system.

Provide system flushing and start-up for the hot water piping system.

Provide appurtenances such as air separators, expansion tanks, suction diffusers, strainers, chemical shot feeders and other required features to allow for proper operation of hot water systems.

9.4.14 Heating Hot Water Isolation Valves

Provide isolation valves on supply and return lines at take-offs for each floor/zone.

9.4.15 Heating Hot Water Pipe Insulation

Insulate hot water piping with mineral fiber insulation with factory-applied all-purpose jacket. Provide aluminum metal wrap over insulation for all exterior piping.

9.4.16 Heating Hot Water Valves

Provide shut off valves, appropriately sized relief valves, and appropriately sized balancing valves as necessary to balance water flows, protect components and isolate equipment for service and repairs.

9.4.17 Heating Hot Water Appurtenances

9.4.18 Heating Hot Water Test Ports

Provide test ports in piping at inlet and outlet of all major system components including boilers, pumps, and other equipment as required.

9.4.19 Chilled Water Distribution Systems

For exterior buried chilled water distribution systems, coordinate with Section 04.

Provide a variable speed pumping system to serve the HVAC chilled water equipment.

Provide steel or copper chilled water supply and return piping. Insulate piping with cellular glass insulation.

Provide system flushing and start-up for the chilled water piping system..

9.4.20 Chilled Water Isolation Valves

Provide isolation valves on supply and return lines at take-offs for service to each building(s). Valves shall be located in valve boxes.

9.4.21 Chilled Water Insulation

Insulate chilled water pumps and accessories for the temperature and service in rigid block, semi-rigid board, or flexible unicellular insulation to fit as closely as possible to equipment. Insulate above ground chilled water piping with cellular glass insulation (ASTM C 552, Type II, and Type III). Provide all-purpose jacket with vapor retarder. Provide aluminum metal wrap over insulation for all exterior piping.

9.4.22 Chilled Water Valves

Provide shut off valves, appropriately sized relief valves, and appropriately sized balancing valves as necessary to balance water flows, protect components and isolate equipment for service and repairs.

9.4.23 Chilled Water Test Ports

Provide test ports in piping at inlet and outlet of all major system components including chillers, pumps, cooling coils and other equipment as required..

9.4.24 Exhaust Fans

Fans and power ventilators shall be listed in the current edition of AMCA 261, and shall bear the AMCA performance seal. Fans shall comply with AMCA 210 and AMCA 200. Fan bearings shall have a minimum average life of 200,000 hours at design operating conditions. Provide bird screens for outdoor inlets and outlets. Provide direct-drive type fans with means for verifying operation via the building DDC system or with speed controllers.

9.4.25 Air Handling Units

Provide solid double wall air handling units.

All chilled water and refrigerant coils exposed to outside air shall be equipped with multi-stage, electro-deposit coating (E-coating) of 1-mil thick epoxy lining. Cooling coils shall be constructed of copper tubes, aluminum feeds and stainless steel headers.

Drain pans shall be stainless steel.

Each air handling unit shall be provided with two pre-filter sections located upstream of the coil sections, and final filters as required by Chapter 6 of the 2011 VA HVAC Design Manual.

At least one nursing wing shall be designated as an emergency epidemic wing. The wing shall be capable of being fully exhausted and air discharged 10' above the roof at 3,500 fpm. Refer to Nursing Wing – Air Handling Unit data sheet in the HVAC Design Manual.

AMCA 210 certified fans with AMCA seal. Fan bearings shall have a minimum average life of 200,000 hours at design operating conditions. Provide bird screens for outdoor inlets and outlets.

Fan motors shall be premium efficiency, inverter duty rated.

Fans shall be provided with shaft grounding rings.

Provide AHU's serving patient care areas with N+1 redundancy for both the supply and return fans. AHU's shall be limited to no more than 50,000 cfm and fan arrays to a maximum of 4 fans per air handling unit.

The air handling unit(s) serving the CUP shall be provided with pre-filter section and a MERV 13 filter section located upstream of the coil section, and shall have a factory assembled, UL-listed heater and integral control cabinet.

9.4.26 Pumps

Centrifugal circulating pumps with motor, motor starter, and motor enclosure conforming to the appropriate NEMA standards. Insulate pumps used for hot service and chilled water service.

9.4.27 Variable Frequency Drives

Factory-assembled variable frequency drive control systems for variable speed control. All air handling unit and pump VFD's shall be from the same manufacturer. Each VFD shall include motor starter, motor disconnects and controls as required for a complete system. Units shall be UL-listed and comply with the National Electric Code.

Provide the following accessories:

Disconnect switch
Control circuit transformer, with primary and secondary fuses
Manual bypass
System hand-off-auto switch with provisions for remote start/stop of the system.
System initialized light
Run light
Failure alarm
LCD digital display with numeric keypad

Provide a control interface for remote monitoring of VFD functions and alarms from the DDC control system computer.

9.4.28 Energy Recovery Wheels

Total energy (enthalpy) type energy recovery wheels (heat wheels). Media shall be aluminum with a flame spread index of 25 and less and smoke developed rating of 50 and less. When latent heat transfer is required, surfaces shall be coated with a non-migrating (permanently bonded) absorbent specifically developed for the selective transfer of water vapor. Equal sensible and latent recovery efficiencies shall be documented through a certification program conducted per ASHRAE 84 and AHRI 1060. The energy recovery wheel shall have an insulated housing of double wall construction, rotor seals that are specifically designed to limit cross-contamination, and a rotation detector. Should rotation stop, the rotation detector shall alarm the HVAC control system. Filter sections shall be readily accessible for maintenance.

9.4.29 Heat Pipes

Factory fabricated, assembled and tested heat pipes with counter-flow arrangement. Provide hermitically sealed, seamless aluminum tube cores with extended surfaces. Heat exchanger frame shall be constructed of not less than 16-gage galvanized steel and fitted with intermediate tube supports, and flange connections. Provide tube end covers and a partition of galvanized steel to separate exhaust and supply air streams without cross-contamination. A refrigerant shall be used as the working fluid. Type I refrigerants are not allowed.

9.4.30 Chemical Treatment

Provide hot water systems with chemical treatment system for the control of pH, scale formation, and corrosion inhibition. Provide shot-type feeders for manual chemical feed. Feeders shall be rated for use with pressures up to 130 PSI (900 kPa) (gage).

Provide condenser water systems with automatic chemical treatment systems that monitor conductivity, and pH, and provide for water metering and bleed-off. Provide chemicals in accordance with EPA and equipment manufacturer's recommendations.

The chilled water system shall be a continuation of the existing system and will not require separate water treatment.

9.4.31 Piping Identification

Provide piping identification labels or Stencil names or code letters for piping systems in clearly visible letters and symbols. Provide arrow-shaped markings to indicate direction of flow.

9.4.32 Pipe Sleeves

Provide pipe sleeves at each wall and floor penetration. The sleeve shall be of a material suitable to protect the carrier pipe (two pipe sizes larger) and sealed with an appropriate flexible material. Provide fire stopping in fire rated walls in accordance with IBC.

9.4.33 System Flushing

Thoroughly flush hydronic systems prior to system startup. Isolate coils during initial flushing until water is clear.

9.4.34 System Testing and Balancing

Provide HVAC systems testing and balancing of all air and water systems that complies with the requirements specified in Specification Section 23 05 93, Testing, Adjusting, and Balancing for HVAC. The Designer of Record shall prepare Specification Section 23 05 93, as a part of the project specification and shall include the prepared specification section in the design submittal for the project.

9.4.35 HVAC Commissioning

Mechanical systems to be commissioned, include HVAC systems and controls, refrigeration systems and controls, renewable energy systems, and domestic hot water systems. Commission the HVAC systems per the Commissioning Plan as required by Specification Section 23 08 00, *HVAC Commissioning*. HVAC system commissioning shall coordinate with and incorporate the testing, reporting, training & O&M documentation requirements of 23 05 93, *Testing, Adjusting, and Balancing for HVAC* and 23 09 23, *BACnet Direct Digital Control Systems for HVAC*.

Refer to Commissioning Section 21 for additional information (to be coordinated).

9.4.36 Measurement and Verification

Per DOE Guidelines issued under Section 103 of EPACT, install building-level utility meters in new major construction and renovation projects to track and continuously optimize performance. Memorandum of Understanding (MOU) mandates that the actual performance data from the first year of operation shall be compared with the energy design target. After one year of occupancy, the A/E shall measure all new major installations using the ENERGY STAR® Benchmarking Tool for building and space types covered by ENERGY STAR® or FEMP-designated equipment. The A/E shall submit a report of findings to the Contracting Officer's Representative.

9.4.37 Performance Verification and Acceptance Testing

Verification of satisfactory HVAC system performance shall be via Performance Verification Testing, as detailed in this section.

The Government reserves the right to witness all Acceptance Tests and Inspections, review data, and request other such additional inspections and repeat tests as necessary to ensure that the system and provided services conform to the stated requirements.

The Qualified Testing Organization shall provide the Acceptance Tests and Inspections test plan and perform the acceptance tests and inspections. Test methods, procedures, and test values shall be performed and evaluated in accordance with appropriate standards, and the manufacturer's recommendations. Equipment shall be placed in service only after completion of required tests and evaluations of the test results have been completed. Contractor shall supply to the testing organization complete sets of shop drawings, settings of adjustable devices, and other information necessary for an accurate test and inspection of the system prior to the performance of any final testing. Perform acceptance tests and inspections on Computer Room Air Conditioning Units, Direct Digital Control System, and HVAC Testing/Adjusting/Balancing.

9.5 General Direct Digital Controls (DDC)

Provide integration of the new DDC controllers to the existing Johnson Controls Inc. DDC head

end in the central energy plant (Bldg. 39).

The new CUP control room shall serve as a fall-back control room for all plant operations and the console in the new CUP shall be capable of managing the controls for the entire campus with access the control system graphics and change adjustable setpoints with the proper password(s).

Provide a remote user workstation in the new bed tower penthouse using a standard web browser to access the control system graphics and change adjustable set points with the proper password. Confirm if needed being there is one in the CUP.

The DDC control system shall be native BACnet.

Provide meters, monitored by DDC, on all of the building's incoming utilities (steam, water and electric). Set up trend reports to record data hourly and store values in the operator workstation DDC computer.

The data storage capacity of the DDC shall be capable of storing at least 5 years worth of metering data in addition to all HVAC DDC trends and functions.

Provide flow rate meters, monitored by the DDC system, for chilled water flow, cooling tower make-up and cooling tower blow down.

Provide air handlers and all terminal units, including VAV boxes, with discharge/supply temperature sensors.

Provide central air handler unit outside air CFM air flow monitoring stations.

Provide control to automatically start back-up pumps (or other HVAC equipment) if the primary device fails. Primary and back-up equipment starter circuits shall be wired to prevent both pieces of equipment from operating at the same time. Rotate primary and back-up HVAC equipment monthly (adjustable) with a lead/lag control routine.

Pressure monitoring of isolation rooms should be accomplished with ball-and-tube monitors rather than a more sophisticated controls based monitoring system.

Checkpoint wireless temperature monitors shall be provided for critical refrigerators, freezers and incubators.

The Designer of Record shall use Section 23 09 23, and submit the edited specification section as a part of the project design submittal.

Design requirements shall be in accordance with all specification notes and the BAS Owner shall be identified and designated early in the design documentation.

The system shall have stand alone digital controllers, a communication network, and a workstation computer with control software. Provide stand-alone control routines that operate without connection to the network during a loss of communication. Provide trending, scheduling and alarm tables (may be included with the sequence of operation). Provide reset routines (based on outdoor air temperature or zone demand) for hot water loop temperature setpoints, AHU discharge temperature setpoints (when practical) and supply air static pressure control. Use

alarming and trending services during performance testing or commissioning. Alarm every sequence routine when out-of-limits or control/response failure occurs. Display all graphic floor plans, equipment graphics, DDC ladder diagrams, and sequence of operations graphic pages.

All 120-volt wiring shall comply with NFPA 70. All 24-volt wiring shall comply with the IMC and terminal device manufacturer's recommendations.

Provide training on the installed system according to the maximum training days in 23 09 23. All operator workstation functions requiring BACnet services, i.e., navigating through the graphic displays, trending, alarming and monitoring of the new controls system must be demonstrated from the existing operator workstation using only the existing application software and without the need to launch other applications or logon to other vendor applications.

10 (SECTION 10 NOT USED)

11 PLUMBING

11.1 General Design Requirements

Provide working space around all equipment. Provide concrete pads under all equipment. Provide all required fittings, connections and accessories required for a complete and usable system. All equipment shall be installed per the criteria of this document and the manufacturer's recommendations. Design and installation shall be in accordance with the VA Plumbing Design Manual. Where the word "should" is used in the manufacturer's recommendations, substitute the word "shall".

11.1.1 Codes and Standards: The following is a list of the applicable codes, standards and regulations related to the Plumbing Systems of this project.

- 11.1.1.1 International Building Code – edition as adopted by the State of Florida.
- 11.1.1.2 International Plumbing Code – edition as adopted by the State of Florida.
- 11.1.1.3 NFPA 54 – ANSI Z223.1 National Fuel Gas Code latest edition.
- 11.1.1.4 NFPA 70 – National Electrical Code latest edition.
- 11.1.1.5 VA Plumbing Design Manual – November 2014.
- 11.1.1.6 CDC Guidelines for Environmental Infection Control in Health Care Facilities.
- 11.1.1.7 Facility Guidelines Institute – Guidelines for Design and Construction of Health Care Facilities latest edition.
- 11.1.1.8 Green Guide for Healthcare
- 11.1.1.9 NFPA 55 – Compressed Gases and Cryogenic Fluids Code latest edition.
- 11.1.1.10 NFPA 99 – Standard for Health Care Facilities latest edition.

11.2 General Plumbing Materials, Equipment and Fixture Reqs

Provide quantity and type of materials, equipment and fixtures required for the occupancy, use, and functions described for this facility.

11.2.1 Unacceptable Items:

One-piece bath and shower module enclosures at any of the 140 patient bed rooms.

11.2.2 Piping and Fittings:

Provide Copper tubing and fittings for above ground and buried piping. Use copper tubing and fittings for pipe sizes 4 inches (100 mm) or smaller. Use type L tubing above ground with solder fittings. For buried piping, use type K tubing with solder fittings.

11.2.3 Isolation Valves:

Provide isolation valves at supply to each floor and each branch line into a room or suite. Provide hose bibs in mechanical. Provide hose bibs along the building exterior such that all points along the perimeter can be reached with a 100 foot (30 meter) long hose.

11.2.4 Backflow Preventers:

Provide backflow preventers of types and at points within domestic water systems as required by code. Locate inside the mechanical room on service entrance lines where not provided exterior to the building.

Furnish proof that each make, model/design, and size of backflow preventer being furnished for the project is approved by and has a current "Certificate of Approval" from the Foundation for Cross-Connection Control and Hydraulic Research (FCCCHR)-USC. Listing of the particular make, model/design, and size in the current FCCCHR-USC will be acceptable as the required proof. Provide freeze protection for aboveground exterior applications in areas where the winter design temperature is at or below freezing.

11.2.5 Domestic Water Pressure Booster System:

Located on the Ground Floor. The system shall be factory assembled, tested, and certified by a single manufacturer who assumes undivided responsibility for the system to include providing start-up services, two days instruction and furnishing related operations and maintenance manuals. The system will consist of a minimum of two pumps mounted on a single, welded structural steel base. Provide bladder type low-flow accumulator storage tank, lead-lag pump alternator selector switches and all related controls and alarms required for safe and proper system operation. Provide variable frequency drive pump operation.

11.2.6 Water Softener:

If a water softener is required it will be sized and design to serve the total building.

11.2.7 Steam Heat Exchanger:

Double wall copper tube domestic water heating elements constructed with air gap to atmosphere between the two walls using steam as the heating medium exterior of the heating elements. Provide posted operating instructions for water heaters.

11.2.7.1 Solar Hot Water System:

A solar domestic hot water heating system will be considered for this project to save energy in heating water for domestic purposes. This will save on plant steam being used for heating of the domestic hot water. The system will be an indirect type, pump circulated system using a separate glycol water loop to circulate through the solar collectors mounted on the roof of the building. The glycol mixture will be propylene glycol and water since its toxicity is low. The separate glycol and water loop is required due to the possibility of freezing in this area of the country. The glycol and

water mixture will be circulated from the collectors back to a thermal storage tank located in [the Mechanical room] of the building. The circulating pump will be controlled by a differential thermostat which will sense the temperature difference between the water at the solar collector and the storage tank. The thermal storage tank will have a heat exchanger to transfer the heat to the domestic cold water which will be fed to the domestic steam to water heaters in the mechanical room. The steam to water heaters are required to provide backup heating in the event of cloudiness or night time demands, in addition it will aid in assuring temperature in the domestic hot water system. The solar collector loop and the thermal storage tank will have pressure and/or temperature relief devices to protect the equipment from over pressurization. The discharge from these devices will be directed to a safe location with a drain.

11.2.8 Expansion Tanks:

Steel expansion tank with potable water rated polypropylene or butyl lined diaphragm at water heater.

11.2.9 Inline Pumps:

In-line circulator for service water distribution system. Factory assembled and tested pumps constructed of materials suitable for hot domestic water service.

11.2.10 Water Meters:

AWWA C701 turbine type, with register reading in liters and U.S. gallons.

11.2.11 Insulation and Identification:

Provide mineral fiber insulation with vapor barrier on domestic hot water supply and recirculation piping. Provide cellular glass insulation with vapor barrier on domestic cold water supply piping. Provide identification for piping and equipment.

11.2.12 Water Hammer Arrestors:

PDI WH 201, water hammer arrestors in lieu of air chambers.

11.2.13 Icemaker Connector Box:

Recessed wall box fabricated of PVC plastic. Provide bronze shut-off valve.

11.2.14 Piping Supports:

Provide piping supports in accordance with the local code. Provide inspections, disinfection, and testing in accordance with the specifications.

11.2.15 Sanitary Waste Piping & Fitting:

Provide cast iron hub and spigot and hubless pipe and fittings, rubber compression gasket joints for above and below ground installation.

Cast iron hub and spigot pipe and fittings, rubber compression gasket joints or cast-iron hubless pipe and fittings, CISPI 301 with CISPI 310 couplings. Where indicated in ESR Section D20, plastic PVC or ABS piping, fittings, and solvent cement per ASTM D 2665

or ASTM D 2661 may be provided. Plastic piping shall be equipped with approved fire stopping devices as required by code.

11.2.16 Cleanouts:

Provide cleanouts as required by code. Material shall be consistent with the piping system materials.

11.2.17 Sanitary Vent Piping & Fittings:

Provide cast iron hub and spigot and hubless pipe and fittings, rubber compression gasket joints.

Cast-iron hubless pipe and fittings, CISPI 301 with CISPI 310 couplings. Where indicated in ESR Section D20, plastic PVC or ABS piping, fittings, and solvent cement per ASTM D 2665 or ASTM D 2661. PVC piping shall be equipped with approved firestopping devices as required by code. Single drainage/vent stack systems (such as Philadelphia system) and mechanical air admittance valves are not acceptable.

11.2.18 Submersible Sump Pumps:

Factory assembled and tested submersible type pumps for operation under water.

11.2.19 Sewage Pumps:

FS A-A-50555, single or duplex type to meet demand. Duplex types shall be provided with automatic controls to alternate the operation from one pump to the other.

11.2.20 Rain Water Drainage Piping & Fittings:

Provide Cast iron hub and spigot and hubless pipe and fittings above and below ground.

Cast iron hubless pipe and fittings, CISPI 301 with CISPI 310 couplings. Where indicated in ESR Section D20, plastic PVC or ABS piping, fittings, and solvent cement per ASTM D 2665 or ASTM D 2661 may be used. PVC piping shall be equipped with approved firestopping devices as required by code. Size and install piping in accordance with the local code requirements.

11.2.21 Perimeter Foundation and Underslab Drainage (If Required):

Per geotechnical consultant's recommendations foundation drainage system may be provided.

Ground water collected by the foundation drainage system will be directed into storm wastewater lift station in the mechanical room from which it will be pumped if it can not be drained by gravity into the interior storm water system or outside the building into the city storm sewer.

Piping Material: Flexible perforated PVC or PE (polyethylene) tubing.

11.2.22 Insulation & Identification:

Provide the same as domestic water piping. Mineral fiber insulation on all drainage piping that may be subject to condensation and horizontal rain water drainage. Provide a vapor retarder. Identify aboveground pipe with the type of service and direction of flow. Letter size, lengths and colors shall be per ANSI A13.1.

11.2.23 Natural Gas Piping (If Required):

Contractor is responsible for any applications and permits, and shall provide the complete natural gas system from the load side of the utility meter to the heating equipment. The Contractor shall have the local gas utility provider install piping and appurtenances up to the load side of the meter.

11.2.24 Acid Waste Systems (If Required):

Acid-resistant DWV pipe, fittings, and couplings with mechanical, bell and spigot, or fusion type joints. Material for buried piping and aboveground piping shall be silicon-iron composition. Borosilicate glass pipe and fitting may be provided for aboveground piping where acid composition dictates, except vent piping through and above roofs shall be silicon-iron composition. Provide cleanouts and drains as specified for DWV piping, except material shall be silicon-iron composition.

11.2.25 Grease Interceptors:

Provide in accordance with the PDI G 101.

11.2.26 Air Compressor (For Shop Pheumatic Tools and Air Guns):

Factory packaged electric motor driven, duplex air compressor including manufacturer's standard air filter, oil filter, and plug drain. Air compressor, after cooler, and receiver shall be factory packaged as a unit. Receiver tank shall be per ASME PBVC Sec. VIII D1, labeled and rated for 125 PSI (862 kPa) gage, equipped with required valves and trimmings, including gage and automatic drain valve and ASME BPVC pressure safety relief valve. Air compressor and receiver shall be sized in accordance with the Compressed Air and Gas Institute (CAGI) guidelines to deliver the demand required for the shop tools it is serving. Locate air compressor away from noise sensitive areas.

11.2.27.1 Refrigerated Air Dryer:

Low-pressure compressed air dryer of the mechanical refrigeration type, equipped with an automatic temperature shutdown switch to prevent freezing, a regenerative air-to-air exchanger (as standard with the manufacturer), and a main compressed air cooling exchanger. Refrigeration system shall use non-CFC refrigerant and shall cool compressed air to dry the air. Dryer operating pressure shall be not less than 125 PSI (862 kPa) gage. Dryer size shall be based on system pressure, the entire system air flow, and provide air with a dew point 5 degrees F (-15 degrees C) lower than the most stringent equipment or outlet requirement. The pressure drop of the dryer shall not exceed 2 PSI (13.8 kPa) gage.

11.2.27.2 Compressed Air Piping System:

Piping shall conform to the requirements of ASME B31.1 for materials, assembly, and testing. Piping shall be steel, black seamless schedule 40 carbon steel per ASTM A 53/A 53M with threaded fittings or copper tubing

per ASTM B 88, Type K or Type L, hard drawn, Class 1, with wrought copper or bronze fittings. Provide compressed air drops in locations to facilitate work required with quick disconnects throughout the work areas to allow connection of such as pneumatic tools and air guns. Each air drop shall be equipped with a filter/moisture separator, pressure gauge, air pressure regulator, and a quick-disconnect.

11.2.27 Legionella Prevention:

11.2.28.1 Continuous Disinfection Preventive Control Measures:

The contractor shall install a chlorine dioxide system for disinfection of Legionella Prevention. This system shall be coordinated with the VAMC Water Safety Committee and must be permitted by the state. A long term maintenance contract for operation of the system shall be contracted by an outside service to monitor the system for compliance.

Fixed and Portable Sampling and Monitoring

Fixed Monitoring located on each floor of building, for each system shall record ClO_2, PH, Conductivity and temperature for cold, hot and hot water return systems weekly. System shall be within the EPA maximum contaminant level (MCLG) of 1.0 mg/l, and the maximum residual disinfectant level (MRDLG) of 0.8 mg/l.

Sampling and monitoring of ClO_2 levels will be performed by the VAIHS personnel and recorded. Sampling of distal sites quarterly for Legionella and Bacteria levels will be completed by a third party laboratory.

Portable Monitoring shall be performed monthly by VHA personnel. Portable unit will be taken to each quick connection location per riser and record ClO_2, PH, Conductivity and temperature for cold, hot and hot water return systems monthly. Systems shall be within the EPA maximum contaminant level (MCLG) of 1.0 mg/l, and the maximum residual disinfectant level (MRDLG) of 0.8 mg/l.

Re-Circulation

The hot and cold water shall be re-circulated to the fixture to assure there are no dead legs in the system that could get contaminated.

11.3 General Plumbing Fixtures

Provide quantity and type of plumbing fixtures required for the occupancy, use, and functions described for this facility. Refer to Room Requirements Section for additional specific requirements for spaces with plumbing fixtures. Provide handicapped fixtures in accordance with the referenced criteria in the Project Program. Plumbing fixtures shall be provided as specified. Provide EPA's "WaterSense" labeled fixtures where available and meet the flush/ flow requirements per UFC 1-200-02.

Refer to the VA Plumbing Design Manual Article 3.5 Plumbing Fixture Schedule for the number and types of Water Closets.

11.3.1 Flush Valve Water Closets:

ASME A112.19.2, white vitreous china, siphon jet, floor mounted back outlet. Provide ASME A112.19.5 trim. Provide self-closing metering type flush valve, unless electronic flush control is. Electronic flush control shall conform to UL 1951 and ASSE 1037. Flush valve shall not exceed 1.28 GPF (4.8 LPF). Handicapped fixture mounting height and appurtenances shall be in accordance with UFAS and ADAAG.

11.3.2 Flush Valve Urinals:

ASME A112.19.2, white vitreous china, wall-mounted, wall outlet, siphon jet, integral trap, extended side shields. EPA "WaterSense" labeled. Provide large diaphragm (not less than 2.625 inches (66 mm) upper chamber inside diameter at the point where the diaphragm is sealed between the upper and lower chambers) flush valve of chrome plated cast brass conforming to ASTM B 584, including vacuum breaker and angle (control-stop) valve. Maximum flush valve volume per flush shall not exceed 0.5 gallons per flush (1.9 lpf). Provide ASME A112.19.5 trim and ASME 112.6.1M concealed chair carriers. Provide self-closing metering type flush valve, unless electronic flush control is specified. Electronic flush control shall conform to UL 1951 and ASSE 1037.Handicapped fixture mounting height and appurtenances shall be in accordance with UFAS and ADAAG.

11.3.3 Countertop Lavatories:

Unless integral bowl is specified elsewhere, lavatories shall be white, ASME A112.19.2 vitreous china lavatories with minimum dimensions of 20 inches (508 mm) wide x 18 inches (457 mm) front to rear, and self-rimming type. Provide ASME 112.18.1 copper alloy centerset faucets unless self closing metering or electronic control is specified. Faucets shall be EPA "WaterSense" labeled. Provide with aerator, adjustable P-traps, and perforated grid strainers, unless pop-up drain fittings are specified.

11.3.4 Wall Mounted Lavatories:

ASME A112.19.1, white enameled cast-iron or ASME A112.19.2 white vitreous china with ASME A112.6.1M concealed arm carrier support, with minimum dimensions of 20 inches wide by 18 inches (508 mm wide by 457 mm) front to rear. Provide ASME 112.18.1 copper alloy centerset faucets unless self closing metering or electronic control is specified. Faucets shall be EPA "WaterSense" labeled. Provide with aerator, adjustable P-traps, and perforated grid strainers, unless pop-up drain fittings are specified.

11.3.5 Handicapped Lavatories:

Same as Paragraphs 1.1 or 1.2, except height and appurtenances shall be in accordance with UFAS and ADAAG.

11.3.6 Countertop Sinks:

ASME A112.19.3 sink, 20 gage stainless steel with integral mounting rim, minimum dimensions of 33 inches (840 mm) wide for two compartment or 21 inches (560 mm) wide for one compartment by 21 inches (560 mm) front to rear, with ledge back and undersides coated with sound dampening material. Provide top-mounted ASME A112.18.1 copper alloy faucets, swing spout with aerator, and stainless steel drain outlets with cup strainers. Provide adjustable P-trap with drain piping to vertical vent

stack. Provide UL 430 waste disposer unit in right compartment.

11.3.7 Mop Sinks:

Pre-cast terrazzo floor-mounted mop sink, 36 inches x 36 inches x 12 inches (914 mm x 914 mm x 305 mm) shall be made of marble chips cast in white Portland cement to a compressive strength of not less than 3625 PSI (25 mPa) 7 days after casting. Provide brass body drains with nickel bronze strainers cast integral with terrazzo. Provide stainless steel rim guard for mop sink. Provide chrome-plated exposed hot and cold water faucets ASME A112.18.1 wall-mounted copper alloy faucets swing spout with 3/4 inch (20 mm) hose connection, vacuum breaker, and pail hook. Provide mop hanger on wall above sink suitable for four mops.

11.3.8 Shower Floors:

Precast terrazzo or Acrylic Shower Floors: Terrazzo shall be made of marble chips cast in white Portland cement to produce a compressive strength of not less than 3625 psi (25 MPa) 7 days after casting. Provide brass body drains with nickel bronze strainers cast integral with terrazzo.

11.3.9 Bathtubs:

ASME A112.19.1 white enameled cast-iron or porcelain steel bathtubs, recessed type, minimum dimensions of 56 inches (1424 mm) wide by 30 inches (762 mm) front to rear by 16 inches (406 mm) high with drain outlet for above-the-floor drain installation. Bathtub and shower supply fittings shall be diverter type with body mounted from behind the wall. Provide tub over fill rim spout with diverter.

11.3.10 Shower Supply Fittings:

ASME A112.18.1, ball joint, self-cleaning, adjustable spray pattern shower heads, connected to concealed pipe connected to copper alloy pressure balance single control type mixing valves with front access integral screwdriver stops. Showerhead shall be EPA "WateSense" labeled. Anchor the mixing valves and the pipe to each showerhead in wall to prevent movement.

11.3.11 Handheld Shower Head:

ASSE 1014, adjustable spray hand-held shower head with swivel fitting, 60 inch (1524 mm) minimum flexible chrome plated copper alloy hose and in-line vacuum breaker. Provide push button flow control if specified in ESR section D20. Provide 25 inch (635 mm) grab bar with sliding spray holder that locks at any height

11.3.12 Electric Water Coolers:

AHRI 1010, wall-mounted, bubbler style, air-cooled condensing unit, 4.0 gph (4.20 mL per second) minimum capacity, stainless steel splash receptor, double wall heat exchanger, and all stainless steel cabinet. Provide ASME A112.6.1M concealed wall hangers with thru-bolts and back plates. Handicapped fixture mounting height and appurtenances shall be in accordance with UFAS and ADAAG.

11.3.13 Emergency Fixtures:

Pressure-compensated tempering valve is required for emergency fixtures, with leaving water temperature set point adjustable throughout the range 60 to 95 degrees F (15.5 and 35 degrees C) unless cold water supply meets temperature criteria.

Where indicated provide packaged, UL listed, alarm system; including an amber strobe lamp, horn with externally adjustable loudness and horn silencing switch, mounting hardware, and waterflow switch, assembled and prewired for waterproof service within NEMA Type 3 or 4 enclosures or for explosion proof service within NEMA Type 7 or 9 enclosures.

11.3.14.1 Emergency Shower:

ISEA Z358.1, wall-mounted self-cleaning, non-clogging 10 inch (250 mm) diameter stainless steel deluge shower head with elbow, one inch (25 mm) full-flow stay-open ball valve with pull rod and 8 inch (200 mm) diameter ring or triangular handle, one inch (25 mm) interconnecting fittings.

11.3.14.2 Emergency Eye and Face Wash:

ISEA Z358.1, wall-mounted self-cleaning, non-clogging eye and face wash with quick opening, full-flow valves, stainless steel eye and face wash receptor. Provide copper alloy control valves.

11.3.14.3 Combination Emergency Shower and Eyewash:

ISEA Z358.1, column mounted on a floor flange. Design combination unit so components can be operated individually from a common fixture supply line. Provide a self-cleaning, non-clogging 10 inch (250 mm) diameter stainless steel deluge shower head with elbow, full flow stay-open ball valve with pull rod and 8 inch (200 mm) diameter ring or triangular handle one inch (25 mm) interconnecting fittings. Provide a self-cleaning, non-clogging eye and face wash with quick opening, full-flow valves, stainless steel eye and face wash receptor. Provide copper alloy control valves.

11.3.14 Floor Drains:

Provide floor drains in mechanical rooms, restrooms, and plumbing chase areas.

Floor drains shall be flush strainer or extended rim type. Provide in mechanical rooms, restrooms, fire pump room, laundry room, and plumbing chase areas. Provide floor sinks in kitchens. Provide floor sinks where required for interior air handling unit condensate drains. Insulate the sanitary piping and floor drain body if the floor drain is receiving condensate.

11.3.15 Roof Drains:

Provide roof drains that are compatible with the roofing system. Roof drains shall conform to ASME A112.6.4, with dome and integral flange, and shall have a device for making a watertight connection between roofing and flashing.

11.4 Medical Gases and Vacuum

All medical gas systems installations shall comply with requirements of NFPA 99, and the installing contractors, inspectors and verifiers shall be certified for installation of medical gas

systems by certifying agency such as NITC. Contractors, inspectors and verifiers shall provide documentation of medical gas installations of similar size and complexity continuously over the past (5) five years.

In addition to the alarm panels required by NFPA 99 alarm panels shall be provided for anesthetizing and critical care. Alarm panels shall be local alarms (hard piped), no remote transducers.

Additional valves, over and above that required by NFPA 99, will be provided to allow for adequate service for future additions and renovations.

Terminal Devices – All medical gas and vacuum systems shall be provided with outlets and inlets. Connections whether provided with pin index or DISS (diameter index safety system), will be reviewed with the Facility and HFPA prior to developing the contract documents to assure compatibility with the equipment being used.

11.4.1 Medical Air:

Medical air compressors shall be multiplexed with single receivers. Size the compressors and pumps such that 100% of the peak design load is carried with the largest single unit out of service. Provide a three-way valve bypass at receiver.

11.4.2 Medical Oxygen:

Oxygen shall be connected to the existing bulk oxygen storage tank (LOX), located on the site. The Emergency Oxygen Supply Connection (EOSC) shall be located on the Hospital exterior at the loading dock where a Liquid Tanker will be able to park and supply the facility. Alarm wiring will be installed to an adjacent junction-box to the EOSC for connection to tanker truck alarm wiring.

The oxygen gas piping will be Type K copper tubing conforming to ASME B819 and factory cleaned and capped for oxygen service. Piping will be joined by brazing without the use of flux.

11.4.3 Medical Nitrous Oxide:

The source for the nitrous oxide gas will be a new single-point-connection manifold with a primary and secondary bank of cylinders. The system will be rated at 55 PSI source and a minimum of 50 PSI at the most remote outlet. Nitrous Oxide Manifold (NOM) storage room will be provided with easy access to the outside. Location will be at the loading dock.

The nitrous oxide gas piping will be Type K copper tubing conforming to ASME B819 and factory cleaned and capped for oxygen service. Piping will be joined by brazing without the use of flux.

11.4.4 Medical Nitrogen:

The source for the nitrogen gas will be a new single-point-connection manifold with a primary and secondary bank of cylinders. The system will be rated at 200 PSI source and

a minimum of 190 PSI at the most remote outlet. Nitrogen Manifold storage room will be provided with easy access to the outside. Location will be at the loading dock.

The nitrogen piping will be Type K copper tubing complying with ASTM B819 and factory cleaned and capped for oxygen service. Piping will be joined by brazing without the use of flux.

11.4.5 Medical Vacuum:

The source equipment for the vacuum will be a new single-point-connection vacuum plant located in the Ground Floor mechanical room. The plant will consist of [duplex] [triplex] vacuum pumps, an ASME receiver, and controls. The system will be rated at 19" Hg source vacuum and a minimum of 15" Hg at the most remote inlet.

Provide Claw type pumps which do not require water seal. Medical-surgical vacuum will be provided throughout the facility.

The vacuum piping shall be type K copper tubing conforming to ASME B819 and factory cleaned and capped for oxygen service. Piping will be joined by brazing without the use of flux.

11.5 Specialty Plumbing Fixtures

11.5.1 Dialysis Box:

In the ICU's provide a recessed wall box fabricated of Stainless Steel. Provide stainless steel shut-off valves. Route 2" ductile iron or DWV PVC drain line at least 10'-0 downstream of Dialysis box. Provide backflow protection as required for each connection.

12 (SECTION 12 - NOT USED)

13 FIRE PROTECTION – BED TOWER

13.1 General Requirements

Contractor-originated design documents shall represent a project design that complies with the Request For Proposal (RFP), and the architectural and engineering discipline VA design guidance.

Provide working space around all equipment. Provide concrete pads under all equipment. Provide all required fittings, connections and accessories required for a complete and usable system. All equipment shall be installed per the criteria in the VA Fire Protection Design Manual and the manufacturer's recommendations. Where the word "should" is used in the manufacturer's recommendations, substitute the word "shall".

All Design Documents, (i.e. Building Code/Life Safety Analysis, plans, specifications, and calculations) shall be prepared by, or under the supervision of the design/build contractor's Qualified Fire Protection Engineer, the Fire Protection Designer of Record (FPDOR).

Installation drawings, shop drawings or working plans, calculations, other required pre-construction documentation and as-built drawings shall be prepared by, or under the direct supervision of a NICET engineering technician as specified below. NICET engineering technicians shall hold a current certification as an engineering technician in the field of Fire Protection Engineering Technology with minimum Level III certification in the appropriate subfield. Individuals responsible for work shall hold a Level IV certification in the Special Hazards Suppression Systems subfield.

Prepare a preliminary hydraulic analysis to demonstrate that the anticipated water demand(s), including those for fire, domestic, and industrial needs, will be satisfied by the available water supply. Notify the Contracting Officer immediately if the Design-Build Contractor finds that there is a deficiency related to either water pressure or volumetric water flow rate. Also, develop and submit a graphical analysis of the relationship between the fire suppression demand and the available water supply.

Refer to **Appendix N** for results of fire flow tests.

The Design-Build Contractor shall not further breakdown responsibilities of the FPE DoR among multiple subcontractors, e.g., assigning either the responsibility for life safety to ONLY an architect or the responsibility for fire alarm-fire detection-mass notification to ONLY the electrical engineer is unacceptable.

13.1.1 Codes and Standards: The following is a list of the applicable codes, standards and regulations related to the Plumbing Systems of this project.

- International Fire Code – latest edition as adopted by the State of Florida.
- NFPA 13 – Standard for the Installation of Sprinkler Systems - latest edition.
- NFPA 14 – Standard for the Installation of Standpipe and Hose Systems - latest edition.
- NFPA 20 – Standard for the Installation of Centrifugal Fire Pumps-latest edition.
- NFPA 54 – ANSI Z223.1 National Fuel Gas Code -latest edition.
- NFPA 70 - National Electric Code - latest edition.
- Facility Guidelines Institute - Guidelines for Design and Construction of Health Care Facilities - latest edition.
- NFPA 99 - Standard for Health Care Facilities -latest edition.

13.2 Fire Suppression Water Supply and Equipment

The design point for connection to the existing water supply shall require the approval of the Contracting Officer's Representative. The Fire Protection Designer of Record shall conduct additional flow test after contract award prior to any design submissions. Tests shall be conducted under the supervision of the Contracting Officer's Representative.

The incoming sprinkler service shall be provided with a double check backflow preventer

Provide a freestanding pedestal type fire department connection located no closer than 40 ft from the building and accessible by fire apparatus if not mounted on the building.

Provide horizontal split-case centrifugal electric driven fire pump. The minimum rated capacity shall be determined.

13.2.1 Standpipe Systems: Provide a Class I standpipe system. The building standpipe system and sprinkler system shall be fed from the same supply as a combined system. Residual pressure requirements specified in NFPA 14 must be supplied by a fire pump.

13.2.2 Fire Pump: Electric driven fire pump will be provided for the new building. Pump will be located in its own room with a 1 hour fire separation and be provided with direct access from outside. Pump will be skid mounted and pre-piped complete with a pre-fabricated shed building located on site. The shed building will have heat and air conditioning, ventilation, lighting, telephone conduit and jack, sprinklers, domestic water hose bib, safety shower and electrical distribution.

Fire pump will be in compliance with NFPA 20 and be complete with jockey pump, accessories and controllers.

The fire pump shall be wired to the main fire alarm control panel to provide a signal upon operation of the fire pump.

The automatic electric fire pump installation shall be designed to take suction from the city water supply and to provide a minimum of one hundred (100) psi residual pressure at the roof manifold or highest fire department connection.

The fire pump will be provided with a test header located within 100 feet of a storm water catch basin. An in-line flow meter shall be provided for testing of the fire pump. A pressure relief valve shall be provided to limit discharge pressure to 175 psi. Discharge shall be routed to the exterior.

A detector check valve will be provided after the main shut-off valve on the fire water service to the fire pump to provide backflow protection.

13.2.3 Provide a wet pipe automatic sprinkler system for coverage throughout the facility and integral chilled water plant except at the loading dock where a dry pipe automatic sprinkler system will be required.

For light hazard areas the sprinkler rate of application shall be 0.10 gpm/ft^2 (.38 L/min/m^2), over an area of 1500 ft^2 (232 m^2) with hose stream allowance of 100 gpm (455 L/min).

For ordinary hazard group 1 areas the sprinkler rate of application shall be 0.15 gpm/ft^2 (.38 L/min/m^2), over an area of 1500 ft^2 (232 m^2) with hose stream allowance of 100 gpm (455 L/min).

For ordinary hazard group 2 areas the sprinkler rate of application shall be 0.20 gpm/ft^2 (.38 L/min/m^2), over an area of 1500 ft^2 (232 m^2) with hose stream allowance of 100 gpm (455 L/min).

For extra hazard group 1 areas the sprinkler rate of application shall be 0.30 gpm/ft^2 (.38 L/min/m^2), over an area of 2500 ft^2 (232 m^2) with hose stream allowance of 100 gpm (455 L/min).

For extra hazard group 2 areas the sprinkler rate of application shall be 0.40 gpm/ft^2 (.38 L/min/m^2), over an area of 2500 ft^2 (232 m^2) with hose stream allowance of 100 gpm (455 L/min).

Provide quick-response recessed sprinklers with ordinary temperature rating in areas with finished ceilings. Provide white sprinklers escutcheon plates to match ceiling color.

14 (SECTION 14 – NOT USED)

15 ELECTRICAL BED TOWER

Contractor-originated design documents shall represent a project design that complies with the Request for Proposal (RFP), and the architectural and engineering discipline VA design guidance listed herein.

System Description

This project includes the construction of the new Bed Tower at the VAMC, Tampa, Florida. It also includes the demolition and renovation of existing Hospital and USF Pedestrian Bridge areas necessary for the new construction as well as modifications to the existing Electrical Generator Plant (Power Plant) Refer to site plans in Appendix for building locations.

Due to the new electrical loads created from the integral chilled water plant and new Bed Tower, one (1) new 2 MW generator shall be installed in the existing Power Plant. This should provide the VA with full campus back up capacity with an N+1 system while maintaining a minimum of 600 kW "spinning reserve" resulting in a total of 13.4 MW of generator back-up capacity. The new generator shall be located in the eighth (and final) open generator bay in the Power Plant.

SCADA shall be updated to reflect the new generator capacity.

The VA has indicated the system has currently nine (9) days of diesel fuel capacity and requests no additional diesel storage. Connect the new generator to the existing fuel system and make all modifications and additions as needed. The new system shall be tested when completed.

TECO serves the campus with four (4) 13.2 kV circuits and includes "flip-flop" relay switchgear, meaning the campus is fed by (2) 13.2 kV circuits at any given time. Each 13.2 kV circuit has a design load of approximately 6 MW but TECO indicates that each circuit can pick up 12 MW in an emergency. Therefore, no additional TECO capacity is anticipated. Metering is not anticipated to change.

Tampa Electric will be able to accommodate the additional load anticipated by the Bed Tower and expansion of the Chiller Plant in the timeframe indicated (2019).

Communication with TECO to the RFP-AE in 2015:

"Discussions and planning considerations for this project should include the existing load profile of the hospital (averaging 6-7MW), the diversified load of the South Bed Tower (possibly less than 2MW), available capacity on our existing circuits, and Tampa Electric's "Interconnection Agreement for Non Export Parallel Operators" with the hospital. None of which affects Tampa Electric's ability to

accommodate the Bed Tower's additional load. However, these items could influence how Tampa Electric serves the additional load."

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Provide an interior electrical system consisting of Service Entrance Wiring and Equipment, Distribution, Lighting and Branch Circuit Panelboards, Dry Type Transformers, Conduits, Feeder and Branch Circuits, Motor Control Equipment, Lighting and Branch Wiring, Communications, Nurse Call, Security and Fire Alarm Systems, Emergency Lighting and Power, Grounding, Lightning Protection, including accessories and devices as necessary and required for a complete and usable system. All electrical systems shall be designed and installed to be in compliance with the VA Electrical Design Manual (for New Hospitals).

The building shall have two sets of dual, normal utility service feeders and one set of dual emergency (essential systems) utility service feeders. One set of dual, normal utility service feeders shall feed Bed Tower load. The other set of dual, normal utility service feeders shall feed the integral chilled water plant loads and other Bed Tower mechanical loads.

Select electrical characteristics of the power system to provide a safe, efficient and economical distribution of power based upon the size and types of electrical loads to be served. Use distribution and utilization voltages of the highest level that is practical for the load to be served.

Provide a minimum of 25% spare circuit and load capacity at all levels of the power distribution system including any stand-by power systems. The electrical system shall be designed to accommodate a 2 story vertical expansion in accordance with VHA Program Guide PG-18-3.

The interior distribution system shall consist of insulated conductors in conduit.

Refer to **Appendices R and S** for additional information regarding existing electrical systems and proposed enhancements.

General System Requirements

Provide an Electrical System complete in place, tested and approved, as specified throughout this RFP, as needed for a complete, usable and proper installation. All equipment shall be installed per the criteria described herein and the manufacturer's recommendations. Where the word "should" is used in the manufacturer's recommendations, substitute the word "shall".

Sustainability

Provide electrical systems and components that support project sustainability and energy goals in conformance with the VA Sustainable Design Manual. The new South Bed Tower is targeted to meet all the requirements per Section 20, *Sustainable Design* and to the LEED Project Scorecard for credits targeted to be obtained which impact the electrical systems design.

Antiterrorism

Provide electrical systems to be in conformance with the Anti Terrorist Force Protection (ATFP)

requirements of the VA Physical Security Design Manual.

Seismic Bracing

Bracing of electrical equipment to resist seismic events is not required based on site seismic design criteria and building importance factor.

Electrical Testing

New electrical equipment shall be tested in accordance with NETA acceptance testing specifications. Existing electrical equipment remaining in service shall be tested in accordance with NETA maintenance testing specifications.

Commissioning

Commission all systems in accordance with the Whole Building Commissioning Process Manual. See Section 21 for additional information.

Electrical Design Guidance

Provide the design and installation in accordance with, but not limited to, the following Government references and standards:

VA Design Manuals:

- Electrical Design Manual
- Fire Protection Design Manual
- Sustainable Design Manual

VA Specifications:

• 26 05 11	Requirements for Electrical Installations
• 26 05 13	Medium-Voltage Cables
• 26 05 19	Low-Voltage Electrical Power Conductors and Cables
• 26 05 26	Grounding and Bonding for Electrical Systems
• 26 05 33	Raceways and Boxes for Electrical Systems
• 26 05 36	Wireways for Radiology Equipment
• 26 05 39	Underfloor Raceways for Electrical Systems
• 26 05 41	Underground Electrical Construction
• 26 05 73	Overcurrent Protective Device Coordination Study

- 26 08 00 Commissioning of Electrical Systems
- 26 09 23 Lighting Controls
- 26 11 16 Secondary Unit Substations
- 26 13 16 Medium-Voltage Fusible Interrupter Switches
- 26 22 00 Low Voltage Transformers
- 26 23 00 Low Voltage Switchgear
- 26 24 13 Distribution Switchboards
- 26 24 16 Panelboards
- 26 24 19 Motor Control Centers
- 26 25 11 Busways
- 26 27 26 Wiring Devices
- 26 29 11 Motor Controllers
- 26 29 21 Enclosed Switches and Circuit Breakers
- 26 32 13 Engine Generators
- 26 33 53 Static Uninterruptible Power Supply (UPS)
- 26 36 23 Automatic Transfer Switches
- 26 41 00 Facility Lightning Protection
- 26 42 00 Cathodic Protection
- 26 43 13 Surge Protective Devices
- 26 51 00 Interior Lighting
- 26 56 00 Exterior Lighting
- 27 51 16 Public Address and Mass Notification System
- 28 31 00 Fire Detection and Alarm

Design Submittals shall be in accordance with Specification Section 01 33 23, *Shop Drawings, Product Data, and Samples*.

Specification sections listed above are to be used by the Designer of Record (DOR) as a part of the

design submittal. If the specified products or systems are applicable to the project, the DOR shall edit these referenced Specification sections and submit them as a part of the design submittal specification.

The ensuing parts of this section add clarification to the fundamental requirements contained in the Government references and standards listed above.

15.1 Exterior Electrical System

The site electrical utility system consists of all power and telecommunications and fiber optic cabling from the existing distribution system point of connection including all connections, accessories and devices as necessary and required for a complete and usable system.

Provide exterior equipment designed for coastal and high humidity areas.

The following suggested service entrance scheme is based on an integral chilled water plant servicing the new Bed Tower:

Connect to the existing campus 13.2kV, three phase, 60 Hertz "Normal" electrical power systems shall be at the spare fuse switches in "N1B2" and "N2B2" and extended to the project site underground in ductbank to a Secondary Unit Substation in the new Bed Tower.

The connection point for the integral chilled water plant loads shall be at the spare fused switches in "N1B1" and "N2B1" located to the west of Building #53 and extended to the project site underground in ductbank to a Secondary Unit Substation in the new Bed Tower.

The connection point for the "Essential" electrical power systems shall be at the spare fused switches in "E1A2" and "E2A2" and extended to the project site underground in ductbank to a Secondary Unit Substation in the new Bed Tower.

This will result in two (2) separate (fully redundant) 13.2 kV feeders serving all loads in the new facility.

15.1.1 Underground Electric Conductors

Provide a medium voltage underground electrical power distribution systems to meet the connection requirements as indicated above. Route underground cables to minimize splices. Cable pulling tensions shall not exceed the maximum pulling tension recommended by the cable manufacturer. Medium voltage cable termination shall be suitable for the location installed and meet IEEE Std. 48 Class 1 requirements.

15.1.2 Ductbanks, Manholes, Handholes and Raceways

Provide a system of concrete encased ductbanks, handholes and manholes for all underground power wiring to include all 13.2kV and SCADA. Match campus standard. Concrete manholes and handholes shall be standard type pre-cast concrete. Load ratings of manholes and handholes shall be suitable for the location installed.

15.1.3 Site Lighting

Provide site lighting for exterior including underground distribution, handholes, grounding, poles, fixtures and controls as required for a complete and usable system.

15.1.3.1 Exterior Lighting Fixtures and Controls

Provide Area (walkway and facility entrances/exits) and Parking lighting fixtures, complete with lamps. Exterior Lighting shall be coordinated with physical security, CCTV and landscaping requirements. Provide lighting control for exterior lighting fixtures with individual photocell switches on each luminaire.

Where required, implement obstruction lighting by the latest edition of Federal Aviation Administration (F.A.A) Advisory Circular AC 70/7460-1K.

Consider the use of LED lighting sources for exterior lighting, except where lighting is required to match an existing source.

Comply with ANSI/ASHRAE/IES 90.1 for all exterior lighting applications and controls.

Provide SPD at panelboards that include circuits feeding exterior lighting systems.

Coordinate the design and luminaire selection with the landscape designer. Such coordination should include the location of poles which may conflict with tree locations.

15.1.3.2 Lighting Poles

Provide poles for site lighting. Poles shall be no higher than 40ft.

Poles shall meet Uniform Building Code for street lighting poles. Poles shall be direct set or anchor-base type designed for use with underground supply conductors.

15.2 Interior Electrical System

15.2.1 Power

Refer to the proposed One Line Diagram in Appendix for reference for the following power distribution description.

15.2.1.1 Main Transformers

Main transformer(s) are included in the secondary unit substation as defined in Section 15.2.1.2, *Service Entrance Equipment.*

15.2.1.2 Service Entrance Equipment

The electrical service to the facility shall be primary selective, secondary radial topology. All service into the facility shall be underground in concrete encased duct bank.

Provide secondary unit substations as service entrance equipment. Provide the substations with an incoming high voltage switch coupled to a transformer and low voltage distribution switchgear section. Circuit protective devices shall be electrically operated, draw-out type circuit breakers with electronic relays.

Provide power monitoring and metering for both normal and essential electrical systems. Provide connection of the power monitoring and metering system to the BAS/DDC system.

15.2.1.3 Emergency Power (Essential Electrical System)

The Essential Electrical System for the new Bed Tower shall comply with the Type 1 System as developed by NFPA 99. The essential power shall be served from the existing emergency power distribution infrastructure on the campus Primary distribution will be dual, radial feeders to serve the essential power unit substations in the Bed Tower. The substations supplying Critical, Life Safety or Essential Equipment branch loads will be primary selective to allow all transformers to be selectively served from alternate primary circuits in the event of a failure. The essential power supply system substation, switchgear, and distribution boards shall be located in a separate room from the normal distribution equipment. This separate room walls shall be fire rated for 1-hour fire-resistance-fire barriers. All equipment, conduit, piping, ductwork, etc., alien to the essential systems shall not be located within these rooms. The building essential power floor distribution system shall consist of:

- 480/277V Switchboards
- 480/277V Distribution Boards
- 480/277V Branch Circuit Panelboards to serve lighting loads and distribute to step-down dry type transformers
- 120/208V Branch Circuit Panelboards via step-down dry type transformers

Essential systems for the facility will be provided based on occupancy and shall be subdivided in the code required branches as listed below:

- Life Safety Branch
- Critical Branch
- Equipment Branch

Provide automatic transfer switches and distribution switchboards are required to distribute the load of the essential systems. All wiring from each of the essential branches, shall be kept completely separate from each other such as raceways, pull boxes, etc. except where allowed by code. Provide connections to the campus SCADA system.

Provide UPS power for the IRM (Telecommunications equipment) and Security System Equipment as defined by the VA. The UPS system shall provide 15 minutes of emergency power to allow startup and connection of the essential power from the emergency generators in the Power Plant.

15.2.1.4 Interior Distribution Transformers

Provide dry type transformers to step down secondary voltages for general purpose outlets and other low voltage equipment.

15.2.1.5 Panelboards and Switchboards

Provide distribution and branch circuit panelboards and switchboards to serve loads as required. Panelboards and switchboards shall be installed in electrical rooms or closets.

Panelboards shall comply with UL 67 and UL 50. UL 869A shall apply if used as service entrance equipment. Panelboards for non-linear loads shall be UL listed, including heat rise tested, in accordance with UL 67, except with the neutral assembly installed and carrying 200 percent of the phase bus current during testing.

Provide molded case circuit breakers in accordance with UL 489. Ground fault circuit interrupting circuit breakers shall comply with UL 943. Arc fault circuit breakers shall comply with UL 489 and UL 1699.

15.2.1.6 Enclosed Circuit Breakers and Safety Switches

Provide enclosed circuit breakers or safety switches for all equipment as required by NFPA 70.

Provide molded case circuit breakers in accordance with UL 489. UL 869A shall apply if used as service entrance equipment. Provide with solid neutral when grounded conductor is present.

15.2.1.7 Wiring and Devices

Provide electrical connections for all systems requiring electrical service. Provide general purpose receptacles throughout all spaces as required. General purpose receptacles are typically provided on each wall of a room or a space where power is required. Refer to VA Guide Plates. Dedicated duplex or special receptacles are provided for selected pieces of equipment such as refrigerators and hospital equipment. Workstations with personal computers (PC's) are typically provided with quadruplex receptacles for the PC, monitor and printer. Provide junction boxes for equipment requiring hardwired connection.

Switches shall comply with NEMA WD-1 and UL 20.

All branch wiring shall be insulated conductors in conduit. All homerun circuits must contain no more than 3 phase conductors.

15.2.1.8 Motor Control Centers

Provide motor control centers, individual motor starters with disconnect switches, combination motor starters, variable speed drives and manual motor starters for motor controls as required by mechanical equipment. Provide all circuits and connections for motors as required.

Motor control centers shall comply with UL 845, NEMA ICS 2, and NEMA ICS 3. Motor controllers shall comply with UL 508. Provide disconnecting means capable of being locked out for machines and other equipment to prevent unexpected startup or release of stored energy in accordance with 29 CFR

1910.147.

When Variable Frequency Drives are required, the Designer of Record shall utilize specification Section 26 29 11 for the project specification, and shall submit the edited specification section as a part of the design submittal for the project.

15.2.1.9 Other Service and Distribution

An integrated, cascaded surge protection system shall be provided: at the service entrance level and at downstream panelboards that serve sensitive electronic equipment.

Provide a complete system of plug-in busway risers, including bus plugs, to serve electrical distribution equipment in stacked electrical rooms.

Busway shall be copper and comply with NEMA BU 1 and UL 857.

15.2.2 Lighting

15.2.2.1 Lighting Equipment

A complete and functional lighting system shall be provided and installed for the facility consisting of exit and emergency lighting and area lighting consisting of LED and fluorescent lighting including switches and automatic controls including occupancy sensors, vacancy sensors, daylighting controls, and automatic lighting shutoff systems. The design of interior lighting and associated lighting levels shall be in accordance with the latest edition of the VA Lighting Design Manual and IES guidelines. Lighting shall be provided for all spaces. Lighting calculations for each area shall utilize data from the actual fixture to be used. The engineer designing the lighting system shall maintain uniformity ratios equal to or better than that recommended by the I.E.S. standards. Mercury vapor and incandescent lighting shall not be used.

Illumination is typically provided utilizing recessed fluorescent luminaries with acrylic prismatic lenses. Recessed fluorescent fixtures with parabolic louvers may be used at the nurse/communication station or offices to control glare on monitor screens. Under shelf fluorescent down lights may be provided above the counter work surface for task lighting. The fixtures typically use F32T8 lamps in compliance with the Energy Policy Act (EPACT 2005). Low mercury fluorescent lamps should be used. The Environmental Protection Agency (EPA) has established a maximum mercury concentration level. Fluorescent lamps that meet the EPA criteria are known as Toxicity Characteristic Leaching Procedure (TCLP) compliant. Attention needs to be given to illumination as a function of reflectance off walls and ceilings, particularly with color applied, to ensure lighting levels comply with criteria.

The lighting systems shall comply with Federal energy policy, the VA Energy Conservation Policy, and Sustainable Design and Energy Reduction Manual. Lighting intensities shall conform to the VA design criteria, the IES Lighting Handbook and IES publication RP-29-06, "Lighting for Hospitals and Health Care Facilities". If necessary to meet Sustainable Design and Energy Reduction requirements, LED lighting may be considered. Reducing patient

illumination levels below established levels is not recommended.

Lighting energy consumption can be reduced in several ways such as reducing lighting fixture count, using highly efficient fixtures including LED, managing when lighting is used and the amount of illumination delivered, using task lighting, and selecting fixtures, lamps, and controls that best meet the needs of the staff and patient occupants. Fluorescent lamp lumen output can be increased by raising the CRI level without increasing lamp wattage. Specific methods may be used to reduce energy consumption including using occupancy sensors, time-clocks, photocells, daylight dimming, building-wide lighting control systems and using fluorescent dimming. Lighting is typically controlled by wall mounted switches located at the entrance to the room. Larger spaces may utilize multiple switching by separate switches for lighting of individual zones or areas. Use wet location light fixtures due to the high moisture and humidity of rooms with showers or tubs for bathing.

Lighting load densities should be verified for the actual design, as they may vary depending on the room configuration, fixture types, lamps and ballasts used. Serve selected light fixtures from the critical branch of the emergency power system to allow for continued operation during a power outage.

15.3 Lightning Protection

Provide a complete lightning protection system with a UL Lightning Protection Inspection Certificate certified to UL 96A, including, but not necessarily limited to, strike termination devices, conductors, ground terminals, interconnecting conductors, surge protective devices, and other connectors and fittings required for a complete and usable system.

Install the down conductors within the concealed cavity of exterior walls.

Lightning Protection Systems shall not void the roof warranty.

15.4 Grounding

Provide a complete grounding system for the facility electrical and telecommunications systems.

15.5 Fire Alarm and Mass Notification

15.5.1 System Description

Provide a fire alarm and mass notification system, integrated with the facility fire suppression system, capable of notifying building occupants.

All Design Documents, (i.e. Building Code/Life Safety Analysis, plans, specifications, and calculations) developed for this section shall be prepared by, or under the supervision of the design/build contractor's Qualified Fire Protection Engineer, the Fire Protection Designer of Record (FPDOR).

Installation drawings, shop drawings or working plans, calculations, other required pre-construction documentation and as-built drawings shall be prepared by, or under the direct supervision of a NICET engineering technician. NICET engineering technicians shall hold a current certification as an engineering technician in the field of Fire Protection Engineering Technology with minimum Level III certification in the appropriate subfield.

Provide a riser diagram for fire alarm-fire detection-mass notification (FAFDMN) that graphically represents all initiating devices and indicating appliances.

15.5.2 Fire Alarm and Detection System

The Basis of Design for the fire alarm system shall be Simplex to match the existing fire alarm system equipment presently in service at the VA Tampa facility. Other manufacturers will only be considered upon approval from the Government prior to bid.

Provide automatic fire alarm-fire detection-mass notification as required by VA Fire Protection Design Manual (or VA FPDM) and VA Handbook PG-18-15. The design and installation of each feature for fire alarm-fire detection-mass notification (FAFDMN), including all new equipment, devices, appliances, wiring and conduit, shall conform to the aforementioned manual and handbook from Department of Veterans Affairs, as well as any other requirements contained within this RFP. The integrated fire alarm and mass notification systems shall be capable of notifying building occupants inside the facility. Provide a complete, electrically supervised, addressable intelligent, manual and automatic, annunciated fire alarm and detection system throughout the facility. The system shall be a voice evacuation type system and shall also serve as a mass notification system. These integrated systems shall be capable of notifying building occupants by means of tones, strobes, textural messaging, prerecorded and live voice announcements. The fire reporting portion of the system shall be compatible with the existing base fire reporting system. The fire alarm system shall include manual stations, system smoke detectors, duct smoke detectors, line voltage single-station smoke detectors, heat detectors, audio/visual alarms, electrical supervision of all sprinkler system alarm and supervisory devices, and electrical supervision of fire pump controllers. The Fire Alarm system shall be networked with the existing system. Provide all conduit and wiring, underground structures, termination equipment, etc. as required for networking the Fire Alarm system with the existing system. Modify the existing campus system as necessary to accommodate the addition of the new Bed Tower system.

The fire alarm control panel shall be capable of handling the required number of individually identified sensors within the main control panel. Provide Notification Appliance Circuits, Class B Signaling Line Circuits, and Class B Initiation Device Circuits. Provide back-up amplifiers for combination fire alarm/mass notification systems.

Manual pull stations shall be surface mounted.

Provide a remote annunciator. Remote annunciators shall have a minimum 80 character alphanumeric display with alarm acknowledge, alarm silence, and reset functions.

Provide the following signals to be sent to the fire alarm receiving station:

a. Sprinkler Water Flow
b. Smoke Detector
c. Manual Pull Station
d. Supervisory (i.e., valve tamper switch, fire pump loss of power, fire pump phase reversal)
e. Duct Smoke Detector
f. Fire Pump Running
g. Sleeping Room Smoke Detector

15.6 Other Systems

15.6.1 Energy Management Control System

Provide power wiring and connections as required for all systems and equipment including normal and essential electrical systems. Coordinate connection requirements with existing power monitoring systems at the VA Tampa Hospital.

15.6.2 Communications, Nurse Call and Security Systems

These systems are described in Section 16 and 17 below.

16 SECURITY SYSTEMS – BED TOWER AND UTILITY PLANT

16.1 Stipulations

16.1.1 The Room Requirements Section identifies locations for communications and security systems and equipment, unless noted otherwise in the following sub-elements.

16.1.2 The Contractor is responsible for actual equipment/device counts whether shown or implied. Equipment/device locations indicated on the drawings must be verified to achieve the Owner's expectations for a complete communications and security system in accordance with Unified Facility Code requirements.

16.2 Reference Documents

16.2.1 The following documents form a part of this section by this reference thereto and shall have the same force and effect as if printed herewith in full. All Contractors for this work shall have read all sections and other reference sections in the execution of all work and will be bound by all conditions and requirements therein.

- Physical Security Design Manual (PSDM) for Mission Critical Facilities, version 2015, modified to reflect the existing conditions for this facility.
- Physical Security Design Manual for Mission Critical Facilities, PSDM Appendix A.
- Physical Security Design Manual for Mission Critical Facilities, PSDM Appendix B.
- Refer to this RFP's **Appendix D** for the above three documents.

- VA Handbook 0730/4 -Security and Law Enforcement, version March 29 2013 – Appendix D.
- VA Master Construction Specifications (PG-18-1)
  - Section 28 05 00 – Common Work Results for Electronic Safety and Security.
  - Section 28 05 28.33 – Conduits and Boxes for Electronic Safety and Security.
  - Section 28 13 00 – Physical Access Control Systems (PACS).
  - Section 28 13 16 – Physical Access Control System and Database Management.
  - Section 28 16 00 – Intrusion Detection System (IDS).
  - Section 28 20 02 – Anti-Wandering System.
  - Section 28 23 00 – Video Surveillance.
  - Section 28 26 00 – Electronic Personal Protection System.
- Sections of other trades included in the Contract Documents to ensure proper coordination.

16.3 General

16.3.1 Security Design of the facility is of critical importance to insure the safety and the security of the veterans, staff and visitors alike. Security design encompasses not only the door access control systems and closed circuit television monitoring of a facility, but also

passive security features and clear way finding integrated into the overall building and site design.

16.3.2 The system shall include including dedicated, concealed, security conduit and wiring, termination equipment, enclosures and grounding systems as required for a complete and usable system in compliance with the following PG18-1 Sections:

- 28 05 00
- 28 05 13
- 28 05 26
- 28 05 28

16.4 Facility Type

16.4.1 The new South Bed Tower is considered to be a Mission Critical type facility. The design shall be in compliance with the Physical Security Design Manual for Mission Critical Facilities, version 2015, modified to reflect the existing conditions for this facility, as well as the VA Handbook 0730/4 -Security and Law Enforcement, version March 29 2013 (APPENDIX D).

16.5 Electronic Security System (ESS)

16.5.1 Provide an integrated Electronic Security System (ESS) for the new South Bed Tower, as well as the existing Emergency Department Entrance and USF Pedestrian Bridge connection, that encompasses the following subsystems; Physical Access Control System (PACS), Intrusion Detection System (IDS), Anti-Wandering System, Personal Protection System, Emergency Assistance Communication System (EACS) / Intercommunications System (ICS), and Video Assessment and Surveillance System (VASS) systems for assessment of alarm conditions. The systems shall be in compliance with the following PG18-1 Sections:

- 28 05 00
- 28 13 00
- 28 13 16
- 28 16 00
- 28 20 02
- 28 23 00
- 28 26 00

16.5.2 A new security server/video storage room shall be established in the Bed Tower to allow monitoring in a new Security Control Center (SCC). The existing Dispatch Room shall serve as a backup in the event of an interruption in monitoring at the new SCC. The systems shall be compatible with the existing James A Haley Veterans' Hospital VASS system, as well as the central monitoring system Tyco Software House CCure 9000 ESS security equipment. The ICS system shall also be compatible with the existing system.

16.5.3 The ESS for this project shall meet requirements of VA Handbook 0730 and the VA Physical Security Design Manual for Mission Critical Facilities – 2015. Security Engineering and Electronic Security Systems shall consist of system sensors, credential readers, intercommunications, and video surveillance cameras, located in areas in accordance with the VA Handbook 0730, Physical Security Requirements and Options table (Appendix B), the VA Physical Security Design Manual for Mission Critical Facilities - 2015, Matrices in the appendices, and other VA related documents utilized in this project. The Contractor-originated design documents shall represent a project design that complies with the Request For Proposal (RFP), and the architectural and

engineering discipline VA design guidance listed, stated in Part 2 section 01 33 10.05 20, paragraph 1. 3. The documents described in this paragraph shall be identified as the governing documents.

16.5.4 Access to the Bed Tower from the overhead walkway will be monitored and controlled through the PACS. Readers can be enabled or bypassed through programming of the PACS system. Cameras shall monitor the passage, as well as the entrance on both sides of the opening.

16.5.5 Provide HSPD12, FIPS 201.2 compliant PACS equipment, utilizing credential readers and biometric devices to monitor and control personnel movement into the protected areas of the building. The PACS shall log and archive all transactions and alert authorities of unauthorized entry attempts. PACS shall be interfaced with the VASS system to assist security personnel in the assessment of unauthorized entry attempts. The use of a valid card shall signal the system to momentarily ignore the door opening, and allow access without initiating a door alarm. Integral request to exit switches internal to the door hardware shall perform the same function when exiting the area.

16.5.6 Provide a separate security network to accommodate all security equipment communications. Head-End equipment server, workstations and controllers shall be connected by a high-speed electronic data transmission 1 Gig Ethernet network. The network shall be configured for scalability, to provide traffic separation between layers, and to reduce CPU utilization. Furnish hardware dual redundancy for all power supplies, and cooling fans utilized by the Ethernet Network Equipment. All copper cabling shall be CAT-6. All fiber optic cable not furnished by Division 27 shall be 50/125-micrometer, nonconductive, tight buffer, using LC type connectors.

16.5.7 Secure Areas

Provide an IDS to detect attempts or access by unauthorized personnel into protected areas such as vaults, pharmacy work areas, as well as other areas required by the governing documents. The Premise Control Units (PCU), as part of the IDS, shall allow independent arming and disarming of those areas. Arming and disarming shall occur with a key in lieu of separate codes. Provide point sensors on all doors, and man-passable openings. Provide volumetric sensors such as glass break sensors to detect glass breakage, as well as motion sensors to detect movement within secure/protected areas. The system shall annunciate and archive all alarm conditions, including duress alarms, within the protected area and at the central monitoring station within the SCC. System sensors and the premise control units (PCU) shall be located within the protected area. The system shall be configured to only allow cleared personnel located within the protected area to initiate changes in access modes or alarm conditions. The intrusion detection equipment shall be in compliance with PG18-1 Section 28 16 00.

16.5.8 Provide duress alarms at all reception desks, as well as other areas identified in the governing documents. Duress alarm shall initiate an alarm condition at the security monitoring screen in the SCC. Operation of duress alarm shall not result in an audible or visual signal in the protected area. A duress alarm event shall trigger an associated camera to be automatically displayed at the video monitor in the SCC. Duress alarm equipment shall be in compliance with PG18-1 Section 28 26 00.

16.5.9 Emergency exit doors shall be alarmed 24 hours per day. Alarm condition shall result in an audible annunciation that alerts occupants within the protected area of an attempted egress. Provide an interior and exterior VASS system for visual assessment and archiving of all perimeter doors and alarm conditions for the facility.

Features shall include interface to ESS for control of camera call-up to video monitors, pan-tilt-zoom camera control, and digital video archiving.

16.6 Video Assessment and Surveillance System (VASS)

Interior cameras shall be color. The majority of the cameras shall be fixed position type to provide overall coverage of an area, however pan, tilt, and zoom cameras shall be utilized where appropriate to track individuals, identify details in the video scene, and to allow one camera to pan/tilt/zoom to multiple locations in the area. Interior cameras shall be placed to view the main lobby area, public and staff corridors, reception areas, entrances to staff spaces, entrances to utility spaces, waiting areas, nurses' stations, elevator lobbies, receiving area, pharmacy area, pharmacy vault entrance and pharmacy controlled substance storage, as well as other areas identified in the governing documents. Exterior roof mounted cameras shall be Pan/Tilt/Zoom (PTZ). All interior and exterior video cameras shall be digitally recorded on site for review and archiving purposes. The Physical Security Design Manual requires the use of Moving Picture Experts Group (MPEG) type compression, therefore the system shall be designed using the current MPEG type compression - H.264. Cameras shall be recorded at 1280x1024 resolution at 7 frames per second (fps) under normal conditions, but increase to 30 fps when the camera detects motion in its field of view, or when a local alarm is generated. Programming shall allow the camera fps to decrease when the building is unoccupied to 1-2 fps to conserve recording space. Video shall be stored for 90 days. The VASS shall be monitored from the SCC. Images associated with an event (i.e. intercom calls, duress and intrusion detection) shall be displayed full screen on the "event monitors" quadrant of the video monitoring screen for easy assessment. VASS equipment shall be in compliance with PG18-1 Section 28 23 00.

16.7 Intercommunications

16.7.1 Two intercom systems shall be provided for the facility.

The main system shall be compatible with the existing telecommunications system and allow audio communication between remote stations at the main entrances, vehicle entrances and parking area blue light assistance stations, as well as other areas defined in the governing document, to the master station in the SCC. The system shall be interfaced to the video camera system to allow automatic call up of activity in the affected area. Pan, tilt and zoom cameras shall automatically zoom to the alarm origination location.

Individual video intercom systems shall be provided at staff entry locations to allow point-to-point communications between the entrance and the designated station within the area. The system shall allow staff to view individuals requesting access and allow remote unlocking of the door. The system shall be interfaced to the PACS to signal the system to momentarily ignore the door opening and prevent generating an alarm, thereby allowing the door to be armed 24/7.

16.7.2 Integration with the PACS and VASS shall provide a means to associate achieved alarm events with recorded video at the event location(s).

16.8 Security System Integration

16.8.1 All security related systems for the new facility shall be integrated into the existing security monitoring systems, the physical access control system and the video surveillance system. The physical access control system to be utilized by the facility shall be the ESS, monitored at the security monitory screens in the SCC. Video surveillance, building intrusion sensors, duress alarms, and intercom substations shall interface with the two systems to provide seamless monitoring and operation of all devices at the control station in the SCC.

16.8.2 Alarms and events shall display on graphic maps, identifying the affected areas on the floor or site plan. Provide all programming associated with the creation of the graphic maps.

16.9 Operations Room/Security Control Center (SCC)

16.9.1 All security related systems for the new facility shall be monitored at the security monitoring screens in the SCC. The equipment in the SCC shall be designed to serve two staff positions. Both workstations shall perform the same function to monitor the security and video for the facility. Four monitors are required at each station to display video and alarm events, as well as graphic map displays of the affected areas on the floor or site plan. An activity/report printer shall also reside in this room.

16.10 Security Systems Power

16.10.1 Security equipment shall be powered by emergency generator circuits, with the exception of the security equipment in parking areas. Supplemental UPS power for the security equipment shall be provided by the VA.

16.10.2 Provide 24 hours of emergency uninterruptable backup power. Backup power may be provided by batteries, uninterruptable power supply, generators, or combination thereof.

16.11 Site

16.11.1 Provide a site security communication fiber optic network to interface the existing Video Assessment and Surveillance System (VASS) and Tyco Software House CCure 9000 system to the new security systems in the South Bed Tower and CUP building.

16.11.2 Provide fiber optic communications to all exterior devices to provide isolation to building equipment from lightning and electrical surges.

16.11.3 Provide equipment to monitor and control the emergency vehicle/delivery access to the Emergency Department and Loading Dock. The equipment shall include, but not be limited to, Voice and Data Telecommunications Systems, Cable Television (CATV) Systems, Electronic Security Systems and cameras. The system shall include including all conduit and wiring, underground structures, termination equipment, poles and structures, and grounding systems as required for a complete and usable system.

16.11.4 Provide cameras to view the all parking, loading dock/emergency entrance driveways, Bed Tower and CUP areas. Exterior cameras shall be located at the all primary access doors and patient drop-off and as described in the governing documents, in conjunction with the emergency/blue light assistance stanchions located throughout the surface parking areas. The security staff will monitor the CCTV system from the SCC, and the equipment will be recorded by the VASS. The majority of the video cameras will be fixed position, however Pan/Tilt/Zoom (PTZ) cameras shall be located in parking and driveway areas, as well as other areas outlined in the governing documents. The system shall allow cameras to automatically PTZ to areas where events are occurring (i.e. emergency blue light station calls, duress and intrusion detection), and allow security personnel to track individuals or vehicles.

16.11.5 Exterior cameras shall be high-resolution color cameras that automatically change to black and white in low light conditions. Exterior lighting shall be programmable to allow nighttime illumination as needed.

16.12 Emergency Vehicle/Loading Dock Access

16.12.1 The driveway entrance to the emergency department and loading dock shall be restricted using a motorized gate arm, opened upon use of a valid credential. The driveway entrance shall be restricted to deliveries, authorized staff, police and medical only. A pedestal mounted intercom station shall be located at the entrance to allow delivery vehicle drivers to communicate to personnel within the building, as well as card access for authorized individuals accessing the emergency department and loading dock. Cameras shall be located to monitor these areas from the SCC.

16.13 Emergency Blue Light Station

16.13.1 Provide Blue Light Assistance Stations at locations identified in the governing documents. The audio equipment shall be compatible and communicate with the existing ICS through the existing telecommunications system. Provide additional communications lines to the new equipment. Pressing the call button shall initiate a call to the SCC. A recorded message identifying the location shall be announced to the Dispatch Operator prior to establishing voice communications. The call button shall also interface to the PACS system to alert Dispatch personnel of the exact location on a graphic site plan, and interface to the existing VASS system to provide automatic camera video of the location. The emergency blue light station equipment shall be in compliance with PG18-1 Section 28 26 00.

17 COMMUNICATIONS

The System Requirements Section identifies locations for communications equipment, unless noted otherwise in the following sub-elements. Additional requirements for communications systems are located in the PTS documents.

The Contractor is responsible for actual equipment/device counts whether shown or implied. Equipment/device locations indicated on the drawings must be verified to achieve the Owner's expectations for a complete communications and security system in accordance with Unified Facility Code Requirements.

17.1 Reference Documents

The following documents form a part of this section by this reference thereto and shall have the same force and effect as if printed herewith in full. All Contractors for this work shall have read all sections and other referenced sections in the execution of all work and will be bound by all conditions and requirements therein.

a. All communications work shall be performed in accordance with all requirements listed in Part 2 Design Requirements

b. VA Telecommunications and Special Telecommunications Systems Design Manual February 2016.

c. VA Master Construction Specifications (PG-18-1)

- Section 27 05 11 – Requirements For Communications Installations
- Section 27 05 26 - Grounding And Bonding For Communications Systems
- Section 27 05 33 - Raceways And Boxes For Communications Systems
- Section 27 11 00 - Telecommunications Room Fittings
- Section 27 15 00 - Communications Structured Cabling
- Section 27 32 41 - Two-Way Radio Equipment And Systems
- Section 27 41 31 - Master Antenna Television Equipment And Systems
- Section 27 51 16 - Public Address And Mass Notification Systems

- Section 27 51 23 - Intercommunications And Program Systems
- Section 27 52 23 - Nurse Call And Code Blue Systems

17.2 General System Requirements

17.2.1 Communications Requirements

a. All new active and passive commination's equipment provided for this project shall be fully compatible with existing systems currently in place on this facility. This includes hardware and software to ensure that new and existing systems remain fully functional and maintain any warranties.

17.2.2 Contractor Qualifications

a. All telecommunications work associated with this project shall be performed by a contractor which is regularly and professionally engaged in the business of the applications, installation, and testing of the specified telecommunications systems and equipment.
b. Provide Registered Communications Distribution Designer (RCDD) stamped approved, drawings and specifications in accordance with TIA/EIA. The Prime Contractor and/or Electrical Contractor shall have said RCDD as a full time dedicated resident staff member.
c. At a minimum all on-site communications work shall be supervised by a lead with current Building Industry Consulting Services International (BICSI) Registered Technician certification.
d. Communications contractor shall be certified by factory from each equipment manufacturer provided under communications indicating that they are qualified to install, test and warrant the provided products.

17.2.3 Warranties

a. Contractor shall be factory certified and authorized to provide factory warranty or extended warranty for each system included.
b. Contractor shall ensure that any new work performed as part of this project shall not affect any existing warranties currently in place throughout the facility.

17.3 Site Communications

17.3.1 Provide a site communication system including, but not necessarily limited to, Voice and Data Telecommunications Infrastructure Systems and Cable Television (CATV) Systems, including all conduit and wiring, underground structures, termination equipment, poles and structures, and grounding systems as required for a complete and usable system.

17.3.2 Ductbanks, Manholes And Handholes

a. Contractor shall provide all Owner requested communications pathways and all other infrastructure requirements including: ductbanks, conduits, man huts, manholes, handholes, etc.
b. Contractor shall provide and interface communication ductbanks with existing ductbanks as indicated on site plans.
c. All communications ductbanks shall be concrete encased.
d. Provide a complete grounding system for all site communications systems provided as part of this project.

17.3.3 Telecommunications Systems

a. Contractor shall coordinate with the Owner to determine and provide required fiber and copper cables in types, quantity and strand/pair counts.

b. Contractor to provide, install and splice any fiber optic, copper, coax or other low voltage communications cables in existing ductbanks and building entrance points where necessary to temporally or permanently reroute existing communications cables as required to allow the new bed tower construction.
c. Contractor to provide, install and splice any fiber optic, copper, coax or other low voltage communications cables in ductbanks and building entrance points where necessary to provide full communications connectivity to the new bed tower.
d. All splicing hardware provided shall be specifically designed and purposed for the type of cable and location where splicing is to occur.

17.3.4 Cable TV Systems (CATV)

a. Coordinate and provide pathways and cables for the Cable TV Service Provider or head end from existing locations to the new Bed Tower. Contractor shall provide proper type and quantity of cable to support CATV between the existing facility Head End and the connection point in the new Bed Tower.

17.4 Telecommunications Systems

17.4.1 Provide a complete backbone distribution and horizontal communications distribution system including but not limited to all:
a. Copper and Fiber Optic cable
b. Pathways:
1. Ladder type cable tray shall be used in the communication rooms.
2. Basket type cable tray systems shall be utilized in corridors.
3. Secondary pathways mays be j-hooks
c. Equipment Room Hardware: grounding, backboards, connector blocks, protectors for all copper service entrance pairs, patch panels, fiber optic distribution panels, terminators for all fiber optic cables,
d. Work Area Outlet hardware: outlet boxes, Voice/Data jacks and cover plates. Basket type cable tray systems shall be utilized in corridors.
e. Copper & Fiber Optic Patch Cords
f. Labeling materials

17.4.2 The Contractor is responsible for actual telecommunications system equipment/device counts and placement whether shown or implied. Telecommunications equipment/device locations indicated on the drawings must be verified to achieve the Owner's expectations for a complete operational system in accordance with Unified Facility Code requirements.

17.4.3 Provide minimum Category 6A Unshielded Twisted Pair (UTP) copper cable for horizontal voice and data cables or other Category cables per VA Tampa standard at time of construction.

17.4.4 All open office area furniture, standalone conference room furniture, or other standalone furniture or equipment not adjacent to a wall shall be fed from flush-mounted floor boxes. Power poles are not allowed.

17.4.5 Communications rooms shall be constructed in accordance with TIA & BICSI standards.

17.4.6 Provide any and all required firestop at locations where communications cabling passes through fire rated walls. The firestop system provided shall match the all ratings of the wall/floor penetrated.

17.5 Public Address Systems

17.5.1 Provide a Public Address system with speakers in all common spaces and exterior speakers for outside activity spaces

17.5.2 Public Address System will interface with the Mass Notification System to provide backup for notifications in case of MNS failure and in accordance with VA Standards.

17.5.3 The Contractor is responsible for actual public address system equipment/device counts and placement whether shown or implied. Public address system equipment/device locations indicated on the drawings must be verified to achieve the Owner's expectations for a complete operational public address system in accordance with VA requirements.

17.6 Intercommunications Systems

17.6.1 Provide an Intercommunication System to allow two-way communications between all user required spaces such as operating rooms and psych evaluation and observation rooms as required by VA documents.

17.7 Television Systems

17.7.1 System shall include, but is not necessarily limited to, head-end amplifier, amplifiers, splitters, combiners, line taps, RG-6 quad shield cable, outlets, tilt compensators and all other parts, components, and equipment necessary to provide a complete and usable system. Contractor shall be responsible to provide any or all of the above components in quantities necessary to accommodate the expansion of the existing system.

17.7.2 The Contractor shall provide and install a complete and operational Educational and Entertainment Television System (EETV) to incorporate with the existing system. The EETV system shall support interactive patient education, entertainment, Internet and communication services such as movie content, music, e mail, instant messaging and gaming. The EETV system shall interface with nurse call and data delivery systems.

17.7.3 Provide a complete CATV distribution system to be owned and maintained by the VA including all interior equipment required to provide high quality TV signals to all outlets with a return path for interactive television and cable modem access. Each outlet shall be one compression coaxial "F" connection and one RJ-45 Cat 6 connection for data interfacing.

17.7.4 Conduct CATV testing at each of the following points in the system: At each outlet, head end and distribution amplifier inputs and outputs. Provide a minimum of 6-10 dB power at each outlet

17.7.5 Provide a standard CATV system for the Central Utility Plant. Provide RG-6 Quad Shield coaxial horizontal distribution within the CUP from the service provider termination point to locations as shown on the drawings. A CATV system shall not be required for the Parking Garage.

17.7.6 The electrical contractor shall provide power for all system outlets and headend power requirements. Local CATV input shall be provided by the CATV service provider. The EETV systems installer shall provide all equipment, content and interfaces between the CATV system and the EETV system.

17.8 Nurse Call System

17.8.1 Provide and install a complete and operational nurse call system consisting of both a Tone Visual Nurse Call System and an Audio Visual Nurse Call System. The two systems shall be interfaced together and work as one system seamlessly. Contractor shall be responsible to provide any or all of the above components in quantities to accommodate the expansion of the existing system.

17.8.2 The system shall include all of the following minimum features. Provide a nurse call system capable of supporting 125 patient stations and 5000 peripheral stations utilizing the latest in communication technology and components. The system shall utilize a standard, UL listed system that is the product of a Manufacturer regularly engaged in the manufacture of nurse call systems. Both systems shall be of the same manufacturer.

17.8.3 The Nurse Call System shall consist of all patient and nurse/doctor interface stations required for a comprehensive and intuitive nurse call system. The nurse call system shall offer a complete line of features commonly incorporated in state of the art Bed Tower functions. Patient and nurse stations will be placed within close reach of patient and practitioners positions within the clinical areas, dressing rooms, treatment rooms, and patient accessible restrooms. Patient annunciator lights shall be provided above the entrance door to each room. Zone annunciator lights shall be provided in corridors for visual notification of alarm activation in that corridor.

17.8.4 Provide a Bed Tower wide complete and operational Asset Tracking System for high value instruments, equipment and personnel. The system shall be software based with Radio Frequency Identification tags and compatible sensors. The system shall be integrated with the Nurse Call system to cancel station alarms upon entrance to the room where the call is initiated. The system shall have the capability to locate an asset in a room or hallway and show asset movement sensor to sensor. The system shall also be capable of personnel tracking by use of an assigned asset tag to that person.

17.9 Distributed Antenna System (DAS)

17.9.1 The Contractor shall provide a complete and operational Distributed Antenna System in the new bed tower. The system shall be a broadband distribution system capable of transmitting various signals within the Bed Tower for various systems such as Ethernet data, cell phone repeating, FM radio repeating.

17.9.2 The Distributed Antenna System shall include all necessary equipment to interface with the existing head end base station equipment, backbone and distribution cabling, external antenna (if required), interior antennas and amplifiers. Contractor shall be responsible to provide any or all of the above components in quantities to accommodate the expansion of the existing system.

17.9.3 All newly proposed DAS hardware installed under this project shall be fully compatible with the existing facility DAS for proper system functionality.

17.9.4 For the Central Utility Plant and the Parking Garage structures, Nurse Call and the Distributed Antenna systems are not required.

17.10 Provide a Mass Notification System in accordance with the Fire Alarm UFC Standards and in accordance with the PTS and ESR documents.

18 CORROSION CONTROL AND CATHODIC PROTECTION

18.1 The VA TIL specifications 23 10 00 FACILITY FUEL SYSTEMS and section 26 42 00 CATHODIC PROTECTION SECTION for underground steel oil tanks and oil piping are required only when the soil resistivity is less than 4000 ohm-cm. No new underground piping is anticipated for the generator being installed in the remaining empty bay of Building 54 Generator Plant. Refer to Appendix S for as-built drawings of this plant.

19 ENVIRONMENTS – HAZARDOUS MATERIALS

19.1 The NBT project has numerous ties of new utility system to the existing Building 1 hospital building, as described and referenced in previous 01 10 10 sections. These ties-ins will generally occur at the Basement and Ground levels.

19.2 The NBT project has numerous ties of new physical corridors linkages back to the existing Building 1 hospital building. Unless noted other wise on the drawings, the extent of these connections is to open walls of the existing building and only patch are repair areas Building 1,

within the immediate one foot area. These ties-ins will occur at Ground, First and Second floor levels, as indicated in Appendix F.

19.3 Refer to Appendix T, Existing Building 1 Hazardous Materials drawings for the anticipated scope areas that hazardous materials will be encountered during construction. The Contractor shall mitigate and/or remove the hazardous materials encountered in Building 1 in areas that new construction work is installed.

19.4 For technical guidance on performing this work, reference the VA TIL's Asbestos Abatement Design Manual for Hospitals (and all VA building types) dated July 2011. http://www.cfm.va.gov/til/dmanual/dmasbhosp.pdf Apply and use as applicable to the project scope areas, the VA TIL Division 2 Asbestos Abatement specs for, traditional, glovebag, floor tile and mastic, roofing, transite and total demolition projects in addition to lead based paint removal and disposal. VA TIL Division 1 spec, 01 35 26 shall be incorporated for use in guiding the work.

20 SUSTAINABLE DESIGN

20.1 Sustainable Drivers and Federal Mandate Compliance

The following are specific sustainable drivers, applicable codes, and Federal Mandates for this project.

- LEED for Healthcare (LEED-HC) v2009 for the Bed Tower
- DVA Sustainable Design Manual, May 2014
- DVA Guiding Principles Checklist for LEED-HC v2009
- Energy Independence and Security Act 2007 (EISA)
- Energy Policy Act of 2005 (EPAct)
- Executive Order 13423
- Executive Order 13514
- UFC 1-200-02

The following is a summary of the high-level requirements for the above referenced sustainable drivers and mandates that are included in the project that need to be followed/ implemented by the D/B Contractor. The status of each item is the RFP AE's best estimate of the ability of the D/B Contractor to meet such requirements. Only building design-related (not agency level) requirements are listed. Please note requirements are not duplicated.

DVA Sustainable Design Requirements		
General Project Requirements		
	Use a collaborative and integrated design process; Follow Whole Building Design Guide Integrated Design Process	Yes
	Establish performance goals for siting, energy, water, materials and indoor environmental quality	Yes
	Develop life-cycle cost analysis and Solar Hot Water (SHW) analysis	Yes
	Certified using the LEED Rating System	No

	Commission the project	Yes
	Install applicable meters and sub-meters	Yes
Site Selection & Development		
	Locate near diverse housing resources	Yes
	Locate in high density areas	Yes
	Coordinate with local/ regional planning officials	Yes
	Multiple/ alternative transportation options	Yes
	Reuse site	Yes
	Design for climate change	Yes
	Mitigate heat island effect	Yes
	Mitigate stormwater runoff	Maybe
Energy		
	Reduce energy efficiency 30% compared to ASHRAE 90.1-2013 baseline if life-cycle cost effective and excluding receptacle and process loads	Yes
	Perform energy modeling	Yes
	Use of renewable energy	Maybe
	Combined heat and power	Unlikely
Water		
	Reduce indoor potable water use 20%	Yes
	Reduce outdoor potable water use for irrigation 50%	Yes
	Install advanced water meters	Yes
	Use WaterSense labeled products	Yes
Indoor Environmental Quality		
	Comply with DVA HVAC Design Manual	Yes
	Establish/ implement moisture control strategy	Yes
	Achieve minimum daylight factors of 2% in 75% of spaces for critical visual tasks	Maybe
	Specify low-emitting materials	Yes
	Protect indoor air quality during construction	Yes
	Locate smoking areas at least 25 feet away from the building	Yes
	Minimize use of toxic and hazardous chemicals and materials	Yes
	Design to meet PG 18-3 Noise Transmission Control	Yes
Environmental Impacts of Materials		

	Meet or exceed EPA's recycled content requirements	Yes
	Meet or exceed USDA's bio-based content requirements	Maybe
	Divert at least 50% of construction waste from landfills	Yes
	Provide sufficient space for recycling in buildings	Yes
	Eliminate the use of ozone depleting materials	Yes
LEED Requirements		
	Bed Tower: LEED for Healthcare v2009 Silver Equivalency	Yes
Energy Independence and Security Act 2007 (EISA)		
	Apply sustainable design principles to the siting, design, and construction of buildings subject to the standards, as described in Part 433.	Yes
	Use energy efficient lighting fixtures and bulbs where life-cycle cost-effective.	Yes
	Use solar hot water heat for 30% of the hot water demand, if life-cycle cost-effective.	Yes
	Reduce fossil fuel-generated energy consumption 65% (by FY2015).	Yes
	Utilize commissioning	Yes
Energy Policy Act of 2005 (EPAct)		
	Design for 30% below ASHRAE 90.1-2004 (excluding plug loads), if life-cycle cost-effective. This project will be using ASHRAE 90.1-2013.	Yes
	Design electric metering to be sampled hourly	Yes
	Use water conservation technologies where life-cycle cost-effective	Yes
Executive Order 13423		
	Comply with the Memorandum of Understanding in Federal Leadership in High Performance and Sustainable Buildings (HPSB) which covers federal leadership in the design, construction, and operation of High-Performance and Sustainable Buildings	Yes
	Design to earn the Energy Star targets for new construction and major renovations	Yes
Executive Order 13514		
	Achieve by 2030, zero-net-energy in buildings entering the planning process after 2020	No
UFC 1-200-02		
	Provide on-site renewable energy systems in accordance with ASHRAE 189.1 Section 7.4.1.1 where life-cycle cost effective.	Maybe
	Utility meter must be installed at each building for each utility serving the building.	Yes
	Meet the requirements of ASHRAE 189.1 Section 6.3.2.1 (Plumbing	Yes

	Fixtures) and Section 6.3.2.2 (Appliances)	
	If potable water is used to improve a building's energy efficiency, meet the requirements of ASHRAE 189.1 Sections 6.3.2.3(a) and 6.3.2.3 (c) if life cycle cost effective	Yes
	Meet the requirements of ASHRAE 189.1 Section 8.3.1 (Indoor Air Quality) and Section 8.3.2 (Thermal Environmental Conditions for Human Occupancy)	Yes
	For Medical Treatment Facilities, refer to UFC 4-510-01 Medical Military Facilities for ventilation and thermal comfort criteria	Yes
	Meet the requirements of ASHRAE 189.1 Section 8.4.1 (Daylighting by Sidelighting) or Section 8.5.1 (Daylighting Simulation). Provide automated lighting controls in accordance with UFC 3-530-01	Yes

20.2 LEED Certification

The Bed Tower will utilize LEED-HC v2009 Silver Equivalency (the project will not be registered with the USGBC or seek LEED certification). There are some LEED credits that coincide with the DVA Sustainable Design Requirements and Federal Mandate compliance, and such requirements will be placed in the specifications, or included in this narrative for the D/B Contractor to include in their design. The Status of each credit is HDR's best estimate of the ability of the D/B Contractor to attain that specific credit. The D/B Contractor may change which credits are attained as long as the requirement of LEED Silver Equivalency is attained.

20.3 LEED Compliance Matrix

The following table identifies the credits within the LEED Rating System and Federal Mandate requirements to identify the elements that are planned to be incorporated into the design of the building. The matrix serves as a tool to ensure that elements of sustainable design are integrated into the facility design.

LEED-HC Sustainable Design Category	Design Features	Status [(1)]
Sustainable Sites		
SSp1: Construction Activity Pollution Prevention	Requirements will be placed in the project specifications. This credit is typically earned due to local requirements.	Required
SSp2: Environmental Site Assessment	Need copy of Environmental First Search site assessment to confirm compliance	Required
SSc1: Site Selection	Site is classified as Farmland of unique importance by NRCS. A waiver can be received from NRCS so this credit can be attained. Site appears to meet all other credit requirements.	Likely
SSc2: Development Density and Community Connectivity	Project location appears to meet requirements of Option 2	Yes
SSc3: Brownfield Redevelopment	Site does not appear to be a brownfield	Unlikely

SSc4.1: Alternative Transportation: Public Transportation Access	Location of bus stop @ 131st Ave just west of N 30th St needs distance verified based on project layout to determine credit compliance	Likely
SSc4.2: Alternative Transportation: Bicycle Storage and Changing Rooms	Project appears to be able to achieve credit	Yes
SSc4.3: Alternative Transportation: Low Emitting & Fuel Efficient Vehicles	Parking should be provided for such vehicles	Yes
SSc4.4: Alternative Transportation: Parking Capacity	Case 1 Option 3: No new parking (removing parking spaces)	Yes
SSc5.1: Site Development: Protect or Restore Habitat	Difficult to achieve based on existing site conditions and planned project design	Unlikely
SSc5.2: Site Development: Maximize Open Space	Difficult to achieve based on existing site conditions and planned project design	Unlikely
SSc6.1: Stormwater Design: Quantity Control	Credit can be achieved through the use of storm chambers	Likely
SSc6.2: Stormwater Design: Quality Control	Credit can be achieved utilizing existing dry pond or under drains	Likely
SSc7.1: Heat Island Effect: Non-roof	Parking lot planned to be asphalt	Unlikely
SSc7.2: Heat Island Effect: Roof	Cool roofs are planned for the design	Yes
SSc8: Light Pollution Reduction	Project should be able to meet requirements if exterior lighting is properly coordinated	Yes
SSc9.1: Connection to the Natural World - Places of Respite	Places of respite shall be included in the project design	Yes
SSc9.2: Connection to the Natural World - Direct Exterior Access for Patients	No plans to provide such access on higher level floors	No
Water Efficiency		
WEp1: Water Use Reduction	Low flow fixtures planned for the design will meet the prerequisite requirements. This is a DVA Guiding Principles Required Credit for LEED-HC.	Required
WEp2: Minimize Potable Water Use for Medical Equipment Cooling	DVA is providing medical equipment and will need to comply	Required
WEc1: Water Efficient Landscaping - No Potable Water Use or No Irrigation	Could capture rainwater to meet credit requirements. Reclaimed water is not currently available on the campus, therefore, potable water is used.	Unlikely
WEc2: Water Use Reduction - Measurement & Verification	Closed loop hydronic and cold water makeup are potentially in design - meter if included	Yes
WEc3: Water Use Reduction, 30%, 35%, or 40% Reduction	Planned fixture flows are as follows: 1.28 gpf water closets, 0.125 gpf urinals, 0.5 gpm lavatories with 12 sec duration in public areas, 1.5 gpm showers,	Yes

	and 1.5 gpm break room sinks.	
WEc4.1: Water Use Reduction - Building Equipment	Plans only include dry vacuum pumps for med vac; all other systems not included	Yes
WEc4.2: Water Use Reduction - Cooling Towers	No cooling tower in project	No
WEc4.3: Water Use Reduction - Food Waste Systems	Canteen equipment should meet requirement	Yes
Energy & Atmosphere		
EAp1: Fundamental Commissioning of the Building Energy Systems	Fundamental commissioning will be performed on the project	Required
EAp2: Minimum Energy Performance	Project designed to meet ASHRAE minimum requirements	Required
EAp3: Fundamental Refrigerant Management	Compliant refrigerant types will be included in the project design	Required
EAc1: Optimize Energy Performance	Minimum requirement is 30% efficient compared to ASHRAE 90.1-2013 baseline. The LEED baseline is 90.1-2007. Energy analysis will be required to show compliance with ASHRAE 90.1-2007 and 90.1-2013 unless otherwise instructed. This is a DVA Guiding Principles Required Credit.	Yes
EAc2: On-Site Renewable Energy	The D/B Contractor will be performing the renewable energy analysis.	Unlikely
EAc3: Enhanced Commissioning	Enhanced commissioning will not be performed on the project.	No
EAc4: Enhanced Refrigerant Management	Compliant refrigerant types will be included in the project design	Yes
EAc5: Measurement and Verification	Metering requirements in place for DVA; additional requirement is putting the M&V Plan in place	Yes
EAc6: Green Power	Credit attainment is a DVA decision	Unlikely
EAc7: Community Contaminant Prevention - Airborne Releases	Equipment should comply if included in the project	Likely
Materials & Resources		
MRp1: Storage & Collection of Recyclables	DVA will be required to recycle paper, cardboard, plastic, glass, and metals within the building, and storage space for such items will need to be included in the design	Required
MRp2: PBT Source Reduction - Mercury	Requirements will be included in the design and project specifications	Required
MRc1.1: Building Reuse, Maintain 55%, 75%, or 95% of Existing Walls, Floors & Roof	New construction – no building reuse	No
MRc1.2: Building Reuse, Maintain 50% of Interior Non-Structural Elements	New construction – no building reuse	No
MRc2: Construction Waste Management	Minimum DVA requirement is 50%; 75% diversion will be placed in the project specifications. This is a DVA Guiding Principles Required Credit.	Yes

MRc3: Sustainably Sourced Materials and Products	Requirements will be included in the project specifications. This is a DVA Guiding Principles Required Credit.	Yes
MRc4.1: PBT Source Reduction - Mercury in Lamps	Requirements will be included in the project specifications	Yes
MRc4.2: PBT Source Reduction - Lead, Cadmium and Copper	Requirements will be included in the project specifications	Yes
MRc5: Furniture & Medical Furnishings	Minimum DVA requirement is 30%; requirements will be included in the project specifications. This is a DVA Guiding Principles Required Credit.	Yes
MRc6: Resource Use - Design for Flexibility	Requirements difficult to obtain depending on building program and design	Unlikely
Indoor Environmental Quality		
EQp1: Minimum IAQ Performance	Project will be designed to meet ASHRAE 170-2008.	Required
EQp2: Environmental Tobacco Smoke (ETS) Control	Credit requirements will be provided with the project design	Required
EQp3: Hazardous Material Removal or Encapsulation	Does not appear project site has such issues	Required
EQc1: Outdoor Air Delivery Monitoring	Air quality monitoring will be provided in the design in all applicable spaces	Yes
EQc2: Acoustic Environment	Need to also follow VHA Guide PG 18-3 Topic 11 Noise Transmission Control	Yes
EQc3.1: Construction IAQ Management Plan - During Construction	Requirements will be placed in project specifications	Yes
EQc3.2: Construction IAQ Management Plan - Before Occupancy	Requirements will be placed in project specifications	Yes
EQc4: Low-Emitting Materials	Requirements will be placed in project specifications. This is a DVA Guiding Principles Required Credit.	Yes
EQc5: Indoor Chemical and Pollutant Source Control	Design should include MERV 13 filters, permanent walkoff mats at all regularly used entrances, and negative pressure in chemical use/ storage area rooms. Pressurized vestibules needed with CFD analysis.	Yes
EQc6.1: Controllability of Systems, Lighting	All multi-occupant spaces will have lighting controls to meet needs of spaces (typically dimming, stepped dimming, or dual level switching); desk furniture should also include task lighting	Yes
EQc6.2: Controllability of Systems, Thermal Comfort	Providing thermostats for 50% of the occupants challenging depending on program and design; all multi-occupant spaces will have such requirements	Unlikely
EQc7: Thermal Comfort, Design	Project will be designed to meet ASHRAE 55-2004. DVA responsible to complete verification survey	Yes

EQc8.1: Daylight and Views, Daylight 75% of Spaces	Requirements difficult to obtain depending on building program and design	Unlikely
EQc8.2: Daylight and Views, Daylight 90% of Spaces	Requirements difficult to obtain depending on building program and design	Unlikely

(1) Status Qualifier:

Yes: Project should be able to achieve credit based on DVA and design performance criteria
Likely: Project has high likelihood to achieve credit based on DVA and design performance criteria
Unlikely: Project has low likelihood to achieve credit based on DVA and design performance criteria
No: Does not appear project can achieve credit based on DVA and design performance criteria

20.4 LEED Scorecard

The LEED Scorecard for the Bed Tower are provided at the end of this section. Please note the Scorecard will change as the design progresses. The LEED credit points are classified in the same fashion (Yes, Likely, Unlikely, and No) as stated in the LEED Compliance Matrix section.

20.5 Energy Analysis

The Energy Modeling report, Life-Cycle Cost Analysis (LCCA), and Solar Hot Water (SHW) Analysis will be the responsibility of the D/B Contractor to perform. A Climate and Place Analysis, with high level energy information, has been provided to aid in the building design process.

21 COMMISSIONING

21.1 Design Phase (CxD)

The Commissioning Specialist for the Design Phase (CxD) shall be the commissioning agent for the design portion of work.

The CxD shall be responsible for incorporating all design phase commissioning documentation provided by the CxG into the design, including the design phase Commissioning Plan and commissioning specifications. If requested, the CxD shall directly inform the CxG of the status of all of the design commissioning activities. The CxD shall provide sufficient lead-time to the CxG for participation. The DB Designers of Record (DOR) are responsible for providing the Basis of Design (BoD) document, participation in all pre-design and design phase Cx activities, and shall be available for questions in construction Cx activities.

21.2 Construction Phase (CxC)

The Commissioning Specialist for the Construction Phase (CxC) shall be the Contractor's key commissioning leader. For this project the CxC shall responsible for all commissioning requirements for the construction as defined by the commissioning plan.

The CxC shall be the construction Cx leader responsible for scheduling and coordinating all construction phase commissioning activities, verifying the refinement of PFC's and FPT's to match the specific equipment purchased by the DB contractor for this project, and direct oversight and reporting of the execution of the construction Commissioning process. If

requested, the CxC shall directly inform the CxG of all construction commissioning activities, decisions and content during the construction phase. The CxC shall provide sufficient lead-time to the CxG for participation. The CxC shall schedule construction Cx meetings, document/generate meeting content, chair the construction Cx meetings, provide construction Cx meeting minutes, verify that construction issue tracking logs are developed and provide guidance in the entire construction Cx process. The CxC shall execute all prefunctional checklists and lead all functional performance testing (FPT). The CxC shall facilitate (coordinate meeting locations, document attendance, record report issue log follow ups, develop schedule, record meeting notes, provide equipment and other assistance to the construction commissioning effort) construction Cx meetings and coordinate construction Cx activities. Witnessing of the testing shall be under guidance by the CxC and witnessed by the CxG at the CxG discretion. The CxC may be the same individual as the CxD.

21.3 Third Party Commissioning Agent (CxG)

A third party independent commissioning agent for the Government (CxG) unrelated to the Design Build team will be appointed by the Government. This role will have oversight of the entire commissioning process over the life of the project, including the development of the Commissioning Plan and commissioning specifications. Smith Seckman Reid Commissioning (SSR Cx) will fill this role since they are the commissioning agent during the creation of the Design Build RFP and will continue on the project for the remaining design, construction and warranty period. The project shall include total building commissioning (TBCx) in accordance with UFC 4-510-01 and as modified by this RFP to include the VA Whole Building Commissioning Process Manual.

21.4 Systems to be Commissioned

The following table lists the systems that are to be commissioned as per the VA TIL specifications:

Systems To Be Commissioned	**Description**
Building Exterior Closure - Refer to Specification 01 91 15	
Foundations (excluding structural)	Standard, special, slab-on-grade, vapor barriers, air barriers
Basements	Basement walls, crawl spaces, waterproofing, drainage
Superstructure	Floor construction, roof construction, sunshades, connections to adjacent structures
Exterior Closure	Exterior walls, exterior windows, exterior doors, louvers, grilles and sunscreens,
Roofing	Roof system (including parapet), roof openings (skylights, pipe chases, ducts, equipment curbs, etc.)
Specialties	

Patient Bed Service Walls	Medical gas certification and cross check, electrical connections
Equipment	
Parking Control Equipment	Barriers
Laboratory Fume Hoods	Fume Hood Certification
Biological Safety Cabinets	Cabinet Certification
Packaged Incinerators	Combustion Testing, Cycle Certification
Conveying Equipment	
Electric Dumbwaiters	Interface with other systems (Fire Alarm, etc.) [ASTM testing and certification by others]
Elevators	Interface with other systems (fire alarm, etc.) [ASTM testing and certification by others]
Escalators	Interface with other systems (fire alarm, etc.) [ASTM testing and certification by others]
Material Delivery Systems	Interface with other systems (fire alarm, elevators, etc.)
Pneumatic Tube Systems	Interface with other systems (fire alarm, etc.)
Fire Suppression	
Fire Pump	Fire Pump, jockey pump, fire pump controller/ATS
Fire Sprinkler Systems	Wet pipe system, dry pipe system, pre-action system, special agent systems
Plumbing	
Domestic Water Distribution	Booster pumps, backflow preventers, water softeners, potable water storage tanks
Domestic Hot Water Systems	Water heaters**, heat exchangers, circulation pumps, point-of-use water heaters*
Sewerage Pump Systems	Sewage ejectors
Wastewater Pump Systems	Sump pumps

Sanitary Waste Interceptors	Grease interceptors, acid neutralizers
General Service Air Systems	Packaged compressor systems, air dryers, filtration
Medical Air Systems	Packaged medical air compressor units. Outlet certification, cross-connection verification
Medical Vacuum Systems	Packaged medical vacuum units, outlet certification, cross-connection verification
Dental Air Systems	Packaged dental air compressor units, outlet certification, cross-connect verification
Dental Evacuation and Vacuum Systems	Packaged Dental Evacuation units, packaged dental vacuum units, outlet certification, cross-connection verification
Waste Anesthesia Gas Systems	Packaged Waste Anesthesia Gas units, outlet certification, cross-connection verification
Medical Gas Systems (other than Medical Air Systems)	Medical gas (oxygen, nitrogen, nitrous oxide, etc.) tank/manifold systems, outlet certification, cross-connection verification
Chemical Waste Systems	Chemical storage tanks, neutralization systems, ventilation, process control
Reverse-Osmosis Systems	Packaged Reverse-Osmosis systems
Water De-Alkalizing Systems	Package Water De-Alkalizing systems
HVAC	
Noise and Vibration Control	[Noise and vibration levels for critical equipment such as Air Handlers, Chillers, Cooling Towers, Boilers, Generators, etc. will be commissioned as part of the system commissioning]
Direct Digital Control System**	Operator Interface Computer, Operator Work Station (including graphics, point mapping, trends, alarms), Network Communications Modules and Wiring, Integration Panels. [DDC Control panels will be commissioned with the systems controlled by the panel]

Chilled Water System**	Chillers (centrifugal, rotary screw, air-cooled), pumps (primary, secondary, variable primary), VFDs associated with chilled water system components, DDC Control Panels (including integration with Building Control System)
Condenser Water System**	Cooling Towers, Fluid Coolers, heat exchangers/economizers, pumps, VFDs associated with condenser water system components, DDC control panels.
Steam/Heating Hot Water System**	Boilers, boiler feed water system, economizers/heat recovery equipment, condensate recovery, water treatment, boiler fuel system, controls, interface with facility DDC system.
HVAC Air Handling Systems**	Air handling Units, packaged rooftop AHU, Outdoor Air conditioning units, humidifiers, DDC control panels
HVAC Ventilation/Exhaust Systems	General exhaust, toilet exhaust, laboratory exhaust, isolation exhaust, room pressurization control systems
HVAC Energy Recovery Systems**	Heat Wheels, Heat Recovery Loops, AHU Integrated Heat Recovery
HVAC Terminal Unit Systems**	VAV Terminal Units, CAV terminal units, fan coil units, fin-tube radiation, unit heaters
Decentralized Unitary HVAC Systems*	Split-system HVAC systems, controls, interface with facility DDC
Unitary Heat Pump Systems**	Water-source heat pumps, controls, interface with facility DDC
Humidity Control Systems	Humidifiers, de-humidifiers, controls, interface with facility DDC
Hydronic Distribution Systems	Pumps, DDC control panels, heat exchangers,
Facility Fuel Systems	Boiler fuel system, generator fuel system
Geothermal Energy Direct Use Heating **	Geothermal well, ground heat exchanger, geothermal pumps, heat exchanger, valves, instrumentation
Solar Energy Heating Systems **	Solar collectors, heat exchangers, storage tanks, solar-boosted domestic hot water heater, pumps, valves, instrumentation

Facility Fuel Gas Systems	Witness Natural gas piping pressure testing, natural gas compressors and storage, propane storage
Smoke Evacuation System	Atrium smoke evacuation, other smoke evacuation and smoke management systems, controls, interface with other systems (fire alarm), emergency operation.
Electrical	
Medium-Voltage Electrical Distribution Systems	Medium-Voltage Switchgear, Medium-Voltage Switches, Underground ductbank and distribution, Pad-Mount Transformers, Medium-Voltage Load Interrupter Switches,
Grounding & Bonding Systems	Witness 3rd party testing, review reports
Electric Power Monitoring Systems	Metering, sub-metering, power monitoring systems, PLC control systems
Electrical System Protective Device Study	Review reports, verify field settings consistent with Study
Secondary Unit Substations	Medium-voltage components, transformers, low-voltage distribution, verify breaker testing results (injection current, etc.)
Low-Voltage Distribution System	Normal power distribution system, Life-safety power distribution system, critical power distribution system, equipment power distribution system, switchboards, distribution panels, panelboards, verify breaker testing results (injection current, etc.)
Emergency Power Generation Systems	Generators, Generator paralleling switchgear, automatic transfer switches, PLC and other control systems
Lighting & Lighting Control** Systems	Emergency lighting, occupancy sensors, lighting control systems, architectural dimming systems, theatrical dimming systems, exterior lighting and controls
Cathodic Protection Systems	Review 3rd party testing results.
Lightning Protection System	Witness 3rd party testing, review reports

Perturbation Testing	Testing of Emergency Power Systems Loss of power feed, confirmation of the following values: Time of ramp up of generator to full power Emergency lighting adequacy Effect on waste treatment facilities (if applicable) Alarms and notification system adequacy Drives & Controls functionality Functionality of all UPS systems And Switch-over of the above when main power feed is restored Perturbation Testing shall occur after completion of Functional performance Testing. Requires require signed certifications by Contractor's rep and Government witness that systems operated and responded properly.
Communications	
Grounding & Bonding System	Witness 3rd party testing, review reports
Structured Cabling System	Witness 3rd party testing, review reports
Master Antenna Television System	Witness 3rd party testing, review reports
Public Address & Mass Notification Systems	Witness 3rd party testing, review reports
Intercom & Program Systems	Witness 3rd party testing, review reports
Nurse Call & Code Blue Systems	Witness 3rd party testing, review reports
Security Emergency Call Systems	Witness 3rd party testing, review reports
Duress Alarm Systems	Witness 3rd party testing, review reports
Electronic Safety and Security	
Grounding & Bonding	Witness 3rd party testing, review reports
Physical Access Control Systems	Witness 3rd party testing, review reports
Access Control Systems	Witness 3rd party testing, review reports

Security Access Detection Systems	Witness 3rd party testing, review reports
Video Surveillance System	Witness 3rd party testing, review reports
Electronic Personal Protection System	Witness 3rd party testing, review reports
Fire Detection and Alarm System	100% device acceptance testing, battery draw-down test, verify system monitoring, verify interface with other systems.
Renewable Energy Sources	
Geothermal Energy Electrical Generation Systems **	Geothermal well, DC-AC Inverters, storage batteries, turbine generator modules, switchgear, combiner boxes, instrumentation, monitoring and control systems
Solar Energy Electrical Power Generation Systems **	Solar collector modules, DC-AC inverter, storage batteries, combiners, Switchgear, instrumentation, monitoring and control systems
Wind Energy Electrical Power Generation Systems **	Wind Turbines, DC-AC inverter, storage batteries, combiners, switchgear, instrumentation, monitoring and control systems
Site Utilities	
Water Utilities	City Water Service Entrance, Backflow Prevention, Pressure Control, Booster Pumps, Irrigation Systems, Rainwater Harvesting Systems
Sanitary Sewerage Utilities	City Sanitary Connection, Waste Treatment Systems
Storm Drainage Utilities	City Storm Water Connection, Site Storm Water Distribution
Energy Distribution Utilities	Connection to Third Party Energy (Steam, High Temp Hot Water, Chilled Water) Supply Systems, Metering, Pressure Control
Transportation	
Active Traffic Barrier Systems	Witness 3rd party testing
Integrated Systems Tests	

Loss of Power Response	Loss of power to building, loss of power to campus, restoration of power to building, restoration of power to campus.
Fire Alarm Response	Integrated System Response to Fire Alarm Condition and Return to Normal

Table Notes

All certification tests specified are the responsibility of the DB.

Functional Performance Test protocols are written by the CxG. Functional Testing is performed by the DB and is witnessed by the CxG.

** Denotes systems that LEED requires to be commissioned to comply with the Fundamental Commissioning pre-requisite.

END OF SECTION 01 10 10

SECTION 01 10 12
DESIGN AFTER AWARD

1. DESIGN RESPONSIBILITY

The Contractor shall furnish and be responsible for a complete set of design documents as required in specification Section 01 10 10 SUPPLEMENTAL DESIGN REQUIREMENTS, and Section 01 00 00, ADDITIONAL SPECIAL CONTRACT REQUIREMENTS and as required hereinafter. Information provided below is intended to supplement the Mobile District Design Manual requirements. The Design Manual is available on the internet at:
http://www.sam.usace.army.mil/Portals/46/docs/military/engineering/Design%20Manual/Desman07.pdfT
here are references to VA design manual/standards throughout the RFP package so we'll need to make sure there is no misunderstanding as to which standard the D-B contractor is to follow.

2. DESIGN SUBMITTAL

The Contractor shall submit its design in different phases to the Government for review. The number and requirements of each design submittal are listed below. The number and contents of the design submittals shall be reflected in the Contractor's progress charts. All comments for each submittal shall have been annotated and incorporated into the subsequent design before approval is granted.

2.1 Technical Specifications

Utilize Unified Facilities Guide Specifications (UFGS) in the SpecsIntact format. Utilize complete project specifications to cover the full scope of work. Delete references to materials that are not allowed or that are not intended to be provided. Government standards will not be referenced in the specifications; instead, provide any specific requirement of the standard in the specification as applicable.

Specifications shall comply with performance criteria, products and finishes, and other criteria prescribed in this RFP. Although the designers of record (DOR) must tailor the specifications for this project, in doing so, the DOR shall not alter or edit the wording of the UFGS in any way that would lessen the quality of construction materials required by the various criteria and UFGS. The appropriate Specifications shall ensure that all project design requirements, current code requirements, and regulatory requirements are met.

Operations and maintenance (O&M) portions of UFGS shall be edited by the respective Designers of Record in the design phase. O&M requirements in the UFGS shall not be edited out. Submittals, operating procedures, schematics, as-built drawings, manuals, software, and computer hardware required in the UFGS for system operation incorporated in the design phase are critical to the operation of the new facility on completion.

2.1.1 Design Submittals

Items of work not Fast-Tracked shall be submitted in a maximum of four complete packages: Concept Design (35% Phase), Interim Design (65% Phase), 100% Unreviewed (100% Phase) and Final Submittal (100% Corrected Phase) Design stages as outlined in the following paragraphs. Partial design

submissions of various portions of the project other than those identified for fast-tracking will not be allowed.

2.1.2 Fast Tracking

The contractor may at his option, "fast track" the design and construction of site work, exterior utilities, the building foundation, and all environmental permitting. These items may be initially designed to the 100% Unreviewed stage, and submitted with the 65% Design Submittal (with each drawing and specification section marked as "Fast Track"). An Intermediate Backcheck Submittal shall be provided for Fast-Tracked items for review and approval by the Government, so that a Partial Notice to Proceed (NTP) can be issued to the Contractor for that portion of the work.

2.2 PERMITTING

The Contractor is responsible for identifying and obtaining all necessary permits and licenses prior to the start of construction.

3. GOVERNMENT APPROVED SUBMITTALS

The approval of submittals by the Contracting Officer's Representative shall not be construed as a complete check, but will indicate only that the design is in conformance with the contract requirements. Approval will not relieve the Contractor of the responsibility for any error which may exist, as the Contractor is responsible for the design and construction of all work.

4. SCHEDULE

4.1 Design Schedule

Within 21 days after Notice to Proceed, the Contractor shall submit, for approval, a complete design schedule with all submittals (including BIM deliverables at milestone submittals, refer to BIM REQUIREMENTS in this section for additional information) and review times indicated by calendar dates. The schedule shall be updated monthly with copies furnished to the Contracting Officer. No progress payments will be made without an approved schedule. Any additional changes which the Contractor may wish to make to number or composition of design submittals shall be made 30 days prior to the expected submittal date. The Contractor shall allow 21 days for the Government review period if submittal dates are met. If a scheduled design submittal date is not met without notifying the Contracting officer in writing one (1) week in advance, 28 days shall be allowed for the Government review period. If a submittal date is not going to be met, the Contractor shall notify the Contracting Officer, in writing, one (1) week prior to the scheduled submittal date. Failure to do so will increase the Government review time by seven (7) days. See paragraph: "SUBMITTAL REVIEW". Coordinate with specification section 01 00 00 Additional Special Contract Requirements and specification section 01 32 01.00 10 Project Schedule. Coordinate with CONTRACTOR-PREPARED NETWORK ANALYSIS SYSTEM.

4.2 Predefinition Conference and Project Kick-Off Meeting

Within 14 days after award of contract, the Contractor, all major subcontractors, DB AE design team with all designers of record (DOR) shall attend and participate in a mandatory project kick-off meeting at James A.

Haley Veterans Hospital (JAHVH), Tampa, Florida. BIM Implementation plan shall be presented at this meeting.

The objective of the Kick-off Meeting is to provide an opportunity for the Design Build Contractor and their design team an opportunity to meet the User Group, USACE, CFM and other PDT personnel. A Site Verification Visit shall precede the kick-off meeting to ensure the D-B Contractor's familiarity with the site, availability of utilities, local conditions, regulatory or other environmental restrictions or licensing requirements, and any Installation-specific design requirements.

5. PROGRESS CHARTS

The Contractor shall prepare and submit a progress chart to the Contracting Officer. The progress chart shall show, as a percentage of the total design price, the various items included in the contract and the order in which the Contractor proposes to carry on the work, with dates on which he will start the features of the work and the contemplated dates for completing same. Significant milestones such as review submittals shall be shown. The Contractor shall assign sufficient technical, supervisory and administrative personnel to insure the prosecution of the work in accordance with the progress schedule. The Contractor shall correct the progress schedule at the end of each month and shall deliver three copies to the Contracting Officer. Inasmuch as monthly partial payments to the Contractor are based to a large extent on the progress schedule, the monthly corrections should be realistically made to the best ability of the Contractor. Coordinate with specification section 01 00 00 Additional Special Contract Requirements and specification section 01 32 01.00 10 Project Schedule. Coordinate with CONTRACTOR-PREPARED NETWORK ANALYSIS SYSTEM.

6. INTERIOR DESIGN

6.1 Predefinition Conference

The Contractor shall lead a predefinition conference at JAHVH with the User Group, USACE, CFM and other PDT members in attendance. The purpose of the predefinition conference is to present and discuss the SID/FFE proposals for the project. Actual exterior and interior materials, finishes and colors are to be provided for review and comment. The Contractor may provide colored elevations/perspectives of the SID/FFE color scheme to assist in the discussion of the SID/CID. At the end of the predefinition conference, the Government will decide the necessary adjustments needed to the SID and this information will be used by the Contractor to further develop the project.

6.2 Structural Interior Design (SID)

The Structural Interior Design (SID) includes selection, specification and installation of all the building related finishes, materials and colors. The design philosophy shall be interpreted using the UFGS 09 06 90 Color Schedule. All SID materials, finishes and colors shall be reviewed by the Government for compliance with the RFP. All SID submittals will run concurrent with the Architectural submittals.

6.3 Furniture, Fixtures and Equipment (FFE) Interior Design Description

The FFE includes the design and specification of all moveable furnishings for all occupied and unoccupied areas as indicated in Section 01 10 10 Design Criteria. Refer to Attachment "B" for submittal requirements.

6.3.1 FFE Interior Design Requirements

6.3.1.1 The design, of the FFE shall be the responsibility of the Contractor and fully coordinated with the building systems design for power, voice, data and mechanical devices such as thermostats, fire protection devices, fire pull boxes, sprinkler heads, etc. The Contractor will be responsible for insuring all the building systems devices are correctly placed so that the FFE is fully coordinated for access. The FF&E shall also be fully coordinated with the Customer's equipment requirements.

6.3.1.2 Contractor's Interior Designer shall conduct in-depth customer interviews to determine the actual and specific requirements. Based on customer in-put, the FFE shall include space planning with comprehensive furniture placement plans, selection of all furniture and furnishings with all associated fabrics and finishes and development of illustrated furniture order forms to allow accurate procurement from sources that have current General Services Administrative (GSA) Federal Supply Schedule (FSS) contracts for the specified items. The FFE for movable furnishings shall demonstrate complete coordination with every aspect of the building related designs and finishes.

6.3.2 The FFE shall be formatted as indicated in Chapter 10 Interior Design of the Mobile District Design Manual.

6.3.3 FFE items designated for contractor procurement shall be purchased by the Contractor from sources that have current General Services Administration Federal Supply contracts, in accordance with the Federal Acquisition Regulations (FAR) Part 8 Required Sources of Supply and FAR Part 51. In addition to the cost of the moveable furnishings, all of the Contractor's administrative costs associated with procurement and coordination and all labor cost associated with receiving, staging, installation (including hardwire, voice and data connections if required), adjustments/leveling, trash removal/disposal, and touch-ups shall be included in the total price of the FFE.

6.3.4 The final cost for the moveable furniture specified in the FFE shall be determined during the design phase of the Design Build project delivery process. The final cost estimate shall show pricing in accordance with the following line items:

a. Totals of all the FFE items.

b. Freight costs

c. Installation cost of all FFE (moveable furniture items)

d. Local Sales tax, if applicable

e. Contractor's complete administrative costs associated with ordering and coordinating/managing the turnkey FFE package.

For each CID submittal required during the design phase of the project, each cost shall be reported as separate line items in the cost summary.

6.3.5 Quality Standards for FFE Items

Customer preferences shall be considered making product recommendations, in addition to product quality. If revisions to the FFE requirements in Section 01 10 10 are required, the Contractor's Interior Designer shall also consider the factors below to choose the item(s) which overall will provide the best value, to insure a "best value determination" has been made for this project. Items selected and currently listed on a GSA contract have been determined to be the quality level acceptable by the Government. FFE items not currently on a GSA contract have no basis for determining quality and cost and will be not acceptable for this project. The following best value determination checklist shall be edited and used to evaluate a GSA contract source and shall be submitted in the CID package to justify the revised FFE selections.

BEST VALUE DETERMINATION CHECKLIST

a. Special features, which are required in effective program performance that are not provided by a comparable item.

b. Trade-in considerations

c. Probable life of the item selected as compared with a comparable item

d. Warranty considerations

e. Maintenance availability

f. Past performance (i.e. experience)

g. Environmental and energy efficiency considerations

h. Comfort/suitability of the item

i. Delivery time

j. Administrative costs

k. Training needed or provided

l. Technical qualifications

m. Compatibility with existing furniture/product/technology (circle one)

n. Other specify):_____

6.3.6 Compliance Verification

If revisions to the requirements in Section 01 10 10 are required, compliance with the FFE Description and FFE Requirements shall be determined by the government review of the design, drawings, specifications and construction submittals. Submittal shall be as indicated in Chapter 10 Interior Design of the Mobile District Design Manual.

6.3.7 FFE Implementation Schedule

If Bid Option Nos. 22, 23, 24, and 25 are awarded, the Contractor shall submit a FFE Implementation Schedule with set benchmark dates for the procurement and installation of the FFE items. The Contractor shall fully coordinate the construction schedule with the FFE Implementation Schedule.

6.3.8 FFE Installation Requirements

All FFE items and furniture systems in base bid items #1, #2, and #3 shall be installed in accordance with the manufacturer's instruction and by the manufacturer's certified installer to insure the warranties are not void. All FFE items shall be level and aligned so that all items are complete, usable and in working order. All FFE items are to be touched up, dusted and left in clean condition.

6.4 Concept Design (35% Phase)

6.4.1 This submittal shall capture the minimum level of work for 35% of the total design effort in all disciplines. The D-B Contractor will present this package to the Contracting Officer at the start of the review period. A corrected version of the Concept Design Submittal shall be submitted after the review conference has concluded. Participation from each design discipline, to include the lead design professional, who meets the minimum qualifications established in accordance with the RFP and has been identified in the D-B Contractor's proposal, will be required.

6.4.2 The minimum requirements of this submission are the same as described for a Concept Design Submittal in UFC 4-510-01. The purposes of this submittal are to present the design analysis with narratives, calculations, tabulations, sketches and drawings, a listing of discipline specific UFGS specifications which are expected to be required, and any other supporting documentation to fully substantiate the design and to document all major and design decisions to assure a completely workable Concept Design has been developed for the project. This is considered a technical submission and all issues regarding constructability, phasing, or similar features must be resolved. The following are the minimum requirements for the 35% Phase.

6.4.3 Prepare Confirmation Notices in accordance with these criteria.

6.4.4 Prepare an executive summary (in addition to the other submittal requirements) to include design intent, proposed architectural engineering systems, any phasing plans, scope, and a general description of the project with sufficient detail to provide an overview of the project. The executive summary shall either be bound separately for hospital-type projects or shall be included as a separate chapter in the Design Analysis for other medical projects. See Appendix B in UFC 4-510-01.

6.4.5 Prepare a design analysis, including narratives, calculations, and other supporting features (e.g., sketches and diagrams), in accordance with this section to document the development and evaluation of the design for this particular project.

6.4.6 Site/Civil Design:

a. The Site/Civil Design Narrative shall discuss all aspects of design as developed. Confirm availability of adequate capacities of site utilities or provide descriptions, and related costs, of necessary modifications to provide adequate capacities.
b. At a minimum, prepare plans showing building location, future expansion, existing and proposed structures/site improvements, topography, utilities including communications (voice, data, TV), roads, parking, landscaping, demolition, grading, lighting, erosion and sediment control, contractor's lay down area, traffic control,

and any other features including calculations essential to the delivery of this project.

6.4.7 Architectural Design:

a. The Architectural Narrative shall address overall architectural concept including interior finishes (in accordance with Appendix A of UFC 4-510-1), exterior finishes (in accordance with Installation Design Guide, if applicable), wall systems, roofing systems, acoustics, floor-to-floor heights, contingency and mobilization features, energy conservation features, accessibility provisions, functionality, and circulation. Include a description for the parameters, guidance, requirements and codes relevant to the design for accessibility as well as wayfinding and signage.
b. Prepare floor plans showing design in sufficient detail to allow an in-depth technical review.
c. Show all programmed spaces, corridors, structural grid system(s), columns, electrical/mechanical/communications/specialty rooms and stairs/elevators and other conveyance systems to meet the functional requirements on each floor. All spaces must be labeled with the room name, room code from the authorized PFD and the programmed and designed net areas.
d. Develop exterior elevations and major building sections to provide sufficient information and detail to allow an in-depth technical review.
e. Prepare reflected ceiling plans for all spaces to indicate ceiling grid system(s), light fixtures and HVAC supply and return grilles, speakers, ceiling-mounted communications equipment, special ceiling finishes, changes in ceiling heights, special lighting features, strobes, annunciators, and any other equipment or devices proposed to be located at the ceiling level.
f. The Concept Design Submittal, the Interim Design Submittal, and Final Design Submittal shall each include a complete room-by-room equipment and casework schedule identifying the Logistics Category (Log Cat) [http://www.hq.usace.army.mil/cemp/MDCTW/Docs/LOG-CAT.doc] of each equipment and casework item; all Log Cat A, B, E, F and G items and any Log Cat C items requiring unique utilities and/or structural support; and, utility requirements. Prepare the following for submission as well.

    1. Prepare a description for the parameters, guidance, requirements and codes relevant to the design for medical equipment and casework.
    2. Medical and laboratory equipment floor plans. Provide plans showing Log Cat A, B and E items with heavy, solid lines and showing Log Cat C, F and G items with dashed lines. Provide Joint Schedule Number (JSN) identification for Log Cat A, B, E, F and G items (except for JSN identification shown on medical equipment elevations), Log Cat C items requiring unique utilities and/or structural support, and Log Cat C items shown for verification of spatial arrangement and/or capacity. Medical equipment floor plans at minimum scale 1:50 (1/4 inches = 1 foot) are required for the entire facility. Typical plans for repetitive layouts may be included.

    3. Medical and laboratory equipment elevations. Provide medical research equipment elevations at minimum scale 1:50 (1/4 inch = 1 foot) showing mounting heights and locations for all wall-mounted items using a typical location and height elevation, a

typical wall elevation, or a specific wall elevation. Provide JSN identification for Log Cat A, B, E, F and G items and Log Cat C items requiring unique utilities and/or structural support (if not shown on the equipment plans).

4. Medical and laboratory equipment data sheets and catalog cuts. Provide these for all Log Cat A, B, E, F and G items and any Log Cat C items requiring unique utilities and/or structural support.

6.4.8 Structural Design:

a. The Structural Design Narrative shall discuss basis of design, loads assumptions, allowable unit stresses, ATFP considerations, and seismic design provisions (as applicable). Narrative shall include calculations.

6.4.9 Seismic Protection:

a. The Seismic Protection Narrative shall describe seismic bracing, restraint and protection features to be provided for non-structural building systems and installed equipment.

6.4.10 Heating, Ventilating and Air Conditioning (HVAC):

a. The Heating, Ventilating, Air Conditioning Narrative shall describe or include the following.

1. Design intent and basis of design. Describe all aspects of HVAC design including a summary of building loads and service demands and the considerations that went in to system and equipment selection. Describe all sources of HVAC and utility services. Describe the approach to equipment sizing, including for ductwork and piping, in terms of equipment redundancy, duct/piping velocity limitations, pressure loss per unit of length and other related design parameters.
2. Proposed HVAC control system and the required extent, if any, of interface with any medical facility-wide or installation-wide Utility Monitoring and Control System (UMCS).
3. Catalog cuts with dimensional and performance data for the major equipment upon which preliminary establishment of mechanical room space has been based. For air handling units, include data from at least two manufacturers, including data for all major components.
4. Anticipated acoustical treatment requirements (structural/airborne transmission and duct-borne noise), including silencers, duct lining and other acoustical insulating materials as needed. Reserve space in fan rooms for supply fan attenuation, unless preliminary calculations clearly indicate this will not be required.
5. HVAC Air Balance Summary Table listing each conditioned or ventilated room or space showing the required maximum and minimum airflow rates to meet conditioning and ventilation requirements, relative pressurization, and whether room or space air is returned or exhausted. See Air Balance Form for format.
6. Seismic design elements and aspects of the HVAC design. If piping systems subject to thermal expansion must be seismically braced, describe the approach to coordinating the design of piping

supports and thermal expansion equipment with provisions (including anchors, guides, "ells'" offsets, etc.) for seismic bracing.

7. Water treatment requirements for chilled water, heating water, or steam generating systems or equipment. Describe design features for the control of legionella bacteria.
8. Results of calculations for building energy modeling and for HVAC loads shall include room-by-room, block (per air handling unit), and building heating and cooling design loads or demands for the project. Cooling loads may use "rules of thumb" for individual room lighting and equipment loads at this stage of design. The designer is advised; however, any calculations showing occupied space airflow "engineering check figures" of less than 5-6 L/s/m^2 will be scrutinized.

i. Sizing information for major equipment.
ii. Relative humidity level projection calculations may be deferred to final design, providing the designer reserves adequate space in air handling equipment rooms to accommodate in-unit or in-duct humidifiers if later proven to be required.
iii. Fan noise duct-transmission/attenuation calculations may be deferred to final design if the designer reserves adequate space in air handling equipment rooms to accommodate noise attenuators if later proven to be required.

b. Provide single line dimensioned distribution drawings for all ductwork, and for the main heating, chilled water, and steam services, throughout the facility. Provide schematic diagrams for all piping systems. Identify all HVAC control zones; provide locations and sizes of storage and prime moving equipment for all systems; provide locations of all outside air intakes and exhaust air discharge points. Provide complete equipment room drawings (including fan rooms) in plan and elevation showing major equipment of all disciplines including architectural and structural elements, and depict the required access, maintenance, and NFPA 70 dedicated space requirements.

6.4.11 Plumbing:

a. Comprehensive description of design intent and basis of design. Describe all aspects of the plumbing and medical gases/compressed air/vacuum design, including a summary of service demands with the considerations that went into system and equipment selection. Explain the sources of all utility services. Describe the approach to equipment sizing, including for piping, in terms of equipment redundancy, piping velocity limitations, pressure loss per unit of length and other related design parameters.
b. Catalog cuts with dimensional and performance data for the major equipment upon which preliminary establishment of mechanical room space has been based.
c. Table showing all medical gas, compressed air and vacuum outlets by room. Determine (with the Using Service) the required type and number of medical gas services using Appendix A of UFC 4-510-01 and the Medical Design Templates.
d. Description of seismic design elements and aspects of the plumbing/medical gases design. If piping systems subject to thermal expansion must be seismically braced, describe the approach to coordinating the design of piping supports and thermal expansion

equipment with provisions (including anchors, guides, "ells'" offsets) for seismic bracing.

e. Water treatment requirements for domestic water, or steam generating systems or equipment. Describe design features for the control of legionella bacteria.
f. Results of calculations of plumbing (including medical gas, compressed air and vacuum) design loads or demands for the project and sizing information for major equipment.
g. Include main plumbing piping routing including riser diagrams and sizes for all systems and provide locations and sizes of storage and prime moving equipment for all systems. Provide complete utility equipment room drawings in plan and elevation showing major equipment of all disciplines, including architectural, and structural elements, and required access, maintenance, and NFPA 70 dedicated space requirements.

6.4.12 Electrical Systems:

a. Description of the power and lighting design to include the service, transformers, connections interfaces, power distribution centers and distribution systems to be used throughout the project; essential electrical system and subsystems; alternate power sources; lighting systems; isolated power systems; X-ray power system; grounding system for patient care; lightning protection system; corrosion control; electrical seismic requirements; and special requirements for selected areas.
b. An analysis of the Electrical Systems and Equipment Section with Life Cycle Cost Analysis, where applicable, alternative systems or equipment considered and rejected, and justification for that selected. Prepare a rationale for selection of reduced voltage starting, power factor correction and power conditioning equipment.
c. Energy Impact Analysis (or statement of all equipment or systems considered).
d. Work phasing plan.
e. Calculations for normal and emergency power systems. Load calculations for determining ratings of transformers, generator capacity (if applicable), switchboards, automatic transfer switches, motor control centers, and power distribution panels. Load calculations shall be based on watts per square meter for lighting, small appliances and medical equipment except sterilizers.
f. Lighting Criteria Schedule: All areas shall be listed numerically, with room names, criteria illumination levels (maintained and initial illumination levels) for general and task lighting, and type lamps (with color rendering index, and color temperature). Repetitive areas may be cross-referenced. Note special design features requirements.
g. Lighting calculations for typical rooms and typical exterior areas.
h. Preliminary short circuit calculations, power system short circuit analysis.
i. Voltage drop calculations as necessary to support system or wiring method chosen.
j. At a minimum, the electrical plans shall identify the electrical legend, list of abbreviations, site plans with the primary distribution, site lighting, and equipment location and layout; the location and layout of all electrical rooms including closets; lighting fixtures and switching; general purpose receptacles and special receptacles and outlets for equipment rooms; power one-line

diagrams and interface connection points; grounding one-line diagram including power, communication, and lightning protection system bonding; lightning protection plans with details; lighting fixture schedule (Including lamp types, color rendering index, and color temperature); point-to-point power and lighting wiring for each typical room and area; and typical panel schedules.

6.4.13 Electronic Systems:

6.4.13.1 The Electronic Systems Narrative shall describe the design history, purpose, operational features, configurations, logistical responsibilities, interfaces with existing and other systems, and established locations of each communications system.

a. Provide a list of contacts from all offices and agencies with which the CSE has coordinated the design. Provide contact information for each individual on the list.
b. Prepare and submit an initial Telephone Station Requirements Matrix (TSRM). While each row of this matrix shall be used to identify each room (or space) in the project, columns shall be used to indicate (in each row) an accompanying room number and description; numbers and types of outlets; numbers and types of lines and instruments; and, telephone features package.
c. Prepare sizing calculations/rationale for all communications rooms, raceways, service entrance conduits, risers and trunk cables, PA and TV amplifiers.
d. Prepare and submit calculations to support the selection of cable sizes and types for both outside plant and inside plant risers and to support the sizing of PA amplifiers and CATV amplifiers as well as the cable tray selected and all conduit sizes selected and used.
e. At a minimum, the Communications Specialist shall provide, for each communications system, riser diagrams for selected zones; identification and associated proposed location for each major item of equipment; and, identification of cable sizes and types and termination equipment. Provide site utility plans for voice, data, security and television (TV) systems indicating any and all communications ductwork, manholes, hand-holes, and cable routing required to tie the new facility into the existing installation-wide networks/systems. Indicate all existing communications cables on, or adjacent to, the immediate project site. Identify all symbols and abbreviations utilized in the plans. Provide floor plans at a minimum scale of 1:50 showing the locations of all communications systems outlets. Outlets shall include all systems devices for interface such as nurse call pull cord and push button stations, public address speakers, TV outlets, etc. Identify room numbers and names as well as the outlines of equipment and furniture on the floor plans without the equipment [JSN] numbers. In lieu of the floor plans described above (in this paragraph), it is acceptable to provide typical drawings for each room type in the facility showing locations of each outlet for the communications system with room name and number and outlines of furniture and equipment.

6.4.14 Fire Protection:

6.4.14.1 Prepare a fire protection/life safety design analysis (FPLSDN) in accordance with Section 1-4 of UFC 3-600-01 to evaluate the life safety provisions and fire protection features (minimum of 16 factors) in terms of

what is required and what will be provided to accommodate the scope of the work for this project along with a drawing, or set of drawings, to support this analysis (in the form of a narrative). Utilize the following requirements to further clarify the preparation of the narrative.

a. Identify applicable criteria and note the edition with each reference. Provide a description of use to support the designer's determination of the occupancy classification(s) in accordance with NFPA 101 and the use and group classification(s) in accordance with IBC for all fire areas and smoke compartments of the proposed facility. Also, address the use of the Integrated Building System (IBS), high-rise provisions and any other features impacting the fire safety/protection design (as applicable).
b. Describe subdivision of building spaces with identification of all fire separations and smoke barriers required by either the IBC or NFPA 101.
c. Address interior wall and ceiling finish and interior floor finish identifying classification and flame spread and smoke-developed ratings and extent of plastics to be provided as finish materials.
d. Describe protection of vertical openings, including enclosure requirements for stairs, elevators, escalators, conveyors, dumbwaiters, chutes, atriums, malls, and light wells (as applicable).
e. Identify types and numbers of exits; capacity, and arrangement of the means of egress; performance parameters of the means of egress, like for common path of travel, dead-end corridor, and total travel distance; discharge from exits; exit marking and illumination of means of egress; emergency lighting; and, special security features.
f. Identify FAMNS and voice communication requirements for field devices, central equipment and installation reporting systems with a description of the central station fire alarm reporting system. Indicate facility operations that impact selection of FAMNS with consideration given to type of evacuation, patient and staff evacuation procedures, and layout of smoke/fire compartments. Include functional description of alarm initiating and alarm indicating requirements, signaling circuits and appliances, circuit performance styles, sequences of operations, annunciation of alarm and supervisory signals, and interface with building and fire protection systems. Indicate system configuration (e.g., conventional hardwired, addressable, multiplex, intelligent) and type of signal communication (e.g., digital or analog). Indicate FAMNS requirements as they relate to other building systems, e.g., HVAC.
g. Describe available primary and secondary water supply and water storage requirements. Include types and locations of system equipment, design criteria, and preliminary building fire flow demand and water duration. Provide a copy of the most current hydrant flow test report as an attachment to the FPLSDN.
h. If water flow test results support a fire pump and/or tank installation, indicate design criteria (e.g., NFPA 20), equipment type, arrangement, and capacity and pump ratings. Include pump equipment power, alarm and supervision requirements, automatic and manual fire pump control requirements, and FAMNS interface and supervision requirements.
i. Identify objective and scope for smoke control and/or smoke management in the project, particularly the relevant performance criteria that the FPE DoR intends to meet. Indicate the type(s) of

smoke control and management proposed to meet criteria. Identify building systems that must be interfaced to provide smoke management. Summarize design considerations, control parameters and operational features.

j. Identify layout and distribution parameters for fire extinguisher cabinets.

k. Elaborate upon facility features for emergency power distribution, including control and switching requirements for life safety, critical and equipment loads with load shedding and restoration features (as applicable).

l. Consider each of following special hazards and features, which may impact the overall level of fire protection being provided.

(1) Security (e.g., electric door releases, door hardware, and locking arrangements)
(2) Malls/atriums
(3) Automatic data processing and electronic facilities
(4) Elevator control/FAMNS interface
(5) Emergency power
(6) Emergency vehicle easements
(7) Explosion prevention
(8) Flammable and combustible liquids handling and storage
(9) High-frequency electrical equipment
(10) Hyperbaric and hypobaric facilities
(11) Medical gas and vacuum systems (compressed)
(12) Medical gas handling and storage
(13) Radio Frequency Interference (RFI) shielding
(14) Underground structures/areas, including crawlspace(s)
(15) Waste handling (medical and hazardous)
(16) Limited-access structures or areas
(17) IBS Design (interstitial floors/areas/spaces)

m. Prepare the following calculations.

1) Exiting calculations per NFPA 101, including occupant load, exit width, exit and exit access capacity (number of people per exit), remoteness of exits, and exit passageway and convergence capacity. For "total" evacuation of high-rise facilities, provide occupant egress flow-time calculations per NFPA 101A.

2) Hydraulic calculations per UFC 3-600-01, NFPA 13, and NFPA 14 (as applicable) for the sprinkler or combination sprinkler/standpipe system when complete system design is required. The hydraulic calculations shall be accompanied by a drawing(s) identifying the hydraulic pipes and nodes. For performance designs, provide a set of preliminary calculations for the assessment of system demand, including (but not limited to) end head flow and pressure, flow increase due to balancing, system friction loss, and hose stream allowance with associated pressure loss.

3) Calculations for required volumetric water storage capacity and for pipe line sizing per UFC 3-600-01 and NFPA 22.

4) Calculations to verify the available water supply can meet the required waterflow and pressure demand of the sprinkler and/or combination sprinkler/standpipe system(s). Investigate

capability of existing water storage and duration to meet the demand of the proposed system.

5) If a fire pump is required, provide fire pump/booster pump sizing calculations per UFC 3-600-01 and NFPA 20. Design pump(s) capacity between 125%-140% of capacity for a standard size pump.

n. At a minimum, the plans to graphically represent fire protection features and life safety provisions shall identify the following. As appropriate, indicate both the minimum requirement and the actual provision being incorporated into the project.

o. Prepare life safety/building code composite plans (minimum scale 1:100 or 1/8 inch = 1 foot) utilizing a set of architectural floor plans with room names and numbers, clearly identifying horizontal and vertical means of egress, any vertical openings, such as elevators and other shafts, utility rooms, and structural support elements. The following shall be indicated: occupancy classification and sub-classification per NFPA 101 and Use-Group Classification per IBC of all fire areas; delineation of smoke compartments (or barriers); location of all fire-rated separations, including fire-rated door assemblies and dampers with specific fire-resistance ratings identified; number and locations of all required exits, exit capacities (number of people per exit), means of egress and travel distances (IBC) of all fire areas and smoke compartments. Identify performance parameters of the means of egress, including proposed measurements and maximum limitations of travel distance, common path of travel, and dead-end corridor, on each floor and compartment, as well as the specific location where each measurement was taken. It is noted that any travel distance measurements shall be taken both to an exit and to a smoke barrier (where smoke compartments are code-required), as required by NFPA 101. Utilize egress tags at each interior exit to a vertical component of egress, like a stair, and at each exterior exit from the facility, which shall each identify the following four parameters: (1) minimum clear width required, (2) actual clear width proposed, (3) calculated maximum number of occupants that the particular component is capable of serving, and (4) actual number of occupants anticipated to use that particular component based upon a reasonable distribution of occupants performed by the FPE DoR.

p. Prepare fire suppression plans to graphically represent locations of all areas protected with automatic sprinklers, clearly identifying system, type, sprinkler hazard classification, and respective sprinkler design densities. The zoning of automatic sprinkler protection shall be coordinated with the building smoke compartments, where applicable, and shall indicate locations of other areas protected by other automatic extinguishing and suppression systems.

q. Prepare fire alarm/fire detection/mass notification plans to graphically represent locations of all FAMNS control and annunciation panels; all connections for notification, monitoring and control; all FAMNS initiating and indicating circuits and locations of connected devices, including control of respective HVAC units for either smoke control (see NFPA 90A) or smoke management or both.

r. Prepare composite drawings showing life safety provisions and fire protection features that need to be resolved early in the design process to prevent unnecessary and unwanted changes later in design.

s. Prepare floor plans and sections to identify IBS (distribution zone) at each level, (if IBS is provided as a betterment), in accordance with UFC 4-510-01.

6.4.15 Anti-Terrorism/Force Protection:

a. Prepare a description for the parameters and the major features of the design to address physical security.
b. Prepare a description for the parameters, guidance, requirements and codes relevant to the design for Antiterrorism/Force Protection.

When would we include any draft LEED documents or scoresheet?

6.5 65% SUBMITTAL

*****DO WE WANT TO MAKE THE MED/SURGE ROOM MOCK-UP GO RIGHT HERE?? If SO, HOW DO WE WANT TO DESCRIBE IT TO OUR DB CONTRACTOR/A-E #2******
That is probably prudent considering acceptance of the final design is contingent upon the mockup. My thought is that the 65% mockup will be full-size but with cardboard cutouts of the bed, furniture, fixtures, and medical equipment. It would be further developed and refined at the next submittal. I'm not sure if an actual mockup with actual furniture and equipment is doable. This probably warrants a separate telecon with the PDT and VA CFM to discuss the purpose and expectations.

6.6.1 This submittal shall expand upon the technical aspects of the Concept Design and related design/engineering decisions made and shall capture the documentation necessary to demonstrate a level of effort commensurate to represent 65% of the total design effort in all disciplines. USACE and the Using Service will conduct a comprehensive technical review to ensure conformance with the RFP. Fully edited UFGS Specifications (in marked-up format) shall be submitted.

6.6.2 Update previously submitted executive summary in accordance with UFC 4-510-1. Provide as a separate volume. Summarize discipline-specific narratives and the site plans.

6.6.3 Paving, Grading and Drainage:

6.6.3.1 Provide the following drawing information as a minimum:
1. Existing layout – horizontal control.
2. Demolition plan(s).
3. Layout plan(s) showing circulation, building expansion, detail plans.
4. Grading plan(s), detail plans.
5. Pavement layout plan(s), profiles, details.
6. Utilities plan(s), details
7. Provide UFGS marked-up specifications supporting work in these categories.

6.6.4 Water Supply and Sanitary Sewer

a. Provide drawings, narrative and supporting documentation incorporating work as shown for an interim submittal in the Mobile District Design Manual.
b. Provide UFGS marked-up specifications supporting work in this category.

c. The submittal shall contain the design narrative and design calculations for the water and wastewater systems relating to this project. Include an analysis showing the required size of all components of the water supply and distribution system. The design narrative for wastewater systems shall show calculations for sewage flows, pipe sizes, and capacities. The narrative shall discuss anticipated permit requirements for water and wastewater features. Identify any deviation in the design from what was originally proposed and provide reasons and justifications for the deviation.

d. The Contractor shall perform a fire protection design analysis in accordance with UFC 3-600-01. The Contractor shall provide the services of a qualified fire protection engineer who shall be an integral part of the design team and shall be involved in all aspects of the design as it relates to fire protection, in accordance with UFC 3-600-01.

e. The Drawings shall show, in plan, the anticipated water distribution and sewage conveyance systems and layout. Standard details shall also be included.

f. The Contractor is encouraged to include manufacturer's catalog cuts and descriptive information in the submittal. (Manufacturer's trade names are allowable on the drawings and in the specifications.)

g. Fire pump for fire protection drawings and design analysis shall be 100% complete by the 50% submittal.

6.6.5 Environmental

6.6.5.1 The Contractor shall provide a marked-up UFGS 01 57 20.00 10, Environmental Protection specification. The Contractor shall provide a list of all permits that are required to be obtained and any associated fees. The Contractor shall ensure that required environmental permits are obtained prior to start of construction and/or installing or operating any new or modified equipment or processes. In addition to Environmental Permits, based upon information provided by the BCE, the Contractor will determine when Installation specific permits are required, such as digging, communications, and security.

6.6.6 Landscape

a. Provide drawings, narrative, and supporting documentation incorporating work as shown for an interim submittal in the Mobile District Design Manual.

b. Provide marked-up specifications supporting work in this category.

6.6.7 Geotechnical Investigation and Design:

a. Provide Geotechnical Report, narrative, and supporting documentation incorporating work as shown for an interim submittal in the Mobile District Design Manual.

b. Provide marked-up specifications supporting work in this category.

6.6.8 Architectural Design

a. Provide drawings, design analysis, and supporting documentation incorporating work as shown in the Mobile District Design Manual.

b. Provide marked-up specifications supporting work in this category.

c. Provide the following drawing information as a minimum:

1. Composite floor plans – largest scale to fit on one drawing sheet.
2. Floor plans showing all floors, circulation, rooms and spaces with titles and numbers; omit room codes from Program for Design, and programmed and as-designed net areas.
3. All exterior elevations and major building sections, identify construction materials.
4. Reflected ceiling plans and details including acoustical treatment, ceiling mounted speakers and strobe lights.
5. Room finish schedule(s).
6. Roof plans and details.
7. Interior elevations.
8. Toilet room plans, elevations and details.
9. Door schedule(s).
10. Window and glazing schedules and details.
11. Wall sections and details.
12. Partition types and details including acoustical treatment.

d. Update/Expand upon previous information and provide plans and elevations for medical equipment and casework showing all Log Cat A, B and E items and any Log Cat C and F items requiring unique utilities, structural support and/or verification of spatial arrangement or capacity. Show Log Cat A, B and E items with solid lines and Log Cat C and F items with dashed lines. Provide Joint Schedule Number (JSN) identification for all Log Cat A, B and E items and any Log Cat C and F items show.

1. Medical and scientific research equipment specifications. Generic specification sections will not be permitted and will be returned immediately to the D-B Contractor for re-submission. Complete specifications for medical equipment and casework items shall be prepared for all Log Cat A items and generic descriptions with detailed installation specifications for all Log Cat B and E items. JSNs shall be used to reference each item on the drawings and in the specifications.
2. Medical and scientific research equipment and casework details. Prepare details to show special supports, mountings, and required utilities to be provided by the D-B Contractor for all categories of medical and scientific research equipment and casework.

6.6.9 SID

All SID proposals shall be reviewed and approved by the Government. The Government shall return the SID packages to the Contractor after the review for updating and incorporating review comments. Unless noted otherwise, room finishes shall be planned and identified in accordance with Appendix A of UFC 4-50-01, with any variations noted in narrative. Each submittal will follow this method of review until the Government approves the completed SID package. The Submittals shall be side marked and distributed as follows: 1. EN-DA Mobile District Office; 2. CD-GE 3. Installation 4. User and 5. Base Contracting.

6.6.10 Structural

a. Provide drawings, narrative, and design analysis to include calculations and supporting documentation incorporating work as shown for an interim submittal in the Mobile District Design Manual.
b. Provide marked-up specifications supporting work in this category.

6.6.11 Integration of Building Systems:

a. For projects incorporating Integration of Building Systems (IBS) Design, provide the following.

1. Multi-disciplinary plant and equipment room plans and elevations at 1:50 (1/4'-1') scale to graphically represent all primary equipment and distribution elements (piping, cable tray, ductwork, and fittings - dimensioned); structural and architectural elements affecting space availability; and, space required for equipment maintenance, operation (including straight duct runs for air measuring stations, sound absorbers, and humidifiers), replacement, and electrical code clearances. Show at least two elevation views of air handling units. Where equipment in existing plant or equipment rooms is significantly altered or expanded under these projects, drawings and elevations shall also depict existing equipment.

2. Cross-sectional views to show typical above-ceiling and utility chase equipment (ductwork, piping, conduit, cable tray, terminal equipment), at "choke points" or congested locations.

3. Cross-sections shall show all mechanical, fire protection, electrical, communications, structural, and architectural elements at that location in sufficient scale and detail to show that installation, change-out, maintenance, access, and cooling air circulation space requirements are met.

4. Dimensions indicated for ductwork and piping shall be take into consideration space needed for joining, reinforcement, and support requirements (including seismic bracing, if applicable), and include allowances for insulation.

5. Approximate duct/piping dimensions for branch feeders for which sizing calculations have not yet been performed.

6. Consider realistic elevations of drainage and vent piping, reflecting properly sloped installation. Include a detail of one roof drain and, if a two story facility, one soil stack turndown, to show the required clearance for installation.

7. Show adequate separation between outdoor air intakes and contamination sources, and means of access for equipment inspection, repair, or replacement.

6.6.12 Plumbing

a. List all references used in the design including Government design documents and industry standards.

b. Provide justifications and brief descriptions of the types of plumbing fixtures, piping materials and equipment proposed for use.

c. Provide detailed calculations for the sizing of the following systems:

Domestic cold water piping
Domestic hot water piping
Compressed air piping
Waste and Vent
Water heating system
Natural gas distribution
Roof Drainage System
Medical Gases
Vacuum Design

d. Provide pipe layouts and risers for each plumbing system listed above. Included equipment and fixture schedules with description, capacities, locations, connection sizes, and other information as required.

e. The design analysis, submitted for review shall consist of the following:

1. Design Narrative to include applicable design assumptions, sizing methods chosen, and why.
2. Design Calculations.
3. Drawings – coordinate with plans that depict IBS design to avoid drawing duplication.
4. Catalog cuts of equipment such as water heaters, backflow preventers, and plumbing fixtures.
5. Table showing all medical gas, compressed air and vacuum outlets by room. Required type and number of medical gas services shall be as determined by the Using Service using Appendix A of UFC 4-510-01 and the Medical Design Templates.
6. Description of seismic design elements and design aspects of the plumbing/medical gases design.
7. Discuss water treatment requirements for domestic water, or steam generating systems or equipment. Describe design features for the control of legionella or other bacteria.

f. Drawings shall be complete with legends, floor plans, schedules section, details and risers diagrams.

g. Prepare detailed calculations for systems such as sizing of domestic hot water heater and piping; natural gas piping.

h. Indicate locations and general arrangement of plumbing fixtures and major equipment.

i. Include plan and isometric riser diagrams of all areas including hot water, cold water, storm drain, waste and vent piping. Piping layouts and risers should also include natural gas (and meter as required), and other specialty systems as applicable.

j. Include equipment and fixture schedules with descriptions, capacities, locations, connection sizes and other information as required.

k. Include marked up UFGS specifications of materials and methods.

l. Plumbing (including gas, air, and vacuum) piping systems. By schematic or riser diagram, indicate relative system locations of all major medical gas system components, including isolation and zone shutoff valves, and sensor locations for master and area alarms.

m. DDC system "architecture" (Input/output table, controls diagrams).

6.6.13 Fire Protection:

a. The fire protection engineer qualifications shall be submitted to and approved by the Contracting Officer certifying that the design engineer is a registered fire protection engineer or a registered professional engineer with a fire protection background and at least four years experience in fire protection/detection design.

b. Certificates shall be furnished to certify that the sprinkler system designed for the buildings in this project complies with the material and fabrication requirements of this specification.

c. The design analysis shall consist of the design narrative, design calculations, and drawings as specified in the Design Criteria such as the fire protection and life safety drawings. Update the approved FPLSDN from the Concept Design Submittal and expand upon the information indicated, as necessary, to meet the level of effort identified herein to reflect the Interim Design. Add a section entitled "Approaches and Concerns" to the narrative portion of the FPLSDN, to document any issue, such as a deviation from,(or a waiver to) established criteria, conflicts in criteria, or any other issue that presented itself during design development and could impact the successful delivery of this project. Update the presentation of previous sets of calculations, such as for occupant load and exit capacity. Address all fire protection features and life safety provisions proposed to be incorporated into the project, including (but not limited to) the following areas of concern.

   1. Fire alarm/fire detection/mass notification, including sequence of operations for activation, monitoring, control, and interface of other systems and equipment.
   2. Water supply and storage systems and automatic sprinkler and standpipe systems, including tanks, pumps, and controllers.
   3. Automatic and manual means of fire suppression.
   4. Automatic and manual means of fire extinguishment.
   5. Smoke control/exhaust systems and controls (interface/connection of FAMNS/EMCS), including all modes of operation, e.g., normal, emergency, failure and supervisory, monitoring and control modes.

d. Drawings shall not be smaller than the scale used for architectural floor plans. Drawings shall provide the information required by

NFPA 13 and any additional requirements as stated in the Design Criteria. The drawings shall be submitted for review.

e. Develop composite life safety plans to ensure integrity of structural fire resistance using either of the following two approaches.

1. Keep composite plans in drawing package and use as reference for coordination of trades in systems installation to maintain structural fire resistance rating. The composite plans are provided for information only and will not be considered contractual.

2. Indicate fire resistance rating of membranes, walls, barriers, partitions, and any other assemblies on the architectural floor plans and provide a general note on all other discipline floor plans to reference fire protection requirements of barrier penetrations.

f. Provide details illustrating all construction materials contributing to the fire resistance rating for each construction element, membrane, or assembly. Details of fire-resistive design shall be identified on a separate drawing and titled appropriately for reference by all trades, e.g., partition types for fire-rated barriers or walls.

g. Drawings will detail method of attaching waterproofing membranes to sleeves passing through walls or floors that are subject to a static head of water.

h. If it is determined that fire pumping capability is required in this project, identify location of fire booster and jockey pumps as well as the associated pump controllers. Where fire pump(s) is (are) enclosed in a separate room, include a separate room layout of all supply and discharge piping, pumps, controller and accessory equipment, to ensure adequate space for installation, maintenance, inspection, testing and supervision. Installation of fire and jockey pumps includes layout of supply and discharge piping, valves, meters, testing devices, control equipment and any other related items required for proper operation. If it is required as part of this project, prepare a water storage design.

i. Prepare smoke management plans with schematic diagrams of interface features for building systems (HVAC/utility control/sprinkler/FAMNS) for smoke control and management functions and for the coordination of smoke control features. Prepare a coordinated layout of all smoke compartments with HVAC system layout, sprinkler zones, and FAMNS initiating and indicating circuits. Provide coordination and sequence of operations of controls for HVAC/smoke control outputs with FAMNS inputs. Provide a matrix to document the sequence of operations of fire alarm inputs and smoke control outputs.

j. Maintain fire resistive integrity as tested per ASTM E 814.

k. Locate or detail the following items on the contract drawings as applicable:

(1) Control valve locations.
(2) Type of sprinkler heads to be used.
(3) Required flagged pipe or mechanical grooved coupling connection locations and symbols.
(4) Wall and floor pipe penetration locations and details.
(5) Post indicator valve location.
(6) Pipe runs requiring freeze protection location and length to be protected.
(7) Fire department connections and water flow indicators locations and symbols.
(8) Mounting location for local water flow alarm facilities.
(9) Point of interconnection between alarm signal circuit and source of power shall be indicated on the appropriate riser diagram.

l. Submit marked-up technical specifications of materials and methods.

m. Fire protection shall be 100% complete by the 65% submittal.

n. Automatic Fire Suppression systems shall be supervised by the FAMNS.

6.6.14 Heating, Ventilating and Air Conditioning (HVAC)

a. Provide a 65% HVAC design review package to include the following items.

(1) 65% Design Analysis: The Design Analysis shall include the following items:

(a) Detailed calculations for the following: heating loads, cooling loads, piping, ductwork, equipment sizing, etc. Computer calculations shall include print out of input and output data. Summarize the results of all life cycle cost analyses and other economic analyses.

i. Update calculations for room-by-room, block (per air handling unit), and building heat gain/loss demand loads based on installed lighting and equipment, envelope heat transfer, occupants, required ventilation and all other factors normally considered in these calculations. Loads shall be determined by analysis of actual as-designed conditions for each individual space, not by "rules-of-thumb."
ii. Calculate room supply, return, ventilation or exhaust air requirements based on the heat gain/loss calculations, total and outside air change/ventilation requirements and temperature, humidity, ventilation and pressurization criteria for each room or space.
iii. Calculate duct and pipe main sizes, including risers and size the run-outs from the mains.
iv. Relative humidity level projection calculations may be deferred to final design, providing the designer reserves adequate space in air handling equipment rooms to accommodate in-unit or in-duct humidifiers if later proven to be required.
v. Calculate outside air ventilation rates for each space and air handling system, showing compliance with the most

stringent of Appendix A of UFC 4-510-1, exhaust makeup, or ASHRAE Standard 62-2001.

vi. Calculate airborne (duct-borne, duct breakout, equipment room breakout) noise generation and the necessary attenuation to maintain the specified room noise criteria levels. For duct-borne noise, as a minimum calculate noise transmission from the supply and return fans to the first room served by the respective system, including noise regeneration at terminal units. If the "first room served" experience noise problems, extend analysis to succeeding rooms.

vii. Provide room-by-room air balance sheet.

viii. Provide calculations to show that at minimum VAV air flow set points, the VAV will still deliver the total air required per room per Appendix A of UFC 4-510-10.

(b) Equipment selection: Equipment selection shall be based on manufacturers whose equipment meets project requirements for each item. The design analysis shall include catalog cuts of all major equipment (e.g., air handlers, coils, chillers, condensing units, boilers, pumps, fans, unit heaters, etc.) manufacturer, model number, dimensions, capacities, and electrical requirements. The project design is not complete until the designer is assured that there is sufficient physical space in areas where equipment is to be located to install and to maintain the selected equipment.

(c) Include any other information or calculations to verify that the design complies with applicable criteria codes or standards and is satisfactory for intended purposes.

(d) Explanatory notes shall be included in the design analysis covering all rationale for design which would not be obvious to an engineer reviewing the analysis. Methods of air conditioning and controls for air conditioning systems shall generally be confined to those in common use in the industry. Include HVAC air balance summary table. Discuss the means of acoustical control of noise generator by mechanical equipment through ducts and walls.

(e) Specifications: Marked-up specifications shall be submitted.

(2) 65% Drawings: The drawings shall show all information given on the concept drawings but in greater detail. Scale floor plans at minimum 1/8" per foot scale and mechanical equipment rooms and congested areas of energy plants at 1/4" per foot. The drawings should include, but not be limited to, the following items as applicable:

(a) Show all ductwork and piping, with sizes and flow rates, where necessary for balancing purposes. Indicate the ductwork pressures in accordance with SMACNA standards. Include all accessories and appurtenances.

(b) Show elementary ladder diagrams and temperature control schematics indicating remote sensors, panel mounted controllers, and thermostats.

(c) Show layout and details of the final version of all HVAC systems. The location, arrangement, capacity, and space requirements of all equipment shall be indicated. Selected zones of air distribution shall be sufficiently completed to indicate the solution of the design for the remainder of the system and the precautions taken to coordinate the design with the architectural, structural, and electrical phases of construction. Equipment room layouts shall be sufficiently complete to show piping and duct layouts and access for maintenance. Since equipment rooms represent the most congested areas for both equipment and piping, the following guidelines should be followed when drawings are being prepared.

(i) Pipe fittings and accessory details shall be shown.

(ii) All duct and fittings in congested areas and mechanical rooms shall be drawn to scale using double-line layouts. In a VAV system, ducts between the AHU and VAV boxes shall be double-lined and ducts downstream of the VAV boxes may be single lined.

(iii) All equipment shall be outlined to scale, and maintenance or removal space shall be indicated by dashed lines,

(iv) Removal and replacement space must be considered for the largest and heaviest equipment when a drawing is made.

(v) In other HVAC plans, sections, and details, these same guidelines shall apply.

(d) The final form of all equipment schedules shall be shown with preliminary equipment data filled in.

(e) In coordination with the IBS Design, show equipment room, plumbing fixture, and exterior equipment locations and layouts including all equipment and distribution elements for all disciplines, including architectural and structural elements, thermal insulation, dedicated space requirements (per NFPA 70), equipment maintenance and access space. Plans shall include a minimum of two elevation views for each major air handling unit and equipment room. Include existing equipment and equipment rooms included in project work.

6.6.15 Electrical Systems

6.6.15.1 Interior Electrical System

a. Narrative. In narrative, address the following to allow verification that the design complies with the requirements of the project. The design analysis shall include all calculations required to support design decisions and estimates at this stage of design. The analysis shall include specific criteria furnished, conference minutes, and cost analyses

of all systems considered. Verify compliance with electrical section of UFC 4-510-01.

(1) Indicate electrical characteristics (voltage, phases, and number of wires) for the electrical system.

(2) Provide a description of lighting systems(s) to be used for all areas, referencing calculations. Also, include tabulation showing the following:

(a) Rooms name and number.
(b) Lighting intensity for each room. State the basis for selection such as I.E.S., etc.
(c) Identify the type of fixture by manufacturers catalog cut.

(3) State the type of wiring system to be used, such as insulated conductors installed in rigid or intermediate metal conduit, insulated conductors installed in electrical metallic tubing, etc. and location of proposed use.

(4) Describe any special areas of design, such as equipment, receptacles, handicap requirements, seismic requirements, etc

(5) Define any hazardous classified locations by class, division, and group as defined by the National Electrical Code. Indicate the types of equipment to be used in these areas. State the reasons for the area(s) being hazardous classified locations.

(6) Provide a lightning risk analysis and describe the lightning protection system to be installed.

(7) Describe the type of grounding system planned.

(8) Describe the basic characteristics of panel boards, switchboards, motor control centers, and other major pieces of electrical equipment being provided. Short circuit and voltage drop calculations at all equipment with protective devices included shall be provided. Indicate equipment interrupting ratings and short circuit withstand ratings based on these calculations.

(9) Describe the electrical metering equipment to be provided.

(10) Provide a statement that no duct or liquid piping shall pass over and/or through any electrical space and/or room as defined by the National Electrical Code Article 384.

(11) Provide marked-up specifications supporting work in this category.

b. Drawings. In drawings, provide the following to allow verification that the design complies with the requirements of the project. Complete and independent checking of the design shall be accomplished by the Contractor. The Contractor is fully responsible for the design. The design shall be complete and accurate. It shall be thoroughly checked for errors and conflicts (both within and between disciplines). Refer to the requirements for integrated building systems (IBS) to avoid repetition.

(1) The power riser or one-line diagram shall be essentially complete except for finalization of conduit and wire sizes.

(2) Panel boards, switchboards, motor control centers, and all other utilization equipment shall be located on the floor plans. Schedules for applicable equipment shall be provided. The schedules shall include all pertinent information to fully describe the equipment. Elevations for free standing equipment shall be provided but need not be entirely finalized. Details of the layouts for electrical room and closets shall be shown.

(3) Branch circuits, lighting fixtures, receptacles, and switches, shall be shown with number of conductors indicated.

(4) A completed fixture schedule shall be included on the drawings.

(5) Lighting protection plans and details.

6.6.15.2 Exterior Electrical Distribution System:

a. Narrative. In narrative, address the following to allow verification that the design complies with the requirements of the project. The design analysis shall include all calculations required to support design decisions and estimates at this stage of design. The analysis shall include specific criteria furnished, conference minutes, and cost analyses of all systems considered.

(1) Clearly describe the electrical distribution system and state the changes to be made to the existing system to accommodate this project.

(2) State the electrical characteristics of power supply from the service point to the main service equipment (voltage, phase, number, and size of conductors).

(3) Indicate the type, number, voltage rating, and connections, and kV A rating of all transformers provided whether Contractor provided or Government furnished (existing).

(4) State the type of conductor and location of proposed use and provide a justification for its use.

(5) Include a statement describing the criteria used for the exterior design such as primary and secondary voltage drop. Describe the physical characteristics of circuits. Provide the short circuit current available at the site and state the source of this value.

(6) Describe all exterior lighting. Provide types of fixture, pole heights, and proposed intensities. IES point to point calculations shall be submitted to support the selected lighting system.

(7) Provide marked-up specifications supporting work in this category.

b. Drawings. In drawings, provide the following to allow verification that the design complies with the requirements of the project. Complete and independent checking of the design shall be accomplished by the Contractor. The Contractor is fully responsible for the design. The design shall be complete and accurate. It shall be thoroughly checked for

errors and conflicts (both within and between disciplines). The electronic systems drawing information may be placed on the electrical drawings or on separate electronic systems drawings.

(1) All of the exterior electrical design drawings shall be completed with all conductors (underground) with all pertinent component details. Details shall include but are not limited to duct banks, transformer location, transformer data (kV A, impedance. voltage, phase. etc.), conductor type and size, etc.

(2) Show removals and relocations, if any.

6.6.16 Electronic Systems

6.6.16.1 Interior Electronic Systems:

a. Narrative. The narrative shall show all information given in the concept narrative but in greater detail. In narrative, address the following to allow verification that the design complies with the requirements of the project. The design analysis shall include all calculations required to support design decisions and estimates at this stage of design. The analysis shall include specific criteria furnished, conference minutes, and cost analyses of all systems considered, along with list of contacts. Verify compliance with communicating section of UFC 4-510-01. Update TSRM to match submitted communications floor plans.

(1) Provide a descriptive narrative for all the electronic systems that are required for the project.

Telecommunication/Data Systems
Fire Detection and Alarm/Mass Notification System
Cable TV Systems

(2) Provide marked-up specifications supporting work in this category.

b. Drawings. The drawings shall show all information given on the concept drawings but in greater detail. In drawings, provide the following to allow verification that the design complies with the requirements of the project. Complete and independent checking of the design shall be accomplished by the Contractor. The Contractor is fully responsible for the design. The design shall be complete and accurate. It shall be thoroughly checked for errors and conflicts (both within and between disciplines). The electronic systems drawing information may be placed on the electrical drawings or on separate electronic systems drawings.

(1) Arrangement for each communications room to include plan drawings and elevation drawings of each wall that has equipment mounted to it.

(2)Provide riser diagrams for all electronic systems. Riser shall show the location of the various components and interconnections with other systems.

(3) Show location of all devices and equipment for electronic system on floor plans. Show location of devices to be interconnected.

(4) Provide details of telephone outlets, telephone backboard arrangement, rack elevations and other pertinent items required by criteria.

(5)Develop single-line riser diagram(s) for all initiating, indicating, signaling and alarm supervisory circuits with field devices as indicated in the FAMNS plans. Indicate all central equipment and system arrangements required. Prepare an input-output matrix of the sequence of operations indicating all combinations of alarm and supervisory functions. Show interfaces and points of connection to other building systems, such as the utility control system or an elevator control panel, for panels and equipment requiring a separate power source. Indicate the location of all FAMNS control and annunciation panels and all connections for notification, monitoring and control. Indicate FAMNS initiating and indicating circuits and locations of connected devices, which shall be coordinated with the (zone) layout of smoke compartments, and the connection to the Installation fire reporting system or transmitter.

(6)Update floor plans to indicate specific types and locations of control panels, batteries and chargers, transmitter(s), annunciator(s), fusible safety switch(es) or relay(s), remote trouble device, alarm initiating devices and indicating appliances, and connections to appliances and fire extinguishing system switches and controls. Show mounting details for installation of the radio antenna and transmitter. Indicate connection points for panels and equipment requiring AC power. Provide a layout of the Emergency Control Room indicating location of all FAMNS and related fire protection equipment, power supplies, and annunciator(s).

6.6.16.2 Exterior Electronic Systems:

a. Narrative: In narrative, address the following to allow verification that the design complies with the requirements of the project. The design analysis shall include all calculations required to support design decisions and estimates at this stage of design. The analysis shall include specific criteria furnished, conference minutes, and cost analyses of all systems considered.

(1) Describe the extent of the exterior work.

(2) Provide the name of the licensed corrosion engineer or NACE specialist. Provide the following for cathodic protection systems:

(a) Clearly define areas of structures or components in soil or water to be protected.

(b) Type system recommended, comparison of systems, cost estimates showing all equipment alternatives.

(c) Calculations on all systems that are considered showing all information and descriptions.

(3) Provide marked-up specifications supporting work in this category.

b. Drawings: In drawings, provide the following to allow verification that the design complies with the requirements of the project. Complete and

independent checking of the design shall be accomplished by the Contractor. The Contractor is fully responsible for the design. The design shall be complete and accurate. It shall be thoroughly checked for errors and conflicts (both within and between disciplines). The electronic systems drawing information may be placed on the electrical drawings or on separate electronic systems drawings.

(1)Communications site utility plans for voice, data, security and TV systems indicating any and all communications ductwork, manholes, hand-holes, and cable routing required to tie the new facility into the existing installation-wide networks/systems. Indicate all existing communications cables on, or adjacent to the immediate project site. Identify all cable types and size for new site communications cables.

(2) Cathodic protection system should be complete. Drawing shall indicate all structures or components to be protected and all cathodic protection components in relation to the protected structure. This includes showing sacrificial and impressed current anodes, rectifiers, isolation (dielectric) bonding, and any other data needed to define the scope and area of the cathodic protection system.

6.6.17 Anti-terrorism/Force Protection

a. Provide narrative and supporting documentation discussing methods of referenced requirements into project.

b. Antiterrorism/Force Protection requirements shall be included in applicable discipline drawings, design analysis and calculations to a level of completion described for an interim submittal in the Mobile District Design Manual.

6.6.18 Sustainable Design

a. Update previous versions of energy conscious design component of the design analysis and verify compliance with UFC 3-400-01.
b. Using the LEED-2009 for Healthcare v 3.0 Rating System, the Contractor shall submit a sustainable design narrative that includes a "Summary Table" of points earned at this phase of the project. The narrative supporting the point shown in the "Summary Table" shall briefly describe the feature used to obtain the point and how the point is or shall be earned. For each point earned that requires calculations and documentation provide this information to the level of design at this phase. Provide references to drawings and specifications for location of applicable features.

6.6.19 Provide a draft copy of ENG Form 4288, Submittal register

6.6.20 Prepare equipment list.

LEED documentation?

6.7 100% UNREVIEWED SUBMITTAL

6.7.1 Paving, Grading, and Drainage

Provide drawings, final specifications, narrative, annotated comments, and supporting documentation revised to comply with comments resulting from the 65% submittal. Include copies of all required permit applications.

6.7.2 Water Supply and Sanitary Sewer

a. Provide drawings, final specifications, narrative, annotated comments, and supporting documentation revised to comply with comments resulting from 65% submittal. Include copies of all required permit applications. Key points in the 100% unreviewed submittal include:

(1) Drawings shall be completed and ready for implementation by construction forces.

(2) The submittal shall include all construction details and standard drawings.

(3) Sanitary sewer profile.

6.7.3 Environmental

The Contractor shall provide a final UFGS 01 57 20.00 10, Environmental Protection specification. Where environmental permits are required, the Contractor shall prepare technical documentation for the permit application and submit the permit application(s) including payment of all fees to the Contracting Officer's Representative. All payment checks should be made out to Florida Department of Environmental Protection. The Contracting Officer's Representative shall forward all permit applications and fees to the Air Force 96 CEG/CEVC for review. The Air Force will sign the applications and forward them to the appropriate regulatory authority.

6.7.5 Landscape Work

Provide drawings, final specifications, narrative, annotated comments, and supporting documentation revised to comply with comments resulting from 65% submittal.

6.7.4 Geotechnical Investigation and Design

Provide Geotechnical Report, final specifications, narrative, annotated comments, and supporting documentation revised to comply with comments resulting from 65% submittal.

6.7.5 Architectural Design

Provide drawings, final specifications, narrative, annotated comments, and supporting documentation revised to comply with comments resulting from 65% submittal.

6.7.6 SID

The Contractor shall submit five (5) complete sets of the approved and final SID package. Once the Contractor has submitted the SID and the Government has approved the submittal, all materials, finishes, colors, textures and pattern submitted and approved for this project are then considered as part of the contract and the Contractor shall furnish and install all approved SID

finishes and items. No deviations will be considered once the SID has been approved.

6.7.7 Structural

Provide drawings, narrative, design analysis with complete calculations and supporting documentation, final specifications, and annotated comments, as shown for a final submittal in the Mobile District Design Manual revised to comply with comments resulting from 65% submittal. Structural drawings shall be carefully checked to insure coordination with architectural, site, mechanical, and electrical drawings.

6.7.8 Fire Protection

Submit the complete 100% unreviewed final submittal revised to comply with comments resulting from 65% submittal. Provide certification in writing (in accordance with UFC 3-600-01 1-4.1) from Fire Protection Engineer, that plans and specifications are in compliance with UFC 3-600-01.

a. Provide a submittal update, with corrections included for the "Approaches and Concerns" section, of the FPLSDN. Also, provide the Letter of Certification, sealed by the Project's FPE DoR, certifying that the design complies with UFC 3-600-01 and all applicable criteria, standards and codes.

6.7.9 Plumbing

The final plumbing design review package shall be submitted by the Contractor for Government review to include the final design analysis, specifications, annotated comments, and drawings of the plumbing systems showing the completed designs revised to comply with comments resulting from 65% submittal.

6.7.10 Heating, Ventilating and Air Conditioning (HVAC)

The final HVAC design review package shall be submitted by the Contractor for Government review to include the final design analysis, specifications, annotated comments, and drawings of the HVAC systems showing the completed designs revised to comply with comments resulting from 65% submittal.

6.7.11 Electrical Systems

6.7.11.1 Interior Electrical Systems

The final design review package revised to incorporate 65% review comments shall be submitted by the Contractor for Government review to include the final design analysis, specifications, annotated comments, and drawings showing the completed designs.

a. The drawings shall be thoroughly checked for discrepancies, for compatibility between drawing and specifications, and for compatibility between disciplines.

b. Completed short circuit calculations and a coordination analysis with time current curves and arc flash data for the entire electrical system shall be provided. All equipment shall be identified by manufacturer's name and catalog number.

c. Complete voltage drop calculations shall be provided. The voltage drop calculations shall use the same single line diagram as the short circuit calculations and shall show drops at the same locations as short circuit currents are shown.

d. Lighting calculations (lumen method for interior and point-to-point for exterior) shall be provided for all rooms and spaces and all exterior locations requiring illumination.

e. All details shall be completed at this stage. Congested areas where there can be interferences with various systems shall be thoroughly detailed by expanded scale drawings.

6.7.11.2 Exterior Electrical Distribution System:

The final design review package revised to incorporate 65% review comments shall be submitted by the Contractor for Government review to include the final design analysis, final specifications, annotated comments, and drawings showing the completed designs.

6.7.11.3 Interior Electronic Systems:

The final design review package revised to incorporate 65% review comments shall be submitted by the Contractor for Government review to include the final design analysis, final specifications, annotated comments, and drawings showing the completed designs.

6.7.11.4 Exterior Electronic Systems:

The final design review package revised to incorporate 65% review comments shall be submitted by the Contractor for Government review to include the final design analysis, final specifications, annotated comments, and drawings showing the completed designs.

6.7.12 Antiterrorism/Force Protection:

a. Provide narrative and supporting documentation discussing methods of incorporating requirements of UFC 4-010-01 into project.

b. Antiterrorism/Force Protection requirements shall be included in applicable disciplines' drawings, design analysis, calculations, and specifications as shown for a final submittal in the Mobile District Design Manual revised to comply with comments resulting from 65% submittal.

6.7.16 Sustainable Design:

Provide updates sustainable design narratives, "Summary Table" of points and supporting calculations and documentation. Highlight any changes and describe the reason for the change. Provide references to drawings and specifications for location of applicable features.

6.7.17 Update previous (submitted) version of executive summary in accordance with UFC 4-510-1.

6.8 100% (CORRECTED) FINAL SUBMITTAL

Completed drawings, specifications, design analysis, and supporting documentation for all previous submissions and disciplines per the Mobile District Design Manual with all comments incorporated.

7. QUANTITY OF SUBMITTAL ITEMS

The documents which the Contractor shall submit to the Government for each submittal are listed and generally described below.

8. MAILING OF SUBMITTALS

All submittals to the Government during design shall be mailed using overnight mailing service. The addresses to where each copy shall be mailed are listed below. Each submittal shall have a transmittal letter accompanying it which indicates the date, design percentage, type of submittal, list of items submitted, transmittal number and point of contact with telephone number.

8.1 ADDRESSES FOR SUBMITTAL DISTRIBUTION

a. Attn: CESAM-EN-D, Steven McDavid
Mail: P.O. Box 2288
Mobile, AL 36628-0001

FedEx: 109 St. Joseph Street
Mobile, AL 36602
Phone: 251-690-2621 Fax: 251-694-4057
Email: Steven.D.McDavid@usace.army.mil

b. US Army Corps of Engineers – Mobile District
Attn: CESAM-PM-I(C) (Krista Fayard)
Mail: P.O. Box 2288
Mobile, AL 36628-0001

FedEx: 109 St. Joseph Street
Mobile, AL 36602
Phone: 251-690-2180 Fax: 251-694-4343
Email: Krisa.R.Fayard@usace.army.mil

c. FEDEX or UPS
US Army Corps of Engineers
Florida Area Engineer Office
CESAM-CD-FA, Attn: Dennis Newell
2709 Florida Keys Avenue, Bldg 26
MacDill AFB, Florida 33608

US Postal Address
US Army Corps of Engineers
Florida Area Engineer Office
CESAM-CD-FA, Attn: Dennis Newell
P.O. Box 6230
MacDill AFB, FL 33608
Phone (321) 494-0641

d. FEDEX or UPS
US Army Humphreys Engineering & Support Center
Kingman Bldg. 2593, 3C06-12
Medical Facilities Center of Expertise
Attn: Anthony Hairston, Project Director
(703) 428-9135
Anthony.Hairston@usace.army.mil
7701 Telegraph Rd.,
Alexandria, VA 22315-3813

e. VA Construction Facility Manager
Office of Acquisition, Logistics and Construction – Orlando RE Office
Attn: Cullen Mumley

FED-EX or UPS Street Address
8875 Hidden River Parkway, Suite 275
Tampa, FL 33637
(202) 372-5674
Cullen.Mumley@va.gov

f. VA Construction Offices, Washington DC
Department of Veterans Affairs
Attn: Derrick Beale

FED-EX or UPS Street Address
425 I Street, NW, Room 6E.110F
Washington DC, 20001
(202) 632-6634
Milton.Beale@va.gov

g. VA Medical Center
James A Haley Veterans' Hospital
Attn: Rita Mercier

FED-EX or UPS Street Address
8875 Hidden River Parkway, Suite 275
Tampa, FL 33637
(813) 972-7659
Rita.Mercier1@va.gov

8.2 SUBMITTAL DISTRIBUTION

The following table lists the number of copies of design submittal requirements for this project [sample only, adjust numbers as required]:

	# Items Charrette	# Items 35% Submittal	# Items 65% Submittal	# Items 100% Submittal	# Items Construction Submittal
a	9 Design Narratives 9 Concept Drawing Files CADD 9 PDF Concept Drawings 1 CD of Submittal	9 Annotated Review Comments 9 Drawing Files CADD 9 Drawing Files PDF Format (1/2 size) 9 Specification Files-SpecsIntact Files (.sec) 9 Design Analysis 9 Appendices in Individual PDF file format 1 Structural Interior Design Submittal 1 FF&E 9 CD of Submittal	9 Annotated Review Comments 9 Drawing Files CADD 9 Drawing Files PDF Format (1/2 size) 9 Specification Files-SpecsIntact Files (.sec) 9 Design Analysis 2 Permit Application 9 Appendices in Individual PDF file format 1 Structural Interior Design Submittal 1 FF&E 9 CD of Submittal	9 Annotated Review Comments 9 Drawing Files CADD 9 Drawing Files PDF Format (1/2 size) 9 Specification Files-SpecsIntact Files (.sec) 9 Design Analysis 2 Permit Documents 9 Appendices in Individual PDF file format 1 Structural Interior Design Submittal 1 FF&E 9 CD of Submittal	2 Drawing Files-CADD 2 Drawing Files-PDF Format (1/2 size) 1 Specification Files-SpecsIntact Files (.sec) 2 Design Analysis 2 Permit Documents 2 Appendices in Individual PDF file format 2 8x10 Renderings 2 CD of Submittal

b	1 Design Narratives 1 Concept Drawing Files CADD 1 PDF Concept Drawings 1 CD of Submittal	1 Annotated Review Comments 1 Drawing Files CADD 1 Drawing Files PDF Format (1/2 size) 1 Specification Files-SpecsIntact Files (.sec) 1 Design Analysis 1 Appendices in Individual PDF file format 0 Structural Interior Design Submittal 0 FF&E 9 CD of Submittal	1 Annotated Review Comments 1 Drawing Files CADD 1 Drawing Files PDF Format (1/2 size) 1 Specification Files-SpecsIntact Files (.sec) 1 Design Analysis 1 Permit Application 1 Appendices in Individual PDF file format 0 Structural Interior Design Submittal 0 FF&E 9 CD of Submittal	1 Annotated Review Comments 1 Drawing Files CADD 1 Drawing Files PDF Format (1/2 size) 1 Specification Files-SpecsIntact Files (.sec) 1 Design Analysis 1 Permit Documents 1 Appendices in Individual PDF file format 0 Structural Interior Design Submittal 0 FF&E 9 CD of Submittal	1 Drawing Files-CADD 1 Drawing Files-PDF Format (1/2 size) 1 Specification Files-SpecsIntact Files (.sec) 1 Design Analysis 1 Permit Documents 1 Appendices in Individual PDF file format 1 8x10 Renderings 2 CD of Submittal

c	2 Design Narratives 2 Concept Drawing Files CADD 2 PDF Concept Drawings 2 CD of Submittal	2 Annotated Review Comments 2 Drawing Files CADD 5 Drawing Files PDF Format (1/2 size) 5 Specification Files-SpecsIntact Files (.sec) 5 Design Analysis 5 Appendices in Individual PDF file format 1 Structural Interior Design Submittal 1 FF&E 2 CD of Submittal	2 Annotated Review Comments 2 Drawing Files CADD 5 Drawing Files PDF Format (1/2 size) 5 Specification Files-SpecsIntact Files (.sec) 5 Design Analysis 1 Permit Application 5 Appendices in Individual PDF file format 1 Structural Interior Design Submittal 1 FF&E 2 CD of Submittal	2 Annotated Review Comments 2 Drawing Files CADD 5 Drawing Files PDF Format (1/2 size) 5 Specification Files-SpecsIntact Files (.sec) 5 Design Analysis 1 Permit Documents 5 Appendices in Individual PDF file format 1 Structural Interior Design Submittal 1 FF&E 2 CD of Submittal	2 Drawing Files-CADD 7 Drawing Files-PDF Format (1/2 size) 7 Specification Files-SpecsIntact Files (.sec) 7 Design Analysis 1 Permit Documents 5 Appendices in Individual PDF file format 2 8x10 Renderings 2 CD of Submittal
d	2 Design Narratives 2 Concept Drawing Files CADD 2 PDF Concept Drawings 2 CD of Submittal	2 Annotated Review Comments 2 Drawing Files CADD 2 Drawing Files PDF Format (1/2 size) 2 Specification Files-SpecsIntact Files (.sec) 2 Design Analysis 2 Appendices in Individual PDF file format 1 Structural Interior Design Submittal 1 FF&E 2 CD of Submittal	2 Annotated Review Comments 2 Drawing Files CADD 2 Drawing Files PDF Format (1/2 size) 2 Specification Files-SpecsIntact Files (.sec) 2 Design Analysis 0 Permit Application 2 Appendices in Individual PDF file format 1 Structural Interior Design Submittal 1 FF&E	2 Annotated Review Comments 2 Drawing Files CADD 2 Drawing Files PDF Format (1/2 size) 2 Specification Files-SpecsIntact Files (.sec) 2 Design Analysis 0 Permit Documents 2 Appendices in Individual PDF file format 1 Structural Interior Design Submittal 1 FF&E 2 CD of Submittal	2 Drawing Files-CADD 2 Drawing Files-PDF Format (1/2 size) 2 Specification Files-SpecsIntact Files (.sec) 2 Design Analysis 0 Permit Documents 2 Appendices in Individual PDF file format 2 8x10 Renderings 2 CD of Submittal

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e	2 Design Narratives 2 Concept Drawing Files CADD 2 PDF Concept Drawings 2 CD of Submittal	2 Annotated Review Comments 2 Drawing Files CADD 2 Drawing Files PDF Format (1/2 size) 2 Specification Files-SpecsIntact Files (.sec) 2 Design Analysis 2 Appendices in Individual PDF file format 1 Structural Interior Design Submittal 1 FF&E 2 CD of Submittal	2 Annotated Review Comments 2 Drawing Files CADD 2 Drawing Files PDF Format (1/2 size) 2 Specification Files-SpecsIntact Files (.sec) 2 Design Analysis 0 Permit Application 2 Appendices in Individual PDF file format 1 Structural Interior Design Submittal 1 FF&E 2 CD of Submittal	2 Annotated Review Comments 2 Drawing Files CADD 2 Drawing Files PDF Format (1/2 size) 2 Specification Files-SpecsIntact Files (.sec) 2 Design Analysis 0 Permit Documents 2 Appendices in Individual PDF file format 1 Structural Interior Design Submittal 1 FF&E 2 CD of Submittal	2 Drawing Files-CADD 2 Drawing Files-PDF Format (1/2 size) 2 Specification Files-SpecsIntact Files (.sec) 2 Design Analysis 0 Permit Documents 2 Appendices in Individual PDF file format 2 8x10 Renderings 2 CD of Submittal
f	2 Design Narratives 2 Concept Drawing Files CADD 2 PDF Concept Drawings 2 CD of Submittal	2 Annotated Review Comments 2 Drawing Files CADD 2 Drawing Files PDF Format (1/2 size) 2 Specification Files-SpecsIntact Files (.sec) 2 Design Analysis 2 Appendices in Individual PDF file format 1 Structural Interior Design Submittal 1 FF&E	2 Annotated Review Comments 2 Drawing Files CADD 2 Drawing Files PDF Format (1/2 size) 2 Specification Files-SpecsIntact Files (.sec) 2 Design Analysis 0 Permit Application 2 Appendices in Individual PDF file format	2 Annotated Review Comments 2 Drawing Files CADD 2 Drawing Files PDF Format (1/2 size) 2 Specification Files-SpecsIntact Files (.sec) 2 Design Analysis 0 Permit Documents 2 Appendices in Individual PDF file format 1 Structural Interior Design	2 Drawing Files-CADD 2 Drawing Files-PDF Format (1/2 size) 2 Specification Files-SpecsIntact Files (.sec) 2 Design Analysis 0 Permit Documents 2 Appendices in Individual PDF file format 2 8x10 Renderings 2 CD of Submittal

		2 CD of Submittal	1 Structural Interior Design Submittal 1 FF&E 2 CD of Submittal	Submittal 1 FF&E 2 CD of Submittal	
g	2 Design Narratives 2 Concept Drawing Files CADD 2 PDF Concept Drawings 2 CD of Submittal	2 Annotated Review Comments 2 Drawing Files CADD 2 Drawing Files PDF Format (1/2 size) 2 Specification Files-SpecsIntact Files (.sec) 2 Design Analysis 2 Appendices in Individual PDF file format 1 Structural Interior Design Submittal 1 FF&E 2 CD of Submittal	2 Annotated Review Comments 2 Drawing Files CADD 2 Drawing Files PDF Format (1/2 size) 2 Specification Files-SpecsIntact Files (.sec) 2 Design Analysis 0 Permit Application 2 Appendices in Individual PDF file format 1 Structural Interior Design Submittal 1 FF&E 2 CD of Submittal	2 Annotated Review Comments 2 Drawing Files CADD 2 Drawing Files PDF Format (1/2 size) 2 Specification Files-SpecsIntact Files (.sec) 2 Design Analysis 0 Permit Documents 2 Appendices in Individual PDF file format 1 Structural Interior Design Submittal 1 FF&E 2 CD of Submittal	2 Drawing Files-CADD 2 Drawing Files-PDF Format (1/2 size) 2 Specification Files-SpecsIntact Files (.sec) 2 Design Analysis 0 Permit Documents 2 Appendices in Individual PDF file format 2 8x10 Renderings 2 CD of Submittal

9. SUBMITTAL REVIEWS

For each design review submittal, the Contractor will be furnished comments from personnel of the Mobile District and from other concerned agencies involved in the review process. The review will be for conformance with the technical requirements of the solicitation. The Government will take twenty-one (21) days to review and comment on each unreviewed design submittal including the 100% unreviewed submittal. The Government will take fourteen (14) days from receipt of final submittal for back check of comments. The last two weeks of the calendar year shall not be considered when scheduling review times or meeting times. If the Contractor disagrees technically with any comment or comments and does not intend to comply with the comment, the Contractor shall clearly outline, with ample justification, the reasons for noncompliance within five (5) days after receipt of these comments in order that the comment can be resolved. The disposition of all comments shall be furnished in writing within 5 working days after the review meeting. The Contractor is cautioned in that if the Contractor believes the action required by any comment exceeds the requirements of this contract, that the Contractor should take no action and notify the Contracting Officer's Representative (COR) in writing immediately.

Review comments will be written using Design Review and Checking System (DrChecks). DrChecks is an Internet based computer program. DrChecks is free of charge. Comments will be written in DrChecks. The Contractor shall annotate the comments using DrChecks and the Government will backcheck the comments. For more information on DrChecks, go to http://www.projnet.org/projnet/binKormHome/index.cfm.

Review conferences will be held for each design submittal at James A Haley Veterans' Hospital, Tampa, Florida. The Contractor shall bring the personnel that developed the design submittal to the review conference. These conferences will take place the week after the twenty-one (21) day review period. The Contractor shall be responsible for writing and distributing Minutes on each submittal review meeting within 7 calendar days of the meeting. Time for design submittal reviews and conferences will be included in the Contractor's schedule. Distribution shall be to the offices shown under paragraph 8, Mailing of Submittals.

If a design submittal is over one (1) day late in accordance with the latest design schedule and the Contractor has not given the COR a one (1) week written notice that the submittal will be late, the Government review period will be extended 7 days. The review conference will be held the week after the extended review period.

During the design review process, comments will be made on the design submittals that will change the drawings and specifications. The Government will make no additional payments to the Contractor for the incorporation of comments. Review comments are considered part of the design/build process.

If the COR requests a design change after the Design Complete Submittal drawings and specifications have been submitted, then this shall be considered a change and proper payment will be made by the COR.

If a design submittal is not of the quality level required for the stage of design submitted, the Government has the right to return the submittal to the Contractor so the design quality can be increased, and request a resubmittal. The review time will begin when the submittal received is of the quality level required for the stage of design submitted by the Government. Returned incomplete submittals will not be the basis of a claim by the Contractor for additional time or money.

10. PAYMENT DURING DESIGN

Payments, as authorized by the Authorized COR, will be made monthly for the amount and value of the work and services performed by the Contractor. This estimate will be verified by the Contracting Officer utilizing the CONTRACTOR-PREPARED NETWORK ANALYSIS SYSTEM submitted by the Contractor and independent analyses of progress. See Contract Clause entitled PAYMENTS UNDER FIXED-PRICE CONSTRUCTION CONTRACTS for additional information.

11. DESIGN ANALYSIS

11.1 Media and Format. The design analysis shall be presented on 8-1/2" x 11" paper except that larger sheets may be used when required for graphs or other special calculation forms. All sheets (including oversized sheets, and hand calculations) shall be submitted in Adobe PDF format. The original material may be computer generated, typewritten, hand lettered, handwritten, or a combination thereof, provided it is legible. Side margins shall be 1-inch minimum to permit side binding and head to head printing. Bottom margins shall be 1-1/4 inches, with page numbers centered 1-inch from the bottom.

11.2 Organization. The several parts and sheets of the design analysis shall be given a sequential binding number and bound under a cover indicating the name of the facility and project number, if applicable. The title page shall carry the designation of the submittal being made. The complete design analysis presented for final review with the final drawings and specifications shall carry the designation "FINAL DESIGN ANALYSIS" on the title page.

11.3 Design Calculations. Design calculations are a part of the design analysis. When they are voluminous, they shall be bound separately from the narrative part of the design analysis. The design calculations shall be presented in a clean and legible form incorporating a title page and index for each volume. A table of contents, which shall be an index of the indices, shall be furnished when there is more than one volume. The source of loading conditions, supplementary sketches, graphs, formulae, and references shall be identified. Assumptions and conclusions shall be explained. Calculation sheets shall carry the names or initials of the computer and the checker and the dates of calculations and checking. No portion of the calculations shall be computed and checked by the same person.

11.4 Automatic Data Processing Systems (ADPS): When ADPS are used to perform design calculations, the design analysis shall include descriptions of the computer programs used and copies of the ADPS input data and output summaries. When the computer output is large. It may be divided into volumes at logical division points. Each set of computer printouts shall be preceded by an index and by a description of the computation performed. If several sets of computations are submitted, they shall be accompanied by a general table of contents in addition to the individual indices. Preparation of the descriptions which must accompany each set of ADPS printouts shall include the following:

a. Explain the design method, including assumptions, theories, and formulae.

b. Include applicable diagrams, adequately identified.

c. State exactly the computation performed by the computer.

d. Provide all necessary explanations of the computer printout format, symbols, and abbreviations.

e. Use adequate and consistent notation.

f. Provide sufficient information to permit manual checks of the results.

12. DRAWINGS

12.1 General: All drawings shall be Computer-Aided Design and Drafting (CADD) in AutoCAD Version 2014 format. The Contractor shall prepare the drawings in such a manner that the Mobile District could construct the facility without any additional assistance from the Contractor. Drawings shall be complete. Unnecessary work such as duplicate views, notes and lettering, and repetition of details shall not be permitted. Standard details not applicable to the project shall not be shown. Details of standard products or items which are adequately covered by specifications shall not be included on the drawings. Drawings shall be detailed such that conformance with the RFP can be checked and to the extent that shop drawings can be checked. Shop drawings shall not be used as design drawings. The Contractor shall use standard Corps of Engineers title blocks and borders on all drawings at all submittal stages. Standard drawing sheet formats and title blocks, and file and drawing CADD file names will be furnished to the Contractor by the Government. The Contractor shall incorporate the drawing, file, and contract numbers on individual drawing sheets at the earliest submittal.

12.2 35%, 65%, 100%, and Final Submittals: Drawing submittals shall be half size 15" x 21" blue/black lines.

The building drawings shall consist of 1/8" scale minimum floor plans. Elevations shall be drawn to a 1/8" scale minimum. The scale of other visual information shall be as required. Building wall sections shall be drawn at a minimum of 1/4" scale. The site and exterior utility drawings shall use a minimum scale of 1"=30' unless otherwise indicated. Additionally, the overall site plan for this project shall be on one drawing sheet. Minimum text size on half size drawings is 1/8".

13. SPECIFICATIONS

The Contractor shall submit marked-up specifications at the 65% submittal, and final specifications at the 100% unreviewed and final submittals. The specifications shall be Unified Guide Specifications (UFGS). These specifications are available on the Internet at:

http://www.wbdg.org/ccb/

The specifications shall be detailed enough such that another product meeting the specification could be substituted and it would not adversely impact the project. All marked-out or redlined text shall be deleted and all inserted text shall be typed at the 100% unreviewed and final submittals.

14. SUBMITTAL REGISTER

The Contractor shall develop submittal requirements required during construction as part of the design phase of the contract. This shall be done by the Contractor's Designer of Record by producing a Contractor Submittal Register at each submittal during design. A submittal register shall be prepared for each section of the specifications for the submittal requirements of that section. The Contractor's Designer of Record shall be responsible for listing all required submittals necessary to insure the project requirements are complied with. The Register shall identify submittal items such as shop drawings, manufacturer's literature, certificates of compliance, material samples, guarantees, test results, etc. that the Contractor shall submit for review and/or approval action during the life of the construction contract. See specifications Section 00 13 30 SUBMITTAL PROCEDURES (DESIGN BUILD) for submittal and submittal register definitions and procedures.

15. DESIGNER OF RECORD

The Contractor shall identify and have on his staff a Designer of Record to develop submittal requirements during design and be responsible for each submittal identified in the Contractor Submittal Register. A Designer of Record may be responsible for more than one submittal. All areas of work shall be accounted for by a listed Designer of Record. Designer of Record shall approve all submittals they are responsible for prior to submittal to the Government.

16. RENDERING AND PRINTS

16.1 Submit professionally prepared, renderings for the facility showing main entry in a slightly elevated perspective view. Submit electronic copies of renderings in accordance with Submittal Distribution List.

17. FACILITY TURNOVER PLANNING MEETINGS

17.1 (Red Zone - RZ) will be in accordance with Corps of Engineers' Business Enterprise Process. Key personnel will meet to identify strategies to ensure project is carried to expeditious closure and turnover to Client. Start turnover process at Pre- Construction Conference meeting. Facility Turnover Meetings (RZs) will start approximately 75% - 80% completion prior to Beneficial Occupancy Date (BOD). The Contracting Officer's Representative will lead meetings and guide discussions based on an agenda provided by the Government. The facility Turnover effort shall include the following: a. Pre Construction Meeting - Contracting Officer's Technical Representative (COTR)

will provide the RZ Checklist and the Contractor, Client, and FMS Representatives will compare Contractor's schedule to RZ Checklist items. b. Facility Turnover Meetings 1. Fill in the RZ Checklist including Contractor, Client, and FMS Checklist Items and assign a person responsible for each item and a due date. The Contractor's Representative will facilitate the assignment of responsibilities, fill out the RZ Checklist, and discuss "Interim DO From 1354" requirements. 2. Review Contractor's updated schedule. The Contractor shall comply with Corps' Business Enterprise Process and develop a completion plan with all Contractor, Client, and FMS Checklist items within the scope of this contract. a. Confirm that all RZ Checklist items will be completed on time for the scheduled Facility Turnover. b. Confirm interim 1354 will be completed by final inspection. c. Confirm as-builts and other record drawings comply with Mobile District Drafting Standards and are accomplished as per specification and delivered as per USACE as-built standard (attached).

18. AS-BUILT DOCUMENTS

18.1 Provide as-built drawings and specifications in accordance with Section 01 78 23 CLOSEOUT SUBMITTALS. Provide Real Property Inventory of Equipment (RPIE) in the format shown in CLOSEOUT SUBMITTALS. Update LEED design phase documentation during construction as needed to reflect construction changes and advancing project completion status (example - Commissioning Plan updates during construction phase) and include updated LEED documentation in construction closeout submittal.

ATTACHMENT A

STRUCTURAL INTERIOR DESIGN (SID) REQUIREMENTS

1.0 GENERAL INFORMATION

Structural Interior Design includes all building related elements and components generally part of the building itself, such as wall finishes, ceilings finishes, floor coverings, marker/bulletin boards, blinds, signage and built in casework. Develop the SID in conjunction with the furniture footprint.

2.0 STRUCTURAL INTERIOR DESIGN (SID) REQUIREMENTS FOR THE INTERIM AND FINAL DESIGN SUBMITTALS

2.1. FORMAT AND SCHEDULE

Prepare and submit for approval an interior and exterior building finishes scheme for an interim design submittal. The DOR shall meet with and discuss the finish schemes with the appropriate Government officials prior to preparation of the schemes to be presented. Present original sets of the schemes to reviewers at an interim design conference.

At the conclusion of the interim phase, after resolutions to the comments have been agreed upon between DOR and Government reviewers, the Contractor may proceed to final design with the interior finishes scheme presented.

The SID information and samples are to be submitted in 8-1/2" x 11" format using three ring binders with pockets on the inside of the cover. When there are numerous pages with thick samples, use more than one binder. Large D-ring binders are preferred to O-ring binders. Use page protectors that are strong enough to keep pages from tearing out. Anchor large or heavy samples with mechanical fasteners, Velcro, or double-faced foam tape rather than rubber cement or glue. Fold out items must have a maximum spread of 25-1/2". Provide cover and spine inserts sheets identifying the document as "Structural Interior Design" package. Include the project title and location, project number, Contractor/NE name and phone number(s), submittal stage and date.

Design submittal requirements include, but are not limited to the following.

2.1.1. Narrative of the Structural Interior Design Objectives

The SID shall include a narrative that discusses the building related finishes. Include topics that relate to base standards, life safety, sustainable design issues, aesthetics, durability, and maintainability, discuss the development and features as they relate to the occupants requirements and the building design.

2.1.2. Interior Color Boards

Identify and key each item on the color boards to the contract documents to provide a clear indication of how and where each item will be used. Arrange finish samples to the maximum extent possible by room type in order to illustrate room color coordination. Label all samples on the color boards with the manufacturer's name, patterns and colors name and number. Key or code samples to match key code system used on contract drawings.

Material and finish samples shall indicate true pattern, color, and texture. Provide photographs or colored photocopies of materials or fabrics to show large overall patterns in conjunction with actual samples to show the actual

colors. Finish samples must be large enough to show a complete pattern or design where practical.

Color boards shall include but not be limited to original color samples of the following:

- All walls finishes and ceiling finishes, including corner guards, acrylic wainscoting and wall guards/chair rail finishes.
- All tile information, including tile grout color and tile patterns.
- All flooring finishes, including patterns.
- All door, doorframe finishes, and door hardware finishes.
- All signage, wall base, toilet partitions, locker finishes and operable/folding partitions and trim.
- All millwork materials and finishes (cabinets, counter tops, etc.)
- All window frame finishes and window treatments (sills, blinds, etc.)

Color board samples shall reflect all actual finish textures, patterns, and colors required as specified. Patterned samples shall be of sufficient size to adequately show pattern and its repeat if a repeat occurs.

2.1.3. Exterior Color Boards

Prepare exterior finishes color boards in similar format as the interior finishes color boards, for presentation to the reviewers during an interim design conference. Provide original color samples of all exterior finishes including but not limited to the following:

- All roof finishes
- All crick and cast stone samples
- All exterior insulation and finish samples
- All glass color samples
- All exterior metals finishes
- All window and door frame finishes
- All specialty item finishes, including trim

Identify each item on the exterior finishes color boards and key to the building elevations to provide a clear indication of how and where each item will be used.

2.2. STRUCTURAL INTERIOR DESIGN DOCUMENTS

2.2.1. General

Structural interior design related drawings must indicate the placement of extents of SID material, finishes and colors and must be sufficiently detailed to define all interior work. The following is a list of minimum requirements:

2.2.2. Finish Color Schedule

Provide finish color schedule(s) in the contract documents. Provide a finish code, material type, manufacturer, series, and color designations. Key the finish code to the color board samples and drawings.

2.2.3. Interior Finish Plans

Indicate wall and floor patterns and color placement, material transitions and extents of interior finishes.

2.2.4. Furniture Footprint Plans

Provide furniture footprint plans showing the outline of all freestanding and systems furniture for coordination of all other disciplines.

2.2.5. Interior Signage

Include interior signage plans or schedules showing location and quantities of all interior signage. Key each interior sign to a quantitative list indicating size, quantity of each type and signage text.

2.2.6. Interior Elevations, Sections, and Details

Indicate material, color and finish placement.

ATTACHMENT B

FURNITURE, FIXTURES, AND EQUIPMENT (FF&E) REQUIREMENTS

1.0 FF&E REQUIREMENTS FOR THE INTERIM AND FINAL DESIGN SUBMITTALS

Note requirements in Section 01 10 00 for equipment drawings to include Government-furnished and installed medical equipment and systems components. Ensure that locations for these items are identified on the plans, and ensure building utilities and structure are coordinated and designed to interface with these items. Installation of utilities and other construction coordination requirements for FF&E are detailed in the Project Room Contents Report in Appendix N, and are cross-referenced to the Joint Schedule Number (JSN).

1.1. FORMAT AND SCHEDULE

Prepare and submit for approval a comprehensive FF&E scheme for an interim design submittal. The Contractor's interior designer shall develop the design. FF&E is the selection, layout, specification, and documentation of furniture and furnishings, which include but is not limited to furniture, waiting room seating and occasional tables, beds, wall units, night stands, chests, bedspreads and bedding, carts, desks, task chairs and stools, conventional case goods for administrative offices, guest seating for offices and exam rooms, conference and classroom tables and seating, wardrobes, storage cabinets, storage shelving, bookcases, TV/VCR carts and media carts, lecterns, area rugs, conference centers (i.e., wall hanging units with tack boards and dry-erase boards), filing cabinets, decorative window treatments, draperies, cornice boards, valances, magazine racks, chart holders, artwork and wall art, accessories (including artificial plants and planters), lamps, drafting tables, library furniture, children's furniture, clocks and waste containers and other accessories, etc.

D-B Contractor shall provide contract documentation to facilitate pricing, procurement, and installation. The FF&E package is based on the furniture footprint developed in the Structural Interior Design (SID) portion of the interior design. Develop the FF&E package concurrently with the building design to ensure that there is coordination between the electrical outlets, switches, J-boxes, communication outlets and connections, and lighting as appropriate. In addition, coordinate layout with other building features such as architectural elements, thermostats, location of TV's, GFGI equipment (for example computers, printers, copiers, shredders, faxes), etc. Locate furniture in front of windows only if the top of the item falls below the window and unless otherwise noted, do not attach furniture including furniture systems to the building. The DOR shall coordinate with the Owner Representative and HFPA Interior designer to determine FF&E requirements for furniture and furnishings prior to preparation of the scheme to be presented. Determine FF&E items and quantities by, but not limited to: (1) the number of personnel to occupy the building, (2) job functions and related furniture/office equipment to support the job function, (3) room functions. Present original sets of the scheme to reviewers at an interim design conference upon completion of the interim architectural submittal or three months prior to the submittal of the final FF&E package (whichever comes first).

Design may proceed to final with the FF&E scheme presented at the conclusion of the interim phase, after resolutions to the comments have been agreed upon between DOR and Government reviewers, especially the HFPA Interior Designer.

Provide six copies of the electronic versions of all documents upon completion of the final architectural submittal or ten months prior to the contract completion date (whichever comes first), to ensure adequate time for furniture acquisition. Provide bound, electronic drawings in CAD. Provide all files needed to view complete drawings. Submit all text documents in Microsoft Word or Excel.

Submit four copies of the final and complete FF&E information and samples in 8-1/2" x 11" format using three-ring binders with pockets on the inside of the cover upon completion of the final architectural submittal or 10 months prior to the contract completion date (whichever comes first). Use more than one binder when there are numerous pages with thick samples. Large D-ring binders are preferred to O-ring binders. Use page protectors that are strong enough to keep pages from tearing out for upholstery and finish boards. Anchor large or heavy samples with mechanical fasteners, Velcro, or double-faced foam tape rather than rubber cement or glue. Fold out items must have a maximum spread of 25-1/2". Provide cover and spine inserts sheets identifying the document as "Furniture, Fixtures, and Equipment" package and includes the project title and location, project number, Contractor/A/E name and phone number(s), submittal stage and date.

Provide electronic copies of all documents upon completion of the final architectural submittal or ten months prior to the contract completion date (whichever comes first), to ensure adequate time for furniture acquisition. Provide six compact disks with all drawings files needed to view the complete drawings unbound and in the latest version AutoCAD. Provide six additional compact disks of all text documents in Microsoft Word or Excel.

Design submittal requirements include, but are not limited to the following.

1.1.1. Narrative of Interior Design Objectives: Provide a narrative description of the furniture, to include functional, safety and ergonomic considerations, durability, sustainability, aesthetics, and compatibility with the building design.

1.1.2. Furniture Order Form: Prepare one Furnishings Order Form for each item specified in the design. This form identifies all information required to order each individual item. In addition to the project name and location, project number, and submittal phase, the order form must include as a minimum:

(a) Furniture item illustration and JSN
(b) Furniture item name
(c) Job name, location, and date
(d) General Services Administration (GSA) FSC Group, part, and section
(e) GSA Contractor name (Include ordering and payment address, telephone
Furniture item illustration and JSN
(a)
(b) Furniture item name

number and fax number, e-mail or website)

(f) Manufacturer, Product name, and Product model number or National Stock Number (NSN)

(g) Finish name and number (code to finish samples)

(h) Fabric name and number, minimum Wyzenbeek Abrasion Test double rubs (code to fabric samples) and cleaning instructions

(i) Dimensions

(j) Item location by room number, quantity per room and room name (can be listed on separate matrix or on pages inserted after Furniture Order Form)

(k) Total quantity

(l) Special instructions for procurement ordering and/or installation (if applicable)

(m) Written Product Description: include a non-proprietary paragraph listing the salient features of the item to include but not limited to the following.

(1) Required features and characteristics

(2) Ergonomic requirements

(3) Functional requirements

(4) Testing requirements

(5) Furniture style

(6) Construction materials

(7) Minimum warranty

The following is an example for "m" features and characteristics, ergonomic requirements and functional requirements: Chair Description:

(1) Mid-Back Ergonomic Task Chair

(2) Pneumatic Gaslift; Five Star Base

(3) Mesh Back; Upholstered Seat

(4) Height and Width Adjustable Task Arms:

a. Arm Height: 6-inch - 11-inch (+-112 inches)

b. Arm Width: 2-inch - 4- inch adjustment

(5) Height Adjustable Lumbar Support

(6) Adjustable Seat Height: 16-inch – 21-inch (+- 1 inch)

(7) Sliding Seat Depth Adjustment: 15-inch - 18-inch (+-1 inches)

(8) Standard Hard Casters (for carpeted areas)

(9) Overall Measurements:

a. Overall width: 25 to 27 inches

b. Overall depth: 25 to 28 inches

(10) Must have a minimum of the following adjustments (In addition to the above):

a. 360 Degree Swivel

b. Knee-Tilt with Tilt Tension

c. Back angle

d. Forward Tilt

e. Forward Tilt and Upright Tilt Lock

For projects with systems furniture, also provide a written description of the following minimum requirements:

(1) Type furniture systems (panel, stacking panels, spine wall, desk based system, or a combination)

(2) Minimum noise reduction coefficient (NRC)

(3) Minimum sound transfer coefficient (STC)

(4) Minimum flame spread and smoke development

(5) UL testing for task lighting and electrical system

(6) Panel widths and heights and their locations (this may be done on the drawings) work surface types and sizes (this may be done on the drawings)

(7) Work surface edge type

(8) Varying panel/cover finish materials and locations (locations may be shown on the drawings)

(9) Storage requirements

(10) Keyboard requirements

(11) Lock and keying requirements

(12) Accessory components (examples: tack boards, marker boards, paper management)

(13) Electrical and communication raceway requirement; type, capacity and location (base, beltline, below and/or above beltline)

(14) Locations of communication cables (base, beltline, below and/or above beltline, top channel)

(15) Types of electrical outlets

(16) Types of communication jacks; provided and installed by others

(17) Locations of electrical outlets and communication jacks (this may be done on the drawings)

(18) Type of cable (examples: Cat. 5, Cat. 6, fiber optic; UTP or STP, etc.) system needs to support; provided and installed by others

1.1.3. Alternate Manufacturer List: Provide a table consisting of major furniture items that lists the manufacturers products specified on the Order Form and two alternate manufacturers. Major furniture items include, but are not limited to, case goods, furniture systems, seating, and tables. Organize matrix by item code and item name. Supply alternates that are available on GSA Schedule and meet the requirements of the Furniture Order Form. Provide manufacturer name address, telephone number, product series and product name for each alternate manufacturer.

1.1.4. FF&E Procurement List: Provide a table that lists all FF&E furniture, and building Contractor Furnished/Contractor Installed (CF/CI) items. Give each item a code and name and designate whether item will be procured as part of the FF&E furniture, or the building construction contract. Use the item code to key all FF&E documents including location plans, color boards, data sheets, cost estimate, etc.

1.1.5. Points of Contact (POCs): Provide a comprehensive list of POCs needed to implement the FF&E package. This would include but not be limited to appropriate project team members, using activity contacts, interior design representatives, construction contractors and installers involved in the project. In addition to name, address, phone, fax and e-mail, include each contact's job function.

1.1.6. Color Boards: Provide color boards for all finishes and fabrics for all FF&E items. Finishes to be included but not limited to paint, laminate, wood finish, fabric, etc.

1.1.7. Itemized Furniture Cost Estimate: Provide an itemized cost estimate of furnishings keyed to the plans and specifications of products included in the package. This cost estimate should be based on GSA price schedules. The cost estimate must include separate line items for general contingency,

installation, electrical hook-up for systems furniture or other furniture requiring hardwiring by a licensed electrician, freight charges and any other related costs. Installation and freight quotes from vendors should be used in lieu of a percentage allowance when available. Include a written statement that the pricing is based on GSA schedules. An estimate developed by a furniture dealership may be provided as support information for the estimate, but must be separate from the contractor provided estimate.

1.2. INTERIOR DESIGN DOCUMENTS

1.2.1. Overall Furniture and Area Plans: Provide floor plans showing locations and quantities of all freestanding, and workstation furniture proposed for each floor of the building. Key each room to a large scale Furniture Placement Plan showing the furniture configuration, of all furniture. Provide enlarged area plans with a key plan identifying the area in which the building is located. Key all the items on the drawings by furniture item code. Do not provide manufacturer specific information such as product names and numbers on drawings. Drawings shall be non-proprietary. This is typical for FF&E on all plans, including those mentioned below.

1.2.2. Workstation Plans: Show each typical workstation configuration in plan view, elevations or isometric view. Drawings shall illustrate panels and all major components for each typical workstation configuration. Identify workstations using the same numbering system as shown on the project drawings. Key components to a legend on each sheet, which identifies and describes the components along with dimensions. Provide the plan, elevations, and isometric of each typical workstation together on the same drawing sheet.

1.2.3. Panel Plans: Show panel locations and critical dimensions from finished face of walls, columns, panels including clearances and aisle widths. Key panel assemblies to a legend, which shall include width, height, configuration of frames, panel fabric and finishes (if there are different selections existing within a project); powered or non-powered panel and wall mount locations.

1.2.4. Desk Plans: Provide typical free standing desk configurations in plan view, elevation or isometric view and identify components to clearly represent each desk configuration.

1.2.5. Reflected Ceiling Plans: Provide typical plans showing ceiling finishes and heights, lighting fixtures, heating ventilation and air conditioning supply and return, and sprinkler head placement for coordination of furniture.

1.2.6. Electrical and Telecommunication Plans: Show power provisions including type and locations of feeder components, activated outlets and other electrical components Show locations and quantities of outlets for workstations. Clearly identify different outlets, i.e., electrical, LAN, and telecommunication receptacles indicating each type proposed. Show wiring configuration, (circuiting, switching, internal and external connections) and provide as applicable.

1.2.7. Artwork Placement Plans: Provide an Artwork Placement Plan to show location of artwork, assign an artwork item code to each piece of artwork. As an alternative, artwork can be located on the Furniture Plans. Provide a schedule that identifies each piece by room name and number. Provide installation instructions; include mounting height. Coordinate artwork theme and placement with HFPA Interior Designer.

1.2.8. Window Drapery Plans: Provide Interior Window Drapery Plans. Key each drapery treatment to a schedule showing color, pattern, material,

drapery size and type, draw direction, location and quantities.

1.3. FURNITURE SELECTION

1.3.1. Select furniture from the GSA Schedules. Specify furniture available open market when an item is not available on the GSA Schedules. Provide justification for items not available on the GSA Schedules.

1.3.2. To the greatest extent possible when specifying furniture work within a manufacturer's family of furniture for selections. Each alternate should also be specified from a manufacturer's family of furniture, example: first set of alternates would be specified from Knoll's family of furniture and the second from Herman Miller family of furniture. It may be necessary to select from other than a manufacturer's family of furniture if costs are not reasonable for particular items, some items are not available or appropriate for the facility or the items are not on GSA Schedule. If this occurs, consider specifying product from an open line that is accessible by numerous dealerships. Select office furniture including case goods, tables, storage, seating, etc. that is compatible in style, finish and color. Select furniture that complies with ANSI/BIFMA and from manufacturer's standard product line as shown in the most recent published price list and/or amendment and not custom product.

1.4. CONSTRUCTION

1.4.1. Provide knee space at workstations and tables that is not obstructed by panels/legs that interfere with knee space of seated person and specify modesty panels at walls to be of a height or be hinged to allow access to building wall electrical outlets and communication jacks. Provide desks, storage and tables with leveling devices to compensate for uneven floors.

1.4.2. Specify workstation frames and storage media to be of steel construction. Provide work surface tops constructed to prevent warpage. Provide user-friendly features such as radius edges. Do not use sharp edges and exposed connections and ensure the underside of desks, tables and work surfaces are completely and smoothly finished. Provide abutting work surfaces that mate closely and are of equal heights when used in side-by-side configurations in order to provide a continuous and level work surface.

1.4.3. Drawers shall stay securely closed when in the closed position and protect wires from damage during drawer operation. Include a safety catch to prevent accidental removal when fully open.

1.4.4. Unless otherwise noted, provide lockable desks and workstations, filing cabinets and storage. Key all locks within a one-person office the same; key all one-person offices within a building differently. If an office or open office area has more than one workstation, key all the workstations differently, but key all locks within an individual workstation the same. Use tempered glass glazing when glazing is required. Use light-emitting diode (LED)/solid-state lighting where task lighting is required in furniture.

1.5. FINISHES AND UPHOLSTERY

1.5.1. Specify neutral colors for case goods, furniture systems, storage and tables. Specify desk work surfaces and table tops that are not too light or too dark in color and have a pattern to help hide soiling. Accent colors are allowed in break and lounge areas. Keep placement of furniture systems panel fabric accent colors to a minimum. All finishes shall be cleanable with ordinary household cleaning solutions.

1.5.2. Use manufacturer's standard fabrics; including textile manufacturers

fabrics that have been graded into the furniture manufactures fabric grades and are available through their GSA Schedule. Customers Own Material (COM) can be used in headquarter buildings in command suites with executive furniture. Coordinate specific locations with HFPA Interior Designer.

1.5.3. Specify seating upholstery that meets Wyzenbeek Abrasion Test, 75,000 minimum rubs. Specify a soil retardant finish for woven fabrics if Crypton or vinyl upholstery is not provided for seating in dining areas. Use manufacturer's standard fabrics. This includes textile manufacturers fabrics that have been graded into the furniture manufactures fabric grades and are available through their GSA Schedule. Specify upholstery and finish colors and patterns that help hide soiling. Specify finishes that can be cleaned with ordinary household cleaning solutions. Upholstery cleaning instructions are to be included on the Furniture Order Form.

1.6. ACCESSORIES

1.6.1. Specify all accessories required for completely finished furniture installation. Provide filing cabinets and storage for office supplies. Provide tack surfaces at workstations with overhead storage.

1.6.2. Not Used.

1.6.3. Workstations are to be equipped with stable keyboard trays that have height adjustability, tilting capability, including negative tilt, have a mouse pad at same height as the keyboard tray that can accommodate both left and right handed users, and retractable under work surface. Effort to implement all aspects of sustainability to the greatest extent possible for all the selections made in the FF&E package. This includes but is not limited to the selection of products that consider material chemistry and safety of inputs (what chemicals are used in the construction of the selections?); recyclability (do the selections contain recycled content?); disassembly (can the selections be disassembled at the end of their useful life to recycle their materials?).

1.8.2. Make selections to the greatest extent possible of products that possess current McDonough Braungart Design Chemistry (MBDC) certification or other "third-party" certified Cradle to Cradle program, Forest Stewardship Council (FSC) certification, GREENGAURD certification or similar "thirdparty" certified products consisting of low-emitting materials.

1.9. FURNITURE SYSTEMS

1.9.1. General: Where appropriate, design furniture systems for open office areas. Coordinate style and color of furniture systems with other storage, seating, etc. in open office areas. Minimize the number of workstation typical and the parts and pieces required for the design to assist in future reconfiguration and inventorying.

1.9.2. Connector Systems: Specify a connector system that allows removal of a single panel or spine wall within a typical workstation configuration without requiring disassembly of the workstation or removal of adjacent panels. Specify connector system with tight connections and continuous visual seals. When Acoustical panels are used, provide connector system with continuous acoustical seals. Specify concealed clips, screws, and other construction elements, where possible.

1.9.3. Panels and Spine Walls: Specify panels and spine walls with hinged or removable covers that permit easy access to the raceway when required but are securely mounted and cannot be accidentally dislodged under normal

conditions. Panels shall be capable of structurally supporting more than one fully loaded component per panel per side. Raceways are to be an integral part of the panel and must be able to support lay-in cabling and have a large capacity for electrical and IT. Do not thread cables through the frame.

1.9.4. Electrical and Information Technology (IT): Design furniture with electrical systems that meets requirements of UL 1286 when powered panels are required and UL approved task lights that meet requirements of NFPA 70. Dependent on user requirements and Section 01 1000, Paragraph 3 requirements, it is recommended that workstation electrical and IT wiring entry come from the building walls to eliminate the use of power poles and access at the floor. Design electrical and IT systems that are easily accessed in the spine wall and panels without having to move return panels and components. Electrical and IT management will be easily accessible by removable wall covers, which can be removed while workstation components are still attached. Specify connector system that has continuation of electrical and IT wiring within workstations and workstation-to-workstation.

1.9.5. Pedestals: Specify pedestals that are interchangeable from left to right, and right to left, and retain pedestal locking system capability.

1.10. EXECUTIVE FURNITURE

1.10.1. Design for executive furniture in command areas, coordinate specific locations with HFPA Interior Designer. Use upgraded furniture, upholsteries and finishes in command suites. This includes but is not limited to wood case goods, seating and tables. Select executive furniture case goods from a single manufacturer and style line, to include workstations, credenzas, filing, and storage, etc.

1.10.2. Specify furniture with wood veneer finish with mitered solid wood edge of same wood type. If instructed by HFPA Interior Designer, provide work surface plastic laminate that closely matches adjacent wood veneer. Other executive office furniture such as seating, tables, executive conference room furniture, etc., shall be compatible in style, finish and color with executive furniture case goods.

1.11. SEATING

1.11.1. General: Specify appropriate chair casters and glides for the floor finish where the seating is located. Universal casters that are appropriate for both hard surface flooring and carpet are preferred. All seating shall support up to a minimum of 250 1bs.

1.11.2. Desk and Guest Seating: Select ergonomic desk chairs with casters, non-upholstered adjustable arms, waterfall front, swivel, tilt, variable back lock, adjustable back height or adjustable lumbar support, and pneumatic seat height adjustment. Desk and guest chair backs may be other than upholstered, such as mesh fabric, if it is ergonomically designed, forms to back and is comfortable. All desk chairs shall have an adjustable seat height range of 4 1/2", range to include 16-1/2-20". Select guest chairs that are compatible in style, finish, and color with the desk chairs.

1.11.3. Conference Room Seating: At tables, select ergonomic conference seating with casters, non-upholstered arms, waterfall front, swivel, tilt, pneumatic seat height adjustment, and padded, contoured seat and back, unless otherwise noted. Select arm height and/or design that allow seating to be moved up closely to the tabletop. Conference chair backs may be other than upholstered such as mesh fabric if it is ergonomically designed, forms to back and is comfortable. Perimeter conference chairs shall be compatible in style, finish, and color with conference seating at the tables.

1.11.4. Lounge, Waiting, and Reception Area Seating: Select seating with arms and cushioned, upholstered seat and back. In heavy use areas, arms shall be easily cleaned such as non-upholstered arms or upholstered arms with wood arm caps unless otherwise noted. Waiting room seating for healthcare facilities shall have solid wood frame and shall offer replaceable slipcovers for seats and backs, shall have wall saver leg design, shall have "clean out" space between seat and back, shall have moisture barrier on seat cushion (as a minimum - if not using vinyl upholstery on seat); shall offer antimicrobial finish on wood componentry that inhibits the growth of molds & mildews - reduced fungal growth, and spores from germs/microbes/bacteria; and shall be upholstered in high performance fabrics (vinyl's, Crypton, Nanotex).

1.11.5. Break Room Seating: Select stackable seating that is easily cleaned. Seating shall be appropriate for table and counter heights as applicable with non-upholstered arms if arms are required.

1.11.6. Lounge, Waiting, and Reception Furniture: Design for end tables with plastic laminate or solid surface insets that are compatible in style finish and color with the seating.

1.12. FILING AND STORAGE

Select storage and shelving units that meet customers functional load requirements for stored items. Specify counterweights for filing cabinets when required by the manufacturer for stability. File drawers shall allow only one drawer to be opened at a time. Provide heavy-duty storage and shelving if information is not available.

1.13. TRAINING TABLES

Do not use plastic laminate self-edge. Training tables shall be reconfigurable, moveable, and storable; lighter weight folding with dollies or castered, as necessary. Nesting tables with fold-down tops are recommended. Specify dollies if required.

1.14. FURNITURE WARRANTIES

Specify manufacturer's performance guarantees or warranties that include parts, labor, and transportation as follows:

Furniture System, unless otherwise noted - 10 year minimum Furniture System Task Lights - 2-year minimum, excluding bulbs Furniture System Fabric - 3-year minimum Desks - 10-year minimum Seating, unless otherwise noted - 10 year minimum Seating Mechanisms and Pneumatic Cylinders - 10 years Fabric - 3 years minimum Filing and Storage - 10-year minimum Tables, unless otherwise noted - 10 year minimum Table Mechanisms - 5 year Table Ganging Device - 1 year Items not listed above - 1 year minimum

ATTACHMENT C

TRACKING COMMENTS IN DR CHECKS

1.0 General

The Government and DB Contractor shall set up the project in Dr Checks. Throughout the design process, the parties shall enter, track, and back-check comments using the DrChecks system. Government reviewers enter design review comments into DrChecks. Designers of Record shall annotate comments timely and specifically to indicate exactly what action will be taken or why the action is not required. Comments considered critical by the conference participants shall be flagged as such.

2.0 DrChecks Review Comments

The Contractor and the Government shall monitor DrChecks to assure all comments are annotated and agreed to by the designers and reviewers prior to the next submittal. The DrChecks comments and responses shall be printed and included in the design analysis for record.

2.1. Conference participants (reviewers) will expect coordination between Design Analysis calculations and the submitted design. Reviewers will also focus on the design submittal's satisfaction of the contract requirements.

2.2. The Designers of Record shall answer each comment in DrChecks with a formal response prior to the next submittal, clearly indicating what action will be taken and what drawing/spec will change. Designers of Record are encouraged to directly contact reviewers to discuss and agree to the formal comment responses rather than relying only on DrChecks and review meetings to discuss comments. With the next design conference, reviewers will back-check answers to the comments against the submittal, in addition to reviewing additional design work.

2.3. Comments that, in the DB Contractor's opinion, require effort outside the scope of the contract shall be clearly indicated as such in DrChecks. The D/B Contractor shall not proceed with work outside the contract until a modification to the contract is properly executed, if one is necessary.

3.0 DrChecks Initial Account Set-Up

To initialize an office's use of DrChecks, choose a contact person within the office to call the DrChecks Help Desk at 800-425-HELP, M-F, 8AM-5PM, Central time. This POC will be given an office password to distribute to others in the office. Individuals can then go to the hyperlink at http://www.projnet.org and register as a first time user. Upon registration, each user will be given a personal password to the DrChecks system.

3.1. Once the office and individuals are registered, the USACE's project manager or lead reviewer will assign the individuals and/or offices to the specific project for review. At this point, persons assigned can make comments, annotate comments, and close comments, depending on their particular assignment.

4.0 DrChecks Reviewer Roles

The Contractor is the technical reviewer and the Government is the compliance reviewer of the D/B designers design documents. Each reviewer enters their own comments into the DrChecks system. To enter comments:

4.1. Log into DrChecks.

4.2. Click on the appropriate project.

4.3. Click on the appropriate review conference. An Add comment screen will appear.

4.4. Select or fill out the appropriate sections (particularly comment discipline and type of document for sorting) of the comment form and enter the comment in the space provided.

4.5. Click the Add Comment button. The comment will be added to the database and a fresh screen will appear for the next comment you have.

4.6. Once comments are all entered, exit DrChecks by choosing "My Account" and then Logout.

5.0 DrChecks Comment Evaluations

The role of the designers of record is to evaluate and respond to the comments entered by the Government reviewers and by the DB Contractor. To respond to comments:

5.1. Log into DrChecks.

5.2. Click on the appropriate project.

5.3. Under "Evaluate" click on the number under "Pending."

5.4. Locate the comments that require your evaluation (note: If you know the comment number you can use the Quick Pick window on your home page in DrChecks; enter the number and click on go.).

5.5. Select the appropriate evaluation (concur, non-concur, for information only, or check and resolve) and add the response.

5.6. Click on the Add button. The evaluation will be added to the database and a fresh screen will appear with the next comment.

5.7. Once evaluations are all entered, exit DrChecks by choosing "My Account" and then logout.

6.0 DrChecks Back-check

At the following design conference, participants will back-check comment annotations against newly presented documents to verify that the designers' responses are acceptable and completed. The Contractor and Government reviewers shall either enter additional back-check comments, as necessary or close those that are resolved because of the design conferences:

6.1. Log into DrChecks.

6.2. Click on the appropriate project.

6.3. Under "My Back-check" click on the number under "Pending."

6.4. If you agree with the designer's response select "Close Comment" and add a closing response if desired.

6.5. If you do not agree with the designer's response or the submittal does not reflect the response given, select "Issue Open," enter additional information.

6.6. Click on the Add button. The back-check will be added to the database and a fresh screen will appear with the next comment.

6.7. Once back-checks are all entered, exit DrChecks by choosing "My Account" and then logout. The design is completed and final when there are no pending comments to be evaluated and there are no pending or open comments under

back-check.

ATTACHMENT D SAMPLE FIRE PROTECTION AND LIFE SAFETY CODE REVIEW

(Not Used)

ATTACHMENT E LEED SUBMITTALS

See Section 01 33 29 LEED DOCUMENTATION

ATTACHMENT F

BUILDING INFORMATION MODELING

ATTACHMENT G DESIGN SUBMITTAL AND DIRECTORY AND SUBDIRECTORY FILE ARRANGEMENT

Organize electronic design submittal files in a subdirectory/file structure in accordance with the following table. The Contractor may suggest a slightly different structure, subject to the discretion of the government.

Design Submittal Directory and Subdirectory File Arrangement

Directory	Sub-Directory	Sub-Directory or Files	Files
Submittal/Package Name	Narratives	PDF file or files with updated design narrative for each applicable design discipline	
	Drawings	PDF (subdirectory)	Single PDF file with all applicable drawing sheets – bookmarked by sheet number and name
		BIM (subdirectory) See Attachment F.	BIM project folder (with files) per the USACE Workspace. Include an Excel drawing index file with each drawing sheet listed by sheet #, name and corresponding dgn file name (Final Design & Design Complete only)
	Design Analysis & Calculations	Individual PDF files containing design analysis and calculations for each discipline applicable to the submittal	
		PDF file with Fire Protection and Life Safety Code Review checklist	
	LEED	PDF file with updated LEED Checklist	
		PDF file or files with LEED Templates for each point with applicable documentation included in each file	
		LEED SUBMITTALS	
	Energy Analysis	PDF with actual building energy consumption analysis	

Directory	Sub-Directory	Sub-Directory or Files	Files

		PDF with actual building energy consumption analysis	
	Specifications	Single PDF file with table of contents and all applicable specification sections	
		Submittal Register (Final Design & Design Complete only)	
	Design Quality Control	PDF file or files with DQC checklist(s) and/or statements	
	Building Rendering(s)	PDF file of rendering for each building type included in contract (Final Design & Design Complete only)	

End of Section 01 10 12

SECTION 01 32 01.00 10

PROJECT SCHEDULE
02/15

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AACE INTERNATIONAL (AACE)

AACE 29R-03	(2011) Forensic Schedule Analysis
AACE 52R-06	(2006) Time Impact Analysis - As Applied in Construction

U.S. ARMY CORPS OF ENGINEERS (USACE)

ER 1-1-11	(1995) Administration -- Progress, Schedules, and Network Analysis Systems

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Project Scheduler Qualifications; G
Preliminary Project Schedule; G
Initial Project Schedule; G
Periodic Schedule Update; G

1.3 PROJECT SCHEDULER QUALIFICATIONS

Designate an authorized representative to be responsible for the preparation of the schedule and all required updating and production of reports. The authorized representative must have a minimum of 5-years experience scheduling construction projects similar in size and nature to this project with scheduling software that meets the requirements of this specification. Representative must have a comprehensive knowledge of CPM scheduling principles and application.

PART 2 PRODUCTS

2.1 SOFTWARE

The scheduling software utilized to produce and update the schedules

required herein must be capable of meeting all requirements of this specification.

2.1.1 Government Default Software

The Government intends to use Primavera P6.

2.1.2 Contractor Software

Scheduling software used by the contractor must be commercially available from the software vendor for purchase with vendor software support agreements available. The software routine used to create the required sdef file must be created and supported by the software manufacturer.

2.1.2.1 Primavera

If Primavera P6 is selected for use, provide the "xer" export file in a version of P6 importable by the Government system.

2.1.2.2 Other Than Primavera

If the contractor chooses software other than Primavera P6, that is compliant with this specification, provide for the Government's use two licenses, two computers, and training for two Government employees in the use of the software. These computers will be stand-alone and not connected to Government network. Computers and licenses will be returned at project completion.

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

Prepare for approval a Project Schedule, as specified herein, pursuant to FAR Clause 52.236-15, SCHEDULE FOR CONSTRUCTION CONTRACTS. Show in the schedule the proposed sequence to perform the work and dates contemplated for starting and completing all schedule activities. The scheduling of the entire project is required. The scheduling of design and construction is the responsibility of the Contractor. Contractor management personnel must actively participate in its development. Designers, Subcontractors and suppliers working on the project must also contribute in developing and maintaining an accurate Project Schedule. Provide a schedule that is a forward planning as well as a project monitoring tool. Use the Critical Path Method (CPM) of network calculation to generate all Project Schedules. Prepare each Project Schedule using the Precedence Diagram Method (PDM).

3.2 BASIS FOR PAYMENT AND COST LOADING

The schedule is the basis for determining contract earnings during each update period and therefore the amount of each progress payment. The aggregate value of all activities coded to a contract CLIN must equal the value of the CLIN.

3.2.1 Activity Cost Loading

Activity cost loading must be reasonable and without front-end loading. Provide additional documentation to demonstrate reasonableness if requested by the Contracting Officer.

3.2.2 Withholdings / Payment Rejection

Failure to meet the requirements of this specification may result in the disapproval of the preliminary, initial or periodic schedule updates and subsequent rejection of payment requests until compliance is met.

In the event that the Contracting Officer directs schedule revisions and those revisions have not been included in subsequent Project Schedule revisions or updates, the Contracting Officer may withhold 10 percent of pay request amount from each payment period until such revisions to the project schedule have been made.

3.3 PROJECT SCHEDULE DETAILED REQUIREMENTS

3.3.1 Level of Detail Required

Develop the Project Schedule to the appropriate level of detail to address major milestones and to allow for satisfactory project planning and execution. Failure to develop the Project Schedule to an appropriate level of detail will result in its disapproval. The Contracting Officer will consider, but is not limited to, the following characteristics and requirements to determine appropriate level of detail:

3.3.2 Activity Durations

Reasonable activity durations are those that allow the progress of ongoing activities to be accurately determined between update periods. Less than 2 percent of all non-procurement activities may have Original Durations (OD) greater than 20 work days or 30 calendar days.

3.3.3 Design and Permit Activities

Include design and permit activities with the necessary conferences and follow-up actions and design package submission dates. Include the design schedule in the project schedule, showing the sequence of events involved in carrying out the project design tasks within the specific contract period. Provide at a detailed level of scheduling sufficient to identify all major design tasks, including those that control the flow of work. Also include review and correction periods associated with each item.

3.3.4 Procurement Activities

Include activities associated with the critical submittals and their approvals, procurement, fabrication, and delivery of long lead materials, equipment, fabricated assemblies, and supplies. Long lead procurement activities are those with an anticipated procurement sequence of over 90 calendar days.

3.3.5 Mandatory Tasks

Include the following activities/tasks in the initial project schedule and all updates.

a. Submission, review and acceptance of SD-01 Preconstruction Submittals (individual activity for each).

b. Submission, review and acceptance of design packages.

c. Submission of mechanical/electrical/information systems layout drawings.

d. Long procurement activities

e. Submission and approval of O & M manuals.

f. Submission and approval of as-built drawings.

g. Submission and approval of DD1354 data and installed equipment lists.

h. Submission and approval of testing and air balance (TAB).

i. Submission of TAB specialist design review report.

j. Submission and approval of fire protection specialist.

k. Submission and approval of Building Commissioning Plan, test data, and reports: Develop the schedule logic associated with testing and commissioning of mechanical systems to a level of detail consistent with the contract commissioning requirements. All tasks associated with all building testing and commissioning will be completed prior to submission of building commissioning report and subsequent contract completion.

l. Air and water balancing.

m. Building commissioning - Functional Performance Testing.

n. Controls testing plan submission.

o. Controls testing.

p. Performance Verification testing.

q. Other systems testing, if required.

r. Contractor's pre-final inspection.

s. Correction of punch list from Contractor's pre-final inspection.

t. Government's pre-final inspection.

u. Correction of punch list from Government's pre-final inspection.

v. Final inspection.

3.3.6 Government Activities

Show Government and other agency activities that could impact progress. These activities include, but are not limited to: acceptance, design reviews, environmental permit approvals by State regulators, inspections, utility tie-in, Government Furnished Equipment (GFE) and Notice to Proceed (NTP) for phasing requirements.

3.3.7 Standard Activity Coding Dictionary

Use the activity coding structure defined in the Standard Data Exchange Format (SDEF) in ER 1-1-11. This exact structure is mandatory. Develop and assign all Activity Codes to activities as detailed herein. A template

SDEF compatible schedule backup file is available on the QCS web site: http://rms.usace.army.mil.

The SDEF format is as follows:

Field	Activity Code	Length	Description
1	WRKP	3	Workers per day
2	RESP	4	Responsible party
3	AREA	4	Area of work
4	MODF	6	Modification Number
5	BIDI	6	Bid Item (CLIN)
6	PHAS	2	Phase of work
7	CATW	1	Category of work
8	FOW	20	Feature of work*
*Some systems require that FEATURE OF WORK values be placed in several activity code fields. The notation shown is for Primavera P6. Refer to the specific software guidelines with respect to the FEATURE OF WORK field requirements.			

3.3.7.1 Workers Per Day (WRKP)

Assign Workers per Day for all field construction or direct work activities, if directed by the Contracting Officer. Workers per day is based on the average number of workers expected each day to perform a task for the duration of that activity.

3.3.7.2 Responsible Party Coding (RESP)

Assign responsibility code for all activities to the Prime Contractor, Subcontractor(s) or Government agency(ies) responsible for performing the activity.

a. Activities coded with a Government Responsibility code include, but are not limited to: Government approvals, Government design reviews, environmental permit approvals by State regulators, Government Furnished Property/Equipment (GFP) and Notice to Proceed (NTP) for phasing requirements.

b. Activities cannot have more than one Responsibility Code. Examples of acceptable activity code values are: DOR (for the designer of record); ELEC (for the electrical subcontractor); MECH (for the mechanical subcontractor); and GOVT (for USACE).

3.3.7.3 Area of Work Coding (AREA)

Assign Work Area code to activities based upon the work area in which the

activity occurs. Define work areas based on resource constraints or space constraints that would preclude a resource, such as a particular trade or craft work crew from working in more than one work area at a time due to restraints on resources or space. Examples of Work Area Coding include different areas within a floor of a building, different floors within a building, and different buildings within a complex of buildings. Activities cannot have more than one Work Area Code.

Not all activities are required to be Work Area coded. A lack of Work Area coding indicates the activity is not resource or space constrained.

3.3.7.4 Modification Number (MODF)

Assign a Modification Number Code to any activity or sequence of activities added to the schedule as a result of a Contract Modification, when approved by Contracting Officer. Key all Code values to the Government's modification numbering system. An activity can have only one Modification Number Code.

3.3.7.5 Bid Item Coding (BIDI)

Assign a Bid Item Code to all activities using the Contract Line Item Schedule (CLIN) to which the activity belongs, even when an activity is not cost loaded. An activity can have only one BIDI Code.

3.3.7.6 Phase of Work Coding (PHAS)

Assign Phase of Work Code to all activities. Examples of phase of work are design phase, procurement phase, and construction phase. Each activity can have only one Phase of Work code.

a. Code proposed fast track design and construction phases proposed to allow filtering and organizing the schedule by fast track design and construction packages.

b. If the contract specifies phasing with separately defined performance periods, identify a Phase Code to allow filtering and organizing the schedule accordingly.

3.3.7.7 Category of Work Coding (CATW)

Assign a Category of Work Code to all activities. Category of Work Codes include, but are not limited to design, design submittal, design reviews, review conferences, permits, construction submittals, procurement, fabrication, weather sensitive installation, non-weather sensitive installation, start-up, and testing activities. Each activity can have no more than one Category of Work Code.

3.3.7.8 Feature of Work Coding (FOW)

Assign a Feature of Work Code to appropriate activities based on the Definable Feature of Work to which the activity belongs based on the approved QC plan.

Definable Feature of Work is defined in Section 01 45 00.00 10 QUALITY CONTROL. An activity can have only one Feature of Work Code.

3.3.8 Contract Milestones and Constraints

Milestone activities are to be used for significant project events including, but not limited to, project phasing, project start and end activities, or interim completion dates. The use of artificial float constraints such as "zero free float" or "zero total float" are prohibited.

Mandatory constraints that ignore or effect network logic are prohibited. No constrained dates are allowed in the schedule other than those specified herein. Submit additional constraints to the Contracting Officer for approval on a case by case basis.

3.3.8.1 Project Start Date Milestone and Constraint

The first activity in the project schedule must be a start milestone titled "NTP Acknowledged," which must have a "Start On" constraint date equal to the date that the NTP is acknowledged.

3.3.8.2 End Project Finish Milestone and Constraint

The last activity in the schedule must be a finish milestone titled "End Project."

Constrain the project schedule to the Contract Completion Date in such a way that if the schedule calculates an early finish, then the float calculation for "End Project" milestone reflects positive float on the longest path. If the project schedule calculates a late finish, then the "End Project" milestone float calculation reflects negative float on the longest path. The Government is under no obligation to accelerate Government activities to support a Contractor's early completion.

3.3.8.3 Interim Completion Dates and Constraints

Constrain contractually specified interim completion dates to show negative float when the calculated late finish date of the last activity in that phase is later than the specified interim completion date.

3.3.8.3.1 Start Phase

Use a start milestone as the first activity for a project phase. Call the start milestone "Start Phase X" where "X" refers to the phase of work.

3.3.8.3.2 End Phase

Use a finish milestone as the last activity for a project phase. Call the finish milestone "End Phase X" where "X" refers to the phase of work.

3.3.9 Calendars

Schedule activities on a Calendar to which the activity logically belongs. Develop calendars to accommodate any contract defined work period such as a 7-day calendar for Government Acceptance activities, concrete cure times, etc. Develop the default Calendar to match the physical work plan with non-work periods identified including weekends and holidays. Develop sSeasonal Calendar(s) and assign to seasonally affected activities as applicable.

If an activity is weather sensitive it should be assigned to a calendar showing non-work days on a monthly basis, with the non-work days selected

at random across the weeks of the calendar, using the anticipated days provided in the contract clause TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER. Assign non-work days over a seven-day week as weather records are compiled on seven-day weeks, which may cause some of the weather related non-work days to fall on weekends.

3.3.10 Open Ended Logic

Only two open ended activities are allowed: the first activity "NTP Acknowledged" may have no predecessor logic, and the last activity -"End Project" may have no successor logic.

Predecessor open ended logic may be allowed in a time impact analyses upon the Contracting Officer's approval.

3.3.11 Default Progress Data Disallowed

Actual Start and Finish dates must not automatically update with default mechanisms included in the scheduling software. Updating of the percent complete and the remaining duration of any activity must be independent functions. Disable program features that calculate one of these parameters from the other. Activity Actual Start (AS) and Actual Finish (AF) dates assigned during the updating process must match those dates provided in the Contractor Quality Control Reports. Failure to document the AS and AF dates in the Daily Quality Control report will result in disapproval of the Contractor's schedule.

3.3.12 Out-of-Sequence Progress

Activities that have progressed before all preceding logic has been satisfied (Out-of-Sequence Progress) will be allowed only on a case-by-case basis subject to approval by the Contracting Officer. Propose logic corrections to eliminate out of sequence progress or justify not changing the sequencing for approval prior to submitting an updated project schedule. Address out of sequence progress or logic changes in the Narrative Report and in the periodic schedule update meetings.

3.3.13 Added and Deleted Activities

Do not delete activities from the project schedule or add new activities to the schedule without approval from the Contracting Officer. Activity ID and description changes are considered new activities and cannot be changed without Contracting Officer approval.

3.3.14 Original Durations

Activity Original Durations (OD) must be reasonable to perform the work item. OD changes are prohibited unless justification is provided and approved by the Contracting Officer.

3.3.15 Leads, Lags, and Start to Finish Relationships

Lags must be reasonable as determined by the Government and not used in place of realistic original durations, must not be in place to artificially absorb float, or to replace proper schedule logic.

a. Leads (negative lags) are prohibited.

b. Start to Finish (SF) relationships are prohibited.

3.3.16 Retained Logic

Schedule calculations must retain the logic between predecessors and successors ("retained logic" mode) even when the successor activity(s) starts and the predecessor activity(s) has not finished (out-of-sequence progress). Software features that in effect sever the tie between predecessor and successor activities when the successor has started and the predecessor logic is not satisfied ("progress override") are not be allowed.

3.3.17 Percent Complete

Update the percent complete for each activity started, based on the realistic assessment of earned value. Activities which are complete but for remaining minor punch list work and which do not restrain the initiation of successor activities may be declared 100 percent complete to allow for proper schedule management.

3.3.18 Remaining Duration

Update the remaining duration for each activity based on the number of estimated work days it will take to complete the activity. Remaining duration may not mathematically correlate with percentage found under paragraph entitled Percent Complete.

3.3.19 Cost Loading of Closeout Activities

Cost load the "Correction of punch list from Government pre-final inspection" activity(ies) not less than 1 percent of the present contract value. Activity(ies) may be declared 100 percent complete upon the Government's verification of completion and correction of all punch list work identified during Government pre-final inspection(s).

3.3.19.1 As-Built Drawings

If there is no separate contract line item (CLIN) for as-built drawings, cost load the "Submission and approval of as-built drawings" activity not less than $35,000 or 1 percent of the present contract value, which ever is greater, up to $200,000. Activity will be declared 100 percent complete upon the Government's approval.

3.3.19.2 O & M Manuals

Cost load the "Submission and approval of O & M manuals" activity not less than $20,000. Activity will be declared 100 percent complete upon the Government's approval of all O & M manuals.

3.3.20 Anticipated Adverse Weather

Paragraph applicable to contracts with clause entitled TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER. Reflect the number of anticipated adverse weather delays allocated to a weather sensitive activity in the activity's calendar.

3.3.21 Early Completion Schedule and the Right to Finish Early

An Early Completion Schedule is an Initial Project Schedule (IPS) that indicates all scope of the required contract work will be completed before the contractually required completion date.

a. No IPS indicating an Early Completion will be accepted without being fully resource-loaded (including crew sizes and manhours) and the Government agreeing that the schedule is reasonable and achievable.

b. The Government is under no obligation to accelerate work items it is responsible for to ensure that the early completion is met nor is it responsible to modify incremental funding (if applicable) for the project to meet the contractor's accelerated work.

3.4 PROJECT SCHEDULE SUBMISSIONS

Provide the submissions as described below. The data CD/DVD, reports, and network diagrams required for each submission are contained in paragraph SUBMISSION REQUIREMENTS. If the Contractor fails or refuses to furnish the information and schedule updates as set forth herein, then the Contractor will be deemed not to have provided an estimate upon which a progress payment can be made.

Review comments made by the Government on the schedule(s) do not relieve the Contractor from compliance with requirements of the Contract Documents.

3.4.1 Preliminary Project Schedule Submission

Within 15 calendar days after the NTP is acknowledged submit the Preliminary Project Schedule defining the planned operations detailed for the first 90 calendar days for approval. The approved Preliminary Project Schedule will be used for payment purposes not to exceed 90 calendar days after NTP. Completely cost load the Preliminary Project Schedule to balance the contract award CLINS shown on the Price Schedule. The Preliminary Project Schedule may be summary in nature for the remaining performance period. It must be early start and late finish constrained and logically tied as specified. The Preliminary Project Schedule forms the basis for the Initial Project Schedule specified herein and must include all of the required plan and program preparations, submissions and approvals identified in the contract (for example, Quality Control Plan, Safety Plan, and Environmental Protection Plan) as well as design activities, planned submissions of all early design packages, permitting activities, design review conference activities, and other non-construction activities intended to occur within the first 90 calendar days. Government acceptance of the associated design package(s) and all other specified Program and Plan approvals must occur prior to any planned construction activities. Activity code any activities that are summary in nature after the first 90 calendar days with Bid Item (CLIN) code (BIDI), Responsibility Code (RESP) and Feature of Work code (FOW).

3.4.2 Initial Project Schedule Submission

Submit the Initial Project Schedule for approval within 42 calendar days after notice to proceed is issued. The schedule must demonstrate a reasonable and realistic sequence of activities which represent all work through the entire contract performance period. Include in the design-build schedule detailed design and permitting activities, including but not limited to identification of individual design packages, design submission, reviews and conferences; permit submissions and any required Government actions; and long lead item acquisition prior to design completion. Also cover in the preliminary design-build schedule the entire construction effort with as much detail as is known at the time but, as a minimum, include all construction start and completion milestones, and

detailed construction activities through the dry-in milestone,including all activity coding and cost loading. Include the remaining construction, including cost loading, but it may be scheduled summary in nature. As the design proceeds and design packages are developed, fully detail the remaining construction activities concurrent with the monthly schedule updating process. Constrain construction activities by Government acceptance of associated designs. When the design is complete, incorporate into the then approved schedule update all remaining detailed construction activities that are planned to occur after the dry-in milestone. If applicable, include in the design-build schedule detailed design and permitting activities, including but not limited to identification of individual design packages, design submission, reviews and conferences, permit submissions and any required Government actions, and long lead item acquisition prior to design completion. Also cover in the preliminary design-build schedule the entire construction effort with as much detail as is known at the time but, as a minimum, include all construction start and completion milestones, and detailed construction activities through the dry-in milestone, including all activity coding and cost loading. Include the remaining construction, including cost loading, but it may be scheduled summary in nature. As the design proceeds and design packages are developed, fully detail the remaining construction activities. No payment will be made for work items not fully detailed in the Project Schedule.

3.4.2.1 Design Package Schedule Submission

With each design package submitted to the Government, submit a fragnet schedule extracted from the then current Preliminary, Initial or Updated schedule which covers the activities associated with that Design Package including construction, procurement and permitting activities.

3.4.3 Periodic Schedule Updates

Update the Project Schedule on a regular basis, monthly at a minimum. Provide a draft Periodic Schedule Update for review at the schedule update meetings as prescribed in the paragraph PERIODIC SCHEDULE UPDATE MEETINGS. These updates will enable the Government to assess Contractor's progress. Update the schedule to include detailed construction activities as the design progresses, but not later than the submission of the final un-reviewed design submission for each separate design package. The Contracting Officer may require submission of detailed schedule activities for any distinct construction that is started prior to submission of a final design submission if such activity is authorized.

a. Update information including Actual Start Dates (AS), Actual Finish Dates (AF), Remaining Durations (RD), and Percent Complete is subject to the approval of the Government at the meeting.

b. AS and AF dates must match the date(s) reported on the Contractor's Quality Control Report for an activity start or finish.

3.5 SUBMISSION REQUIREMENTS

Submit the following items for the Preliminary Schedule, Initial Schedule, and every Periodic Schedule Update throughout the life of the project:

3.5.1 Data CD/DVDs

Provide two sets of data CD/DVDs containing the current project schedule and all previously submitted schedules in the format of the scheduling

software (e.g. .xer). Also include on the data CD/DVDs the Narrative Report and all required Schedule Reports. Label each CD/DVD indicating the type of schedule (Preliminary, Initial, Update), full contract number, Data Date and file name. Each schedule must have a unique file name and use project specific settings.

3.5.2 Narrative Report

Provide a Narrative Report with each schedule submission. The Narrative Report is expected to communicate to the Government the thorough analysis of the schedule output and the plans to compensate for any problems, either current or potential, which are revealed through that analysis. Include the following information as minimum in the Narrative Report:

a. Identify and discuss the work scheduled to start in the next update period.

b. A description of activities along the two most critical paths where the total float is less than or equal to 20 work days.

c. A description of current and anticipated problem areas or delaying factors and their impact and an explanation of corrective actions taken or required to be taken.

d. Identify and explain why activities based on their calculated late dates should have either started or finished during the update period but did not.

e. Identify and discuss all schedule changes by activity ID and activity name including what specifically was changed and why the change was needed. Include at a minimum new and deleted activities, logic changes, duration changes, calendar changes, lag changes, resource changes, and actual start and finish date changes.

f. Identify and discuss out-of-sequence work.

3.5.3 Schedule Reports

The format, filtering, organizing and sorting for each schedule report will be as directed by the Contracting Officer. Typically, reports contain Activity Numbers, Activity Description, Original Duration, Remaining Duration, Early Start Date, Early Finish Date, Late Start Date, Late Finish Date, Total Float, Actual Start Date, Actual Finish Date, and Percent Complete. Provide the reports electronically in .pdf format. Provide two set(s) of hardcopy reports. The following lists typical reports that will be requested:

3.5.3.1 Activity Report

List of all activities sorted according to activity number.

3.5.3.2 Logic Report

List of detailed predecessor and successor activities for every activity in ascending order by activity number.

3.5.3.3 Total Float Report

A list of all incomplete activities sorted in ascending order of total

float. List activities which have the same amount of total float in ascending order of Early Start Dates. Do not show completed activities on this report.

3.5.3.4 Earnings Report by CLIN

A compilation of the Total Earnings on the project from the NTP to the data date, which reflects the earnings of activities based on the agreements made in the schedule update meeting defined herein. Provided a complete schedule update has been furnished, this report serves as the basis of determining progress payments. Group activities by CLIN number and sort by activity number. Provide a total CLIN percent earned value, CLIN percent complete, and project percent complete. The printed report must contain the following for each activity: the Activity Number, Activity Description, Original Budgeted Amount, Earnings to Date, Earnings this period, Total Quantity, Quantity to Date, and Percent Complete (based on cost).

3.5.3.5 Schedule Log

Provide a Scheduling/Leveling Report generated from the current project schedule being submitted.

3.5.4 Network Diagram

The Network Diagram is required for the Preliminary, Initial and Periodic Updates. Depict and display the order and interdependence of activities and the sequence in which the work is to be accomplished. The Contracting Officer will use, but is not limited to, the following conditions to review compliance with this paragraph:

3.5.4.1 Continuous Flow

Show a continuous flow from left to right with no arrows from right to left. Show the activity number, description, duration, and estimated earned value on the diagram.

3.5.4.2 Project Milestone Dates

Show dates on the diagram for start of project, any contract required interim completion dates, and contract completion dates.

3.5.4.3 Critical Path

Show all activities on the critical path. The critical path is defined as the longest path.

3.5.4.4 Banding

Organize activities using the WBS or as otherwise directed to assist in the understanding of the activity sequence. Typically, this flow will group activities by major elements of work, category of work, work area and/or responsibility.

3.5.4.5 Cash Flow / Schedule Variance Control (SVC) Diagram

With each schedule submission, provide a SVC diagram showing 1) Cash Flow S-Curves indicating planned project cost based on projected early and late activity finish dates, and 2) Earned Value to-date.

3.6 PERIODIC SCHEDULE UPDATE

3.6.1 Periodic Schedule Update Meetings

Conduct periodic schedule update meetings for the purpose of reviewing the proposed Periodic Schedule Update, Narrative Report, Schedule Reports, and progress payment. Conduct meetings at least monthly within five days of the proposed schedule data date. Provide a computer with the scheduling software loaded and a projector which allows all meeting participants to view the proposed schedule during the meeting. The Contractor's authorized scheduler must organize, group, sort, filter, perform schedule revisions as needed and review functions as requested by the Contractor and/or Government. The meeting is a working interactive exchange which allows the Government and Contractor the opportunity to review the updated schedule on a real time and interactive basis. The meeting will last no longer than 8 hours. Provide a draft of the proposed narrative report and schedule data file to the Government a minimum of two workdays in advance of the meeting. The Contractor's Project Manager and scheduler must attend the meeting with the authorized representative of the Contracting Officer. Superintendents, foremen and major subcontractors must attend the meeting as required to discuss the project schedule and work. Following the periodic schedule update meeting, make corrections to the draft submission. Include only those changes approved by the Government in the submission and invoice for payment.

3.6.2 Update Submission Following Progress Meeting

Submit the complete Periodic Schedule Update of the Project Schedule containing all approved progress, revisions, and adjustments, pursuant to paragraph SUBMISSION REQUIREMENTS not later than 4 work days after the periodic schedule update meeting.

3.7 WEEKLY PROGRESS MEETINGS

Conduct a weekly meeting with the Government (or as otherwise mutually agreed to) between the meetings described in paragraph entitled PERIODIC SCHEDULE UPDATE MEETINGS for the purpose of jointly reviewing the actual progress of the project as compared to the as planned progress and to review planned activities for the upcoming two weeks. Use the current approved schedule update for the purposes of this meeting and for the production and review of reports. At the weekly progress meeting, address the status of RFIs, RFPs and Submittals.

3.8 REQUESTS FOR TIME EXTENSIONS

Provide a justification of delay to the Contracting Officer in accordance with the contract provisions and clauses for approval within 10 days of a delay occurring. Also prepare a time impact analysis for each Government request for proposal (RFP) to justify time extensions.

3.8.1 Justification of Delay

Provide a description of the event(s) that caused the delay and/or impact to the work. As part of the description, identify all schedule activities impacted. Show that the event that caused the delay/impact was the responsibility of the Government. Provide a time impact analysis that demonstrates the effects of the delay or impact on the project completion date or interim completion date(s). Evaluate multiple impacts chronologically; each with its own justification of delay. With multiple

impacts consider any concurrency of delay. A time extension and the schedule fragnet becomes part of the project schedule and all future schedule updates upon approval by the Contracting Officer.

3.8.2 Time Impact Analysis (Prospective Analysis)

Prepare a time impact analysis for approval by the Contracting Officer based on industry standard AACE 52R-06. Utilize a copy of the last approved schedule prior to the first day of the impact or delay for the time impact analysis. If Contracting Officer determines the time frame between the last approved schedule and the first day of impact is too great, prepare an interim updated schedule to perform the time impact analysis. Unless approved by the Contracting Officer, no other changes may be incorporated into the schedule being used to justify the time impact.

3.8.3 Forensic Schedule Analysis (Retrospective Analysis)

Prepare an analysis for approval by the Contracting Officer based on industry standard AACE 29R-03.

3.8.4 Fragmentary Network (Fragnet)

Prepare a proposed fragnet for time impact analysis consisting of a sequence of new activities that are proposed to be added to the project schedule to demonstrate the influence of the delay or impact to the project's contractual dates. Clearly show how the proposed fragnet is to be tied into the project schedule including all predecessors and successors to the fragnet activities. The proposed fragnet must be approved by the Contracting Officer prior to incorporation into the project schedule.

3.8.5 Time Extension

The Contracting Officer must approve the Justification of Delay including the time impact analysis before a time extension will be granted. No time extension will be granted unless the delay consumes all available Project Float and extends the projected finish date ("End Project" milestone) beyond the Contract Completion Date. The time extension will be in calendar days.

Actual delays that are found to be caused by the Contractor's own actions, which result in a calculated schedule delay will not be a cause for an extension to the performance period, completion date, or any interim milestone date.

3.8.6 Impact to Early Completion Schedule

No extended overhead will be paid for delay prior to the original Contract Completion Date for an Early Completion IPS unless the Contractor actually performed work in accordance with that Early Completion Schedule. The Contractor must show that an early completion was achievable had it not been for the impact.

3.9 FAILURE TO ACHIEVE PROGRESS

Should the progress fall behind the approved project schedule for reasons other than those that are excusable within the terms of the contract, the Contracting Officer may require provision of a written recovery plan for approval. The plan must detail how progress will be made-up to include which activities will be accelerated by adding additional crews, longer

work hours, extra work days, etc.

3.9.1 Artificially Improving Progress

Artificially improving progress by means such as, but not limited to, revising the schedule logic, modifying or adding constraints, shortening activity durations, or changing calendars in the project schedule is prohibited. Indicate assumptions made and the basis for any logic, constraint, duration and calendar changes used in the creation of the recovery plan. Any additional resources, manpower, or daily and weekly work hour changes proposed in the recovery plan must be evident at the work site and documented in the daily report along with the Schedule Narrative Report.

3.9.2 Failure to Perform

Failure to perform work and maintain progress in accordance with the supplemental recovery plan may result in an interim and final unsatisfactory performance rating and/or may result in corrective action directed by the Contracting Officer pursuant to FAR 52.236-15 Schedules for Construction Contracts, FAR 52.249-10 Default (Fixed-Price Construction), and other contract provisions.

3.9.3 Recovery Schedule

Should the Contracting Officer find it necessary, submit a recovery schedule pursuant to FAR 52.236-15 Schedules for Construction Contracts.

3.10 OWNERSHIP OF FLOAT

Except for the provision given in the paragraph IMPACT TO EARLY COMPLETION SCHEDULE, float available in the schedule, at any time, may not be considered for the exclusive use of either the Government or the Contractor including activity and/or project float. Activity float is the number of work days that an activity can be delayed without causing a delay to the "End Project" finish milestone. Project float (if applicable) is the number of work days between the projected early finish and the contract completion date milestone.

3.11 TRANSFER OF SCHEDULE DATA INTO RMS/QCS

Import the schedule data into the Quality Control System (QCS) and export the QCS data to the Government. This data is considered to be additional supporting data in a form and detail required by the Contracting Officer pursuant to FAR 52.232-5 - Payments under Fixed-Price Construction Contracts. The receipt of a proper payment request pursuant to FAR 52.232-27 - Prompt Payment for Construction Contracts is contingent upon the Government receiving both acceptable and approvable hard copies and matching electronic export from QCS of the application for progress payment.

3.12 PRIMAVERA P6 MANDATORY REQUIREMENTS

If Primavera P6 is being used, request a backup file template (.xer) from the Government, if one is available, prior to building the schedule. The following settings are mandatory and required in all schedule submissions to the Government:

a. Activity Codes must be Project Level, not Global or EPS level.

b. Calendars must be Project Level, not Global or Resource level.

c. Activity Duration Types must be set to "Fixed Duration & Units".

d. Percent Complete Types must be set to "Physical".

e. Time Period Admin Preferences must remain the default "8.0 hr/day, 40 hr/week, 172 hr/month, 2000 hr/year". Set Calendar Work Hours/Day to 8.0 Hour days.

f. Set Schedule Option for defining Critical Activities to "Longest Path".

g. Set Schedule Option for defining progressed activities to "Retained Logic".

h. Set up cost loading using a single lump sum labor resource. The Price/Unit must be $1/hr, Default Units/Time must be "8h/d", and settings "Auto Compute Actuals" and "Calculate costs from units" selected.

i. Activity ID's must not exceed 10 characters.

j. Activity Names must have the most defining and detailed description within the first 30 characters.

3.13 CONSTRUCTION SCHEDULE RISK ANALYSIS / MITIGATION PLAN

a. Schedule Risk Analysis - The contractor shall conduct the statistical schedule risk analysis based on the above detailed construction activities in the Day 1 approved diagram, identifying major schedule risk areas and recommended risk mitigation plans as outlined below.

b. The risk analysis shall be conducted by a person or firm skilled in the statistical method of schedule risk analysis based on the (PDM) network techniques for major construction projects, preferably in the major health care related projects. The cost of this service shall be included in the Contractor's proposal.

c. The Contracting Officer has the right to approve or disapprove the Person or firm designated to perform the risk analysis.

3.14 RISK ANALYSIS FORMAT / DATA REQUIREMENTS

a. Conduct Risk Analysis - Based on the approved software / format, the consultant shall perform statistical risk analysis on the detailed approved Day 1 diagram and the baseline schedule. The contractor shall review and utilize any previous Risk analysis performed by the A/E of record based on the "semi-detailed" (yet at an overall level) construction logic and schedule to ensure the continuity of previous schedule risk analysis. The contractor's project manager and Superintendent shall identify the major schedule risk areas and possible risk mitigation strategy/plan and record it in a narrative format, with electronic file submission to the VA as directed by the VA Contracting officer.

b. The submittal shall include three copies of a computer-produced risk analysis results, predicting the various meaningful probability curves of achieving the contract schedules. It shall also include a detailed narrative list of all major and minor potential and specific schedule and

cost risk areas and impact of them on the overall project, and a contractor's recommendations of mitigating the identified risks which must be addressed by the VA Project and Resident engineer teams to maintain the contract schedule.

c. The contractor shall, as a part of Risk monitoring, prepare a detailed Project Risk Register (PRR), identifying each risk items, risk assessment and its response plan. This PRR, at the discretion of VA SRE and CO, shall be discussed in a monthly risk management meeting for mitigation.

-- End of Section --

SECTION 01 33 00

SUBMITTAL PROCEDURES
05/11

PART 1 GENERAL

1.1 SUMMARY

The Contracting Officer may request submittals in addition to those specified when deemed necessary to adequately describe the work covered in the respective sections.

Units of weights and measures used on all submittals are to be the same as those used in the contract drawings.

Each submittal is to be complete and in sufficient detail to allow ready determination of compliance with contract requirements.

Contractor's and the Designer of Record, if applicable, to check and approve all items prior to submittal and stamp, sign, and date indicating action taken. Proposed deviations from the contract requirements are to be clearly identified. Include within submittals items such as: Contractor's, manufacturer's, or fabricator's drawings; descriptive literature including (but not limited to) catalog cuts, diagrams, operating charts or curves; test reports; test cylinders; samples; O&M manuals (including parts list); certifications; warranties; and other such required submittals.

Submittals requiring Government approval are to be scheduled and made prior to the acquisition of the material or equipment covered thereby. Pick up and dispose of samples not incorporated into the work in accordance with manufacturer's Material Safety Data Sheets (MSDS) and in compliance with existing laws and regulations.

A submittal register showing items of equipment and materials for when submittals are required by the specifications is provided as "Appendix A - Submittal Register".

1.2 DEFINITIONS

1.2.1 Submittal Descriptions (SD)

Submittals requirements are specified in the technical sections. Submittals are identified by Submittal Description (SD) numbers and titles as follows:

SD-01 Preconstruction Submittals

Submittals which are required prior to start of construction (work).or the start of the next major phase of the construction on a multi-phase contract, includes schedules, tabular list of data, or tabular list including location, features, or other pertinent information regarding products, materials, equipment, or components to be used in the work.

Certificates of insurance

Surety bonds

List of proposed Subcontractors

List of proposed products

Construction progress schedule

Network Analysis Schedule (NAS)

Submittal register

Schedule of prices or Earned Value Report

Health and safety plan

Work plan

Quality Control(QC) plan

Environmental protection plan

SD-02 Shop Drawings

Drawings, diagrams and schedules specifically prepared to illustrate some portion of the work.

Diagrams and instructions from a manufacturer or fabricator for use in producing the product and as aids to the Contractor for integrating the product or system into the project.

Drawings prepared by or for the Contractor to show how multiple systems and interdisciplinary work will be coordinated.

SD-05 Design Data

Design calculations, mix designs, analyses or other data pertaining to a part of work.

Design submittals, design substantiation submittals and extensions of design submittals.

SD-06 Test Reports

Report signed by authorized official of testing laboratory that a material, product or system identical to the material, product or system to be provided has been tested in accord with specified requirements. Unless specified in another section, testing must have been within three years of date of contract award for the project.

Report which includes findings of a test required to be performed by the Contractor on an actual portion of the work or prototype prepared for the project before shipment to job site.

Report which includes finding of a test made at the job site or on sample taken from the job site, on portion of work during or after installation.

Investigation reports.

Daily logs and checklists.

Final acceptance test and operational test procedure.

SD-07 Certificates

Statements printed on the manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that the product, system, or material meets specification requirements. Must be dated after award of project contract and clearly name the project.

Document required of Contractor, or of a manufacturer, supplier, installer or Subcontractor through Contractor. The document purpose is to further promote the orderly progression of a portion of the work by documenting procedures, acceptability of methods, or personnel qualifications.

Confined space entry permits.

Text of posted operating instructions.

SD-10 Operation and Maintenance Data

Data that is furnished by the manufacturer, or the system provider, to the equipment operating and maintenance personnel, including manufacturer's help and product line documentation necessary to maintain and install equipment. This data is needed by operating and maintenance personnel for the safe and efficient operation, maintenance and repair of the item.

This data is intended to be incorporated in an operations and maintenance manual or control system.

SD-11 Closeout Submittals

Documentation to record compliance with technical or administrative requirements or to establish an administrative mechanism.

Submittals required for Guiding Principle Validation (GPV) or Third Party Certification (TPC).

Special requirements necessary to properly close out a construction contract. For example, Record Drawings and as-built drawings. Also, submittal requirements necessary to properly close out a major phase of construction on a multi-phase contract.

1.2.2 Approving Authority

Office or designated person authorized to approve submittal.

1.2.3 Work

As used in this section, on- and off-site construction required by contract documents, including labor necessary to produce submittals, except those SD-01 Pre-Construction Submittals noted above, construction, materials, products, equipment, and systems incorporated or to be incorporated in such construction.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with this section.

SD-01 Preconstruction Submittals

Submittal Register; G

1.4 SUBMITTAL CLASSIFICATION

Submittals are classified as follows:

1.4.1 Designer of Record Approved (DA)

Designer of Record (DOR) approval is required for extensions of design, critical materials, any deviations from the solicitation, the accepted proposal, or the completed design, equipment whose compatibility with the entire system must be checked, and other items as designated by the Contracting Officer. Within the terms of the Contract Clause SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION, they are considered to be "shop drawings." Contractor to provide the Government with the number of copies designated hereinafter of all DOR approved submittals. The Government may review any or all Designer of Record approved submittals for conformance to the Solicitation, Accepted Proposal and the completed design. The Government will review all submittals designated as deviating from the Solicitation or Accepted Proposal, as described below. Design submittals to be in accordance with Section 01 10 12 DESIGN AFTER AWARD. Generally, design submittals should be identified as SD-05 Design Data submittals.

1.4.2 Government Approved (G)

Government approval is required for any deviations from the Solicitation or Accepted Proposal and other items as designated by the Contracting Officer. Within the terms of the Contract Clause SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION, they are considered to be "shop drawings."

1.4.3 Government Conformance Review of Design (CR)

The Government will review all intermediate and final design submittals for conformance with the technical requirements of the solicitation. Section 01 10 12 DESIGN AFTER AWARD covers the design submittal and review process in detail. Review will be only for conformance with the applicable codes, standards and contract requirements. Design data includes the design documents described in Section 01 10 12 DESIGN AFTER AWARD. Generally, design submittals should be identified as SD-05 Design Data submittals.

1.4.4 Designer of Record Approved/Government Conformance Review (DA/CR)

1.4.4.1 Deviations to the Accepted Design

Designer of Record approval and the Government's concurrence are required for any proposed deviation from the accepted design which still complies

with the contract before the Contractor is authorized to proceed with material acquisition or installation. Within the terms of the Contract Clause SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION, they are considered to be "shop drawings." If necessary to facilitate the project schedule, the Contractor and the DOR may discuss a submittal proposing a deviation with the Contracting Officer's Representative prior to officially submitting it to the Government. However, the Government reserves the right to review the submittal before providing an opinion, if deemed necessary. In any case, the Government will not formally agree to or provide a preliminary opinion on any deviation without the DOR's approval or recommended approval. The Government reserves the right to non-concur with any deviation from the design, which may impact furniture, furnishings, equipment selections or operations decisions that were made, based on the reviewed and concurred design.

1.4.4.2 Substitutions

Unless prohibited or provided for otherwise elsewhere in the Contract, where the accepted contract proposal named products, systems, materials or equipment by manufacturer, brand name and/or by model number or other specific identification, and the Contractor desires to substitute manufacturer or model after award, submit a requested substitution for Government concurrence. Include substantiation, identifying information and the DOR's approval, as meeting the contract requirements and that it is equal in function, performance, quality and salient features to that in the accepted contract proposal. If the Contract otherwise prohibits substitutions of equal named products, systems, materials or equipment by manufacturer, brand name and/or by model number or other specific identification, the request is considered a "variation" to the contract. Variations are discussed below in paragraphs: "Designer of Record Approved/Government Approved" and "VARIATIONS."

1.4.5 Designer of Record Approved/Government Approved (DA/GA)

In addition to the above stated requirements for proposed deviations to the accepted design, both Designer of Record and Government Approval and, where applicable, a contract modification are required before the Contractor is authorized to proceed with material acquisition or installation for any proposed variation to the contract (the solicitation and/or the accepted proposal), which constitutes a change to the contract terms. Within the terms of the Contract Clause SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION, they are considered to be "shop drawings." The Government reserves the right to accept or reject any such proposed deviation at its discretion.

1.4.6 For Information Only

For Design-build construction all submittals not requiring Designer of Record or Government approval will be for information only. They are not considered to be "shop drawings" within the terms of the Contract Clause referred to above.

1.4.7

Sustainability Reporting Submittals (S)

Submittals for Guiding Principle Validation (GPV) or Third Party Certification (TPC) are indicated with an "S" designation. Submit the information required by the technical sections that demonstrates compliance with the sustainable requirement, and for inclusion in the Sustainability

Notebook as required by Section 01 33 29 SUSTAINABILITY REPORTING. A full submittal for an item may be provided under another SD; however, for the "S" submittal, only provide that portion of the submittal that demonstrates compliance with the sustainable requirement. If the sustainable submittal does require Government Approval, it may be tagged under another SD with a "G."

Schedule submittals for these items throughout the course of construction as provided; do not wait until closeout.

1.5 PREPARATION

1.5.1 Transmittal Form

Use the attached sample transmittal form (ENG Form 4025) for submitting both Government approved and information only submittals in accordance with the instructions on the reverse side of the form. These forms are included in the QCS software that the Contractor is required to use for this contract. Properly complete this form by filling out all the heading blank spaces and identifying each item submitted. Exercise special care to ensure proper listing of the specification paragraph and sheet number of the contract drawings pertinent to the data submitted for each item.

1.5.2 Source Drawings for Shop Drawings

The entire set of Source Drawing files (DWG) will not be provided to the Contractor. Only those requested by the Contractor to prepare shop drawings may be provided. Request the specific Drawing Number only for the preparation of Shop Drawings. These drawings may only be provided after award.

1.5.2.1 Terms and Conditions

Data contained on these electronic files must not be used for any purpose other than as a convenience in the preparation of construction data for the referenced project. Any other use or reuse shall be at the sole risk of the Contractor and without liability or legal exposure to the Government. The Contractor must make no claim and waives to the fullest extent permitted by law, any claim or cause of action of any nature against the Government, its agents or sub consultants that may arise out of or in connection with the use of these electronic files. The Contractor must, to the fullest extent permitted by law, indemnify and hold the Government harmless against all damages, liabilities or costs, including reasonable attorney's fees and defense costs, arising out of or resulting from the use of these electronic files.

These electronic Source Drawing files are not construction documents. Differences may exist between the Source Drawing files and the corresponding construction documents. The Government makes no representation regarding the accuracy or completeness of the electronic Source Drawing files, nor does it make representation to the compatibility of these files with the Contractor hardware or software. In the event that a conflict arises between the signed and sealed construction documents prepared by the Government and the furnished Source Drawing files, the signed and sealed construction documents govern. The Contractor is responsible for determining if any conflict exists. Use of these Source Drawing files does not relieve the Contractor of duty to fully comply with the contract documents, including and without limitation, the need to check, confirm and coordinate the work of all contractors for the project.

If the Contractor uses, duplicates or modifies these electronic Source Drawing files for use in producing construction data related to this contract, remove all previous indicia of ownership (seals, logos, signatures, initials and dates).

1.5.3 Electronic File Format

Provide submittals in electronic format, with the exception of material samples required for SD-04 Samples items. In addition to the electronic submittal, provide three hard copies of the submittals. Compile the submittal file as a single, complete document, to include the Transmittal Form described within. Name the electronic submittal file specifically according to its contents, coordinate the file naming convention with the Contracting Officer. Electronic files must be of sufficient quality that all information is legible. Use PDF as the electronic format, unless otherwise specified or directed by the Contracting Officer. Generate PDF files from original documents with bookmarks so that the text included in the PDF file is both searchable and can be copied. If documents are scanned, Optical Character Resolution (OCR) routines are required. Index and bookmark files exceeding 30 pages to allow efficient navigation of the file. When required, the electronic file must include a valid electronic signature, or scan of a signature.

Email electronic submittal documents fewer than 10MB to an email address as directed by the Contracting Officer. Provide electronic documents over 10MB on an optical disc, or through an electronic file sharing system such as the AMRDEC SAFE Web Application located at the following website: https://safe.amrdec.army.mil/safe/.

Provide hard copies of submittals when requested by the Contracting Officer. Up to two additional hard copies of any submittal may be requested at the discretion of the Contracting Officer, at no additional cost to the Government.

1.6 QUANTITY OF SUBMITTALS

1.6.1 Number of Copies of SD-02 Shop Drawings

Submit six copies of submittals of shop drawings requiring review and approval only by QC organization and seven copies of shop drawings requiring review and approval by Contracting Officer.

1.6.2 Number of Copies of SD-03 Product Data and SD-08 Manufacturer's Instructions

Submit in compliance with quantity requirements specified for shop drawings.

1.6.3 Number of Samples SD-04 Samples

a. Submit two samples, or two sets of samples showing range of variation, of each required item. One approved sample or set of samples will be retained by approving authority and one will be returned to Contractor.

b. Submit one sample panel or provide one sample installation where directed. Include components listed in technical section or as directed.

c. Submit one sample installation, where directed.

d. Submit one sample of non-solid materials.

1.6.4 Number of Copies SD-05 Design Data and SD-07 Certificates

Submit in compliance with quantity requirements specified for shop drawings.

1.6.5 Number of Copies SD-06 Test Reports and SD-09 Manufacturer's Field Reports

Submit in compliance with quantity and quality requirements specified for shop drawings other than field test results that will be submitted with QC reports.

1.6.6 Number of Copies of SD-10 Operation and Maintenance Data

Submit five copies of O&M Data to the Contracting Officer for review and approval.

1.6.7 Number of Copies of SD-01 Preconstruction Submittals and SD-11 Closeout Submittals

Unless otherwise specified, submit two sets of administrative submittals.

1.7 INFORMATION ONLY SUBMITTALS

Normally submittals for information only will not be returned. Approval of the Contracting Officer is not required on information only submittals. The Government reserves the right to require the Contractor to resubmit any item found not to comply with the contract. This does not relieve the Contractor from the obligation to furnish material conforming to the plans and specifications; will not prevent the Contracting Officer from requiring removal and replacement of nonconforming material incorporated in the work; and does not relieve the Contractor of the requirement to furnish samples for testing by the Government laboratory or for check testing by the Government in those instances where the technical specifications so prescribe. For design-build construction the Government will retain two copies of information only submittals.

1.8 SUBMITTAL REGISTER

Prepare and maintain submittal register, as the work progresses. Do not change data which is output in columns (c), (d), (e), and (f) as delivered by Government; retain data which is output in columns (a), (g), (h), and (i) as approved. A submittal register showing items of equipment and materials for which submittals are required by the specifications is provided as an attachment. This list may not be all inclusive and additional submittals may be required. Maintain a submittal register for the project in accordance with Section 01 45 00.10 10 QUALITY CONTROL SYSTEM (QCS).

Column (c): Lists specification section in which submittal is required.

Column (d): Lists each submittal description (SD No. and type, e.g. SD-02 Shop Drawings) required in each specification section.

Column (e): Lists one principal paragraph in specification section where a material or product is specified. This listing is only to facilitate locating submitted requirements. Do not

consider entries in column (e) as limiting project requirements.

Thereafter, the Contractor is to track all submittals by maintaining a complete list, including completion of all data columns, including dates on which submittals are received and returned by the Government.

The Designer of Record develops a complete list of submittals during design and identify required submittals in the specifications, and use the list to prepare the Submittal Register. The list may not be all inclusive and additional submittals may be required by other parts of the contract. Complete the submittal register and submit it to the Contracting Officer for approval within 30 calendar days after Notice to Proceed. The approved submittal register will serve as a scheduling document for submittals and will be used to control submittal actions throughout the contract period. Coordinate the submit dates and need dates with dates in the Contractor prepared progress schedule. Submit monthly or until all submittals have been satisfactorily completed, updates to the submittal register showing the Contractor action codes and actual dates with Government action codes. Revise the submittal register when the progress schedule is revised and submit both for approval.

1.8.1 Use of Submittal Register

Submit submittal register. Submit with QC plan and project schedule. Verify that all submittals required for project are listed and add missing submittals. Coordinate and complete the following fields on the register submitted with the QC plan and the project schedule:

Column (a) Activity Number: Activity number from the project schedule.

Column (g) Contractor Submit Date: Scheduled date for approving authority to receive submittals.

Column (h) Contractor Approval Date: Date Contractor needs approval of submittal.

Column (i) Contractor Material: Date that Contractor needs material delivered to Contractor control.

1.8.2 Contractor Use of Submittal Register

Update the following fields with each submittal throughout contract.

Column (b) Transmittal Number: Contractor assigned list of consecutive numbers.

Column (j) Action Code (k): Date of action used to record Contractor's review when forwarding submittals to QC.

Column (l) List date of submittal transmission.

Column (q) List date approval received.

1.8.3 Approving Authority Use of Submittal Register

Update the following fields.

Column (b) Transmittal Number: Contractor assigned list of

consecutive numbers.

Column (l) List date of submittal receipt.

Column (m) through (p) List Date related to review actions.

Column (q) List date returned to Contractor.

1.8.4 Copies Delivered to the Government

Deliver one copy of submittal register updated by Contractor to Government with each invoice request.

1.9 VARIATIONS

Variations from contract requirements require both Designer of Record (DOR) and Government approval pursuant to contract Clause FAR 52.236-21 and will be considered where advantageous to Government.

1.9.1 Considering Variations

Discussion with Contracting Officer prior to submission, after consulting with the DOR, will help ensure functional and quality requirements are met and minimize rejections and re-submittals. When contemplating a variation which results in lower cost, consider submission of the variation as a Value Engineering Change Proposal (VECP).

Specifically point out variations from contract requirements in transmittal letters. Failure to point out deviations may result in the Government requiring rejection and removal of such work at no additional cost to the Government.

1.9.2 Proposing Variations

When proposing variation, deliver written request to the Contracting Officer, with documentation of the nature and features of the variation and why the variation is desirable and beneficial to Government, including the DOR's written analysis and approval. If lower cost is a benefit, also include an estimate of the cost savings. In addition to documentation required for variation, include the submittals required for the item. Clearly mark the proposed variation in all documentation.

Check the column "variation" of ENG Form 4025 for submittals which include proposed deviations requested by the Contractor. Set forth in writing the reason for any deviations and annotate such deviations on the submittal. The Government reserves the right to rescind inadvertent approval of submittals containing unnoted deviations.

1.9.3 Warranting that Variations are Compatible

When delivering a variation for approval, Contractor, including its Designer(s) of Record, warrants that this contract has been reviewed to establish that the variation, if incorporated, will be compatible with other elements of work.

1.9.4 Review Schedule Extension

In addition to normal submittal review period, a period of 10 working days will be allowed for consideration by the Government of submittals with

variations.

1.10 SCHEDULING

Schedule and submit concurrently submittals covering component items forming a system or items that are interrelated. Include certifications to be submitted with the pertinent drawings at the same time. No delay damages or time extensions will be allowed for time lost in late submittals. An additional 15 calendar days will be allowed and shown on the register for review and approval of submittals for food service equipment and refrigeration and HVAC control systems.

a. Coordinate scheduling, sequencing, preparing and processing of submittals with performance of work so that work will not be delayed by submittal processing. Allow for potential resubmittal of requirements.

b. Submittals called for by the contract documents will be listed on the register. If a submittal is called for but does not pertain to the contract work, the Contractor is to include the submittal in the register and annotate it "N/A" with a brief explanation. Approval by the Contracting Officer does not relieve the Contractor of supplying submittals required by the contract documents but which have been omitted from the register or marked "N/A."

c. Re-submit register and annotate monthly by the Contractor with actual submission and approval dates. When all items on the register have been fully approved, no further re-submittal is required.

d. Carefully control procurement operations to ensure that each individual submittal is made on or before the Contractor scheduled submittal date shown on the approved "Submittal Register."

1.10.1 Government Reviewed Design

The Government will review design submittals for conformance with the technical requirements of the solicitation. Section 01 10 12 DESIGN AFTER AWARD covers the design submittal and review process in detail. Government review is required for deviation from the completed design. Review will be only for conformance with the contract requirements. Included are only those construction submittals for which the Designer of Record design documents do not include enough detail to ascertain contract compliance. The Government may, but is not required, to review extensions of design such as structural steel or reinforcement shop drawings.

1.11 GOVERNMENT APPROVING AUTHORITY

When approving authority is Contracting Officer, the Government will:

a. Note date on which submittal was received.

b. Review submittals for approval within scheduling period specified and only for conformance with project design concepts and compliance with contract documents.

c. Identify returned submittals with one of the actions defined in paragraph REVIEW NOTATIONS and with markings appropriate for action indicated.

Upon completion of review of submittals requiring Government approval, stamp and date submittals. Four (4) copies of the submittal will be

retained by the Contracting Officer and two (2) copies of the submittal will be returned to the Contractor. If the Government performs a conformance review of other Designer of Record approved submittals, the submittals will be so identified and returned, as described above.

1.11.1 Review Notations

Contracting Officer review will be completed within 30 calendar days after date of submission. Submittals will be returned to the Contractor with the following notations:

a. Submittals marked "approved" or "accepted" authorize the Contractor to proceed with the work covered.

b. Submittals marked "approved as noted" or "approved, except as noted, resubmittal not required," authorize the Contractor to proceed with the work covered provided he takes no exception to the corrections.

c. Submittals marked "not approved" or "disapproved," or "revise and resubmit," indicate noncompliance with the contract requirements or design concept, or that submittal is incomplete. Resubmit with appropriate changes. No work shall proceed for this item until resubmittal is approved.

d. Submittals marked "not reviewed" will indicate submittal has been previously reviewed and approved, is not required, does not have evidence of being reviewed and approved by Contractor, or is not complete. A submittal marked "not reviewed" will be returned with an explanation of the reason it is not reviewed. Resubmit submittals returned for lack of review by Contractor or for being incomplete, with appropriate action, coordination, or change.

1.12 DISAPPROVED OR REJECTED SUBMITTALS

Make corrections required by the Contracting Officer. If the Contractor considers any correction or notation on the returned submittals to constitute a change to the contract drawings or specifications; notice as required under the FAR clause entitled CHANGES, is to be given to the Contracting Officer. Contractor is responsible for the dimensions and design of connection details and construction of work. Failure to point out deviations may result in the Government requiring rejection and removal of such work at the Contractor's expense.

If changes are necessary to submittals, make such revisions and submission of the submittals in accordance with the procedures above. No item of work requiring a submittal change is to be accomplished until the changed submittals are approved.

1.13 APPROVED/ACCEPTED SUBMITTALS

The Contracting Officer's approval or acceptance of submittals is not to be construed as a complete check, and indicates only that design, general method of construction, materials, detailing and other information appear to meet the Solicitation and Accepted Proposal.

Approval or acceptance will not relieve the Contractor of the responsibility for any error which may exist, as the Contractor under the Contractor Quality Control (CQC) requirements of this contract is responsible for design, dimensions, all design extensions, such as the

design of adequate connections and details, etc., and the satisfactory construction of all work.

After submittals have been approved or accepted by the Contracting Officer, no resubmittal for the purpose of substituting materials or equipment will be considered unless accompanied by an explanation of why a substitution is necessary.

1.14 APPROVED SAMPLES

Approval of a sample is only for the characteristics or use named in such approval and is not be construed to change or modify any contract requirements. Before submitting samples, the Contractor to assure that the materials or equipment will be available in quantities required in the project. No change or substitution will be permitted after a sample has been approved.

Match the approved samples for materials and equipment incorporated in the work. If requested, approved samples, including those which may be damaged in testing, will be returned to the Contractor, at his expense, upon completion of the contract. Samples not approved will also be returned to the Contractor at its expense, if so requested.

Failure of any materials to pass the specified tests will be sufficient cause for refusal to consider, under this contract, any further samples of the same brand or make of that material. Government reserves the right to disapprove any material or equipment which previously has proved unsatisfactory in service.

Samples of various materials or equipment delivered on the site or in place may be taken by the Contracting Officer for testing. Samples failing to meet contract requirements will automatically void previous approvals. Contractor to replace such materials or equipment to meet contract requirements.

Approval of the Contractor's samples by the Contracting Officer does not relieve the Contractor of his responsibilities under the contract.

1.15 WITHHOLDING OF PAYMENT

No payment for materials incorporated in the work will be made if all required Designer of Record or required Government approvals have not been obtained. No payment will be made for any materials incorporated into the work for any conformance review submittals or information only submittals found to contain errors or deviations from the Solicitation or Accepted Proposal.

1.16 STAMPS

Stamps used by the Contractor on the submittal data to certify that the submittal meets contract requirements is to be similar to the following:

CONTRACTOR
(Firm Name)
_____ Approved
_____ Approved with corrections as noted on submittal data and/or attached sheets(s)
SIGNATURE: _____
TITLE: _____
DATE: _____

For design-build construction, both the Contractor Quality Control System Manager and the Designer of Record are to stamp and sign to certify that the submittal meets contract requirements.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

SECTION 01 33 29

LEED(TM) DOCUMENTATION
02/10

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

1.2 [ENTER APPROPRIATE SUBPART TITLE HERE]

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are [for Contractor Quality Control approval.][for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government.] The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

LEED Implementation Plan[; G][; G, [_____]]

SD-11 Closeout Submittals

LEED Documentation Notebook[; G][; G, [_____]]

1.3 DESCRIPTION

The project criteria is defined within this RFP and shall be developed for a sustainable rating of silver equivalent in accordance with LEED Version [for Healthcare v 2009]Refer also to Section 01 10 10, Section 19 Sustainable Design for more specific criteria.. Table 1 (see paragraph Table) identifies the LEED credit items that are designed into or otherwise required for this project. No variations or substitutions to the LEED credits identified for this contract shall be allowed without written consent from the Contracting Officer. Should there be a case where there is any problem meeting the full requirements of a LEED credit identified for this project in Table 1, the Contractor must bring this to the attention of the Contracting Officer immediately.

1.3.1 Credit Validation

[This project will not be registered with USGBC for validation of credits earned. Validation of credits earned will be accomplished by the Government. Content of all construction documentation must be in accordance with the LEED Reference Guide requirements for supporting data required and must use LEED Letter Templates, which shall be obtained by Contractor at Contractor's expense. Design phase LEED documentation shall be provided by Contractor.]

1.3.2 Contractor Responsibilities

Some LEED credits are inherent in the design provided and require no further submittal or documentation. For these credits, the Contractor shall notify the Contracting Officer in advance of selection of any specified material or use of any permissible construction methods that may result in a deviation from the LEED requirement intent. Some LEED credits involve material selection and are generally identified within the technical sections with the notation "LEED," though not specifically identified in all occurrences. Some LEED credits are dependent on construction practices.

All LEED credits identified in Table 1 not inherent in the design provided shall be documented by the Contractor. Table 1 provides a general summary of applicable credits. Detailed submittal requirements are contained in the LEED Reference Guide and in the technical sections.

In all cases where a material, product, or execution requirement is identified by the Contractor "LEED" in the contract documents, additional data or certificates shall be submitted with the individual component or process validating the material or component to the respective LEED credit item. These additional data or certificates shall be separable from the other submitted data and a copy shall be included in the LEED Documentation Notebook in addition to the distribution indicated in the submittal register.

1.4 LEED IMPLEMENTATION PLAN

LEED Implementation Plan shall be submitted within ~~[30]~~[90] days after notice to proceed. The plan, when completed, shall provide a detailed description of all activities that relate to accomplishing project LEED requirements, including construction practices, procurement practices, and proposed submittals and documentation for each LEED credit. Plan shall also include the following:

a. Name of individual[s] on the Contractor's staff responsible for ensuring LEED credits and prerequisites are earned and responsible for assembling documentation. A responsible [~~individual~~] [LEED Accredited Professional] shall be identified.

b. Copy of [proposed] contract with Commissioning Agent.

c. Templates to be used for tracking LEED credits. Listing of documents to be provided for each credit and schedule for their inclusion in LEED Documentation Notebook.

d. List of all plans required in the technical sections for LEED credit. Proposed submittal date for each plan. These shall be added to the LEED Implementation Plan as they are completed.

e. Implementation plan for cumulative materials credits, which shall use applicable template with proposed materials, associated estimated costs, and details necessary for LEED Calculations added in order to determine if the listed materials can be expected to achieve the project goal. Submit cumulative materials implementation plans before materials purchasing begins.

1.5 LEED DOCUMENTATION NOTEBOOK

The Contractor shall prepare a comprehensive notebook documenting compliance for each LEED credit identified in Table 1. LEED Documentation Notebook shall be formatted to match LEED numbering system and tabbed for each credit and prerequisite. LEED documentation in notebook shall contain up to date information through the previous[week's][month's] work, and at least one set shall be available on the jobsite at all times. [The Notebook may be maintained and available for reference electronically if preferred.] Completed pages shall be prevented from being altered. If the Contractor fails to maintain the LEED Documentation Notebook as specified herein, the Contracting Officer will deduct from the monthly progress payment an amount representing the estimated cost of maintaining the Notebook. This monthly deduction will continue until an agreement can be reached between the Contracting Officer and the Contractor regarding the accuracy and completeness of the Notebook. The original, [one copy,] [[_____] copies,] and an electronic version on CD of the notebook shall be submitted at project closeout.

1.5.1 Content

Notebook shall include Table 1, applicable product data for material selection, final calculations, certifications for construction practices, procurement data, cumulative calculations and other items as identified in the approved LEED Implementation Plan. Notebook must contain all required data to support full compliance with the indicated LEED credit. LEED credits that are inherent to the design will be documented by the designer of record.

1.5.2 LEED Calculations

Calculations showing compliance with a required LEED credit identified in Table 1 or within the LEED Implementation Plan. Calculations shall be current and available for monthly review. Final calculations shall be included in the LEED Documentation Notebook under the appropriate tab.

1.5.3 Submittals

All "G" designated submittals required for inclusion in the LEED Documentation Notebook shall be separable from other submitted data and shall be included in the LEED Documentation Notebook in addition to the distribution indicated on the submittal register.

1.6 REQUIREMENTS

LEED credits as identified in Table 1 shall be incorporated and documented as required by the Contract documents and in full compliance with the LEED Reference Guide. LEED credits not identified elsewhere in the Contract documents and those requiring further instruction are specified below. Refer to the LEED Reference Guide for further definitions and requirements.

~~1.6.1 Materials and Resources Credit 3, Materials Reuse~~

~~Project goal is that a minimum of [5][10][_____] percent (by dollar value) of materials and products for the project are salvaged, refurbished, or reused materials and products. The following salvaged, refurbished, and reused materials are specified: [_____]. Contractor shall track cumulative calculations for this credit. [For this credit, performance is measured~~

~~[for the entire project] [separately for each facility or facility type indicated to achieve this credit in Table 1].]~~

~~1.6.2 Materials and Resources Credit 4, Recycled Content~~

~~[Not withstanding the requirements of Section 01 62 35 RECYCLED/RECOVERED MATERIALS, Contractor shall select materials so that the sum of post-consumer recycled content value plus one-half of post-industrial recycled content value constitutes at least [10][20][_____] percent of the total materials cost for the project. EPA Comprehensive Procurement Guidelines has a supplier database. California Integrated Waste Management Board (CIWMB) Recycled Content Directory also contains product and supplier data at www.ciwmb.ca.gov/rcp.]~~
~~[The following recycled content materials are specified so that the sum of post-consumer recycled content value plus one-half of post-industrial recycled content value constitutes at least [10][20][_____] percent of the total materials cost for the project: [_____].]~~

~~1.6.2.1 Calculations~~

~~LEED Letter Template forms[provided by Government] shall be used for tracking and documentation. Recycled content value of project materials shall be determined by the method described in the LEED Reference Guide.~~
~~[For this credit, performance is measured [for the entire project] [separately for each facility/facility type indicated to achieve this credit in Table 1].]~~

~~1.6.2.2 Substitutions~~

~~In the case of conflict between this requirement and individual technical section requirements, Contractor may submit for Government approval proposed alternative products or systems that provide equivalent performance and appearance and have greater contribution to project recycled content requirements. All such proposed substitutions shall be submitted with the LEED Implementation Plan accompanied by product data that demonstrates equivalence.~~

~~1.6.3 Materials and Resources Credit 5, Regional Materials~~

~~[Contractor shall select materials so that a minimum of [10][20][_____] percent (by dollar value) of materials and products for the project are extracted, harvested, or recovered, as well as manufactured, regionally within a 500 mile radius of the project site.]~~
~~[The following technical sections include regional material requirements so that, if available, a minimum of [10][20][_____] percent (by dollar value) of materials and products for the project are extracted, harvested, or recovered, as well as manufactured, regionally within a 500 mile radius of the project site: [_____].]~~

1.6.3.1 Calculations

LEED Letter Template forms[provided by the Government] shall be used for tracking and documentation. Amount of regional project materials shall be determined by the method described in the LEED Reference Guide. [For this credit, performance is measured[for the entire project][separately for each facility/facility type indicated to achieve this credit and Table 1].]

~~1.6.4 Materials and Resources Credit 6, Rapidly Renewable Materials~~

~~A minimum of [2.5][_____] percent (by dollar value) of materials and products for the project shall be rapidly renewable. Rapidly renewable materials are made from plants with a 10-year or shorter harvest cycle. The following rapidly renewable materials are specified: [_____]. Contractor shall track cumulative calculations for this credit. [For this credit, performance is measured [for the entire project] [separately for each facility/facility type indicated to achieve this credit in Table 1].]~~

~~1.6.5 Materials and Resources Credit 7, Certified Wood~~

~~[Contractor shall select materials so that a minimum of [50][_____] percent (by dollar value) of permanently installed wood-based materials and products for the project are certified in accordance with FSC STD 01 001.]~~
~~[The following certified wood materials are specified so that a minimum of [50][_____] percent (by dollar value) of wood-based materials and products for the project are certified in accordance with FSC STD 01 001: [_____].]~~

1.6.5.1 Calculations

LEED Letter Template forms[provided by the Government] shall be used for tracking and documentation. Amount of FSC-certified project materials shall be determined by the method described in the LEED Reference Guide. [For this credit, performance is measured [for the entire project] [separately for each facility/facility type indicated to achieve this credit in Table 1].]

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 COORDINATION MEETINGS

There will be three onsite coordination meetings. The first will be a preconstruction meeting to review the LEED Implementation Plan. The requirements for this meeting may be fulfilled during the coordination and mutual understanding meeting outlined in Section 01 45 00.00 10 QUALITY CONTROL. The second will be a pre-closeout meeting to review LEED Documentation Notebook for completeness and identify any outstanding issues relating to final score and documentation requirements. The third is a closeout meeting to review the final LEED Documentation Notebook. All meetings shall be attended by Contractor's designated individual responsible for LEED documentation, Government representative and Installation representative. At closeout meeting a final score for the project will be determined based on review of project performance and documentation. Contractor shall make a set of contract drawings and specifications available for review at each meeting as well as an updated LEED Documentation Notebook.

3.2 TABLE

LEED credits as identified in Table 1 below are contract requirements and shall be incorporated in full compliance with the LEED Reference Guide.

-- End of Section --

SECTION 01 35 26

GOVERNMENTAL SAFETY REQUIREMENTS
11/15

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN SOCIETY OF SAFETY ENGINEERS (ASSE/SAFE)

ASSE/SAFE A10.34	(2001; R 2012) Protection of the Public on or Adjacent to Construction Sites
ASSE/SAFE A10.44	(2014) Control of Energy Sources (Lockout/Tagout) for Construction and Demolition Operations
ASSE/SAFE Z244.1	(2003; R 2014) Control of Hazardous Energy Lockout/Tagout and Alternative Methods
ASSE/SAFE Z359.0	(2012) Definitions and Nomenclature Used for Fall Protection and Fall Arrest
ASSE/SAFE Z359.1	(2007) Safety Requirements for Personal Fall Arrest Systems, Subsystems and Components
ASSE/SAFE Z359.11	(2014) Safety Requirements for Full Body Harnesses
ASSE/SAFE Z359.12	(2009) Connecting Components for Personal Fall Arrest Systems
ASSE/SAFE Z359.13	(2013) Personal Energy Absorbers and Energy Absorbing Lanyards
ASSE/SAFE Z359.14	(2014) Safety Requirements for Self-Retracting Devices for Personal Fall Arrest and Rescue Systems
ASSE/SAFE Z359.15	(2014) Safety Requirements for Single Anchor Lifelines and Fall Arresters for Personal Fall Arrest Systems
ASSE/SAFE Z359.2	(2007) Minimum Requirements for a Comprehensive Managed Fall Protection Program
ASSE/SAFE Z359.3	(2007) Safety Requirements for Positioning and Travel Restraint Systems
ASSE/SAFE Z359.4	(2013) Safety Requirements for Assisted-Rescue and Self-Rescue Systems,

	Subsystems and Components
ASSE/SAFE Z359.6	(2009) Specifications and Design Requirements for Active Fall Protection Systems
ASSE/SAFE Z359.7	(2011) Qualification and Verification Testing of Fall Protection Products

ASME INTERNATIONAL (ASME)

ASME B30.20	(2013; INT Oct 2010 - May 2012) Below-the-Hook Lifting Devices
ASME B30.22	(2010) Articulating Boom Cranes
ASME B30.26	(2015; INT Jun 2010 - Jun 2014) Rigging Hardware
ASME B30.3	(2016) Tower Cranes
ASME B30.5	(2014) Mobile and Locomotive Cranes
ASME B30.8	(2015) Floating Cranes and Floating Derricks
ASME B30.9	(2014; INT Feb 2011 - Nov 2013) Slings

ASTM INTERNATIONAL (ASTM)

ASTM F855	(2015) Standard Specifications for Temporary Protective Grounds to Be Used on De-energized Electric Power Lines and Equipment

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE 1048	(2003) Guide for Protective Grounding of Power Lines
IEEE C2	(2012; Errata 1 2012; INT 1-4 2012; Errata 2 2013; INT 5-7 2013; INT 8-10 2014; INT 11 2015; INT 12 2016) National Electrical Safety Code

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 10	(2013) Standard for Portable Fire Extinguishers
NFPA 241	(2013; Errata 2015) Standard for Safeguarding Construction,Alteration, and Demolition Operations
NFPA 51B	(2014) Standard for Fire Prevention During Welding, Cutting, and Other Hot Work
NFPA 70	(2014; AMD 1 2013; Errata 1 2013; AMD 2 2013; Errata 2 2013; AMD 3 2014; Errata

	3-4 2014; AMD 4-6 2014) National Electrical Code
NFPA 70E	(2015; ERTA 1 2015) Standard for Electrical Safety in the Workplace

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2014) Safety and Health Requirements Manual

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

10 CFR 20	Standards for Protection Against Radiation
29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1910.146	Permit-required Confined Spaces
29 CFR 1910.147	Control of Hazardous Energy (Lock Out/Tag Out)
29 CFR 1910.333	Selection and Use of Work Practices
29 CFR 1915	Confined and Enclosed Spaces and Other Dangerous Atmospheres in Shipyard Employment
29 CFR 1915.89	Control of Hazardous Energy (Lockout/Tags-Plus)
29 CFR 1926	Safety and Health Regulations for Construction
29 CFR 1926.1400	Cranes and Derricks in Construction
29 CFR 1926.16	Rules of Construction
29 CFR 1926.450	Scaffolds
29 CFR 1926.500	Fall Protection
49 CFR 173	Shippers - General Requirements for Shipments and Packagings
CPL 2.100	(1995) Application of the Permit-Required Confined Spaces (PRCS) Standards, 29 CFR 1910.146

1.2 DEFINITIONS

1.2.1 Competent Person (CP)

The CP is a person designated in writing, who, through training, knowledge and experience, is capable of identifying, evaluating, and addressing existing and predictable hazards in the working environment or working conditions that are dangerous to personnel, and who has authorization to take prompt corrective measures with regards to such hazards.

1.2.2 Competent Person, Confined Space

The CP, Confined Space, is a person meeting the competent person requirements as defined EM 385-1-1 Appendix Q, with thorough knowledge of OSHA's Confined Space Standard, 29 CFR 1910.146, and designated in writing to be responsible for the immediate supervision, implementation and monitoring of the confined space program, who through training, knowledge and experience in confined space entry is capable of identifying, evaluating and addressing existing and potential confined space hazards and, who has the authority to take prompt corrective measures with regard to such hazards.

1.2.3 Competent Person, Cranes and Rigging

The CP, Cranes and Rigging, as defined in EM 385-1-1 Appendix Q, is a person meeting the competent person, who has been designated in writing to be responsible for the immediate supervision, implementation and monitoring of the Crane and Rigging Program, who through training, knowledge and experience in crane and rigging is capable of identifying, evaluating and addressing existing and potential hazards and, who has the authority to take prompt corrective measures with regard to such hazards.

1.2.4 Competent Person, Excavation/Trenching

A CP, Excavation/Trenching, is a person meeting the competent person requirements as defined in EM 385-1-1 Appendix Q and 29 CFR 1926, who has been designated in writing to be responsible for the immediate supervision, implementation and monitoring of the excavation/trenching program, who through training, knowledge and experience in excavation/trenching is capable of identifying, evaluating and addressing existing and potential hazards and, who has the authority to take prompt corrective measures with regard to such hazards.

1.2.5 Competent Person, Fall Protection

The CP, Fall Protection, is a person meeting the competent person requirements as defined in EM 385-1-1 Appendix Q and in accordance with ASSE/SAFE Z359.0, who has been designated in writing by the employer to be responsible for immediate supervising, implementing and monitoring of the fall protection program, who through training, knowledge and experience in fall protection and rescue systems and equipment, is capable of identifying, evaluating and addressing existing and potential fall hazards and, who has the authority to take prompt corrective measures with regard to such hazards.

1.2.6 Competent Person, Scaffolding

The CP, Scaffolding is a person meeting the competent person requirements in EM 385-1-1 Appendix Q, and designated in writing by the employer to be responsible for immediate supervising, implementing and monitoring of the scaffolding program. The CP for Scaffolding has enough training, knowledge and experience in scaffolding to correctly identify, evaluate and address existing and potential hazards and also has the authority to take prompt corrective measures with regard to these hazards. CP qualifications must be documented and include experience on the specific scaffolding systems/types being used, assessment of the base material that the scaffold will be erected upon, load calculations for materials and personnel, and erection and dismantling. The CP for scaffolding must have a documented, minimum of 8-hours of scaffold training to include training on the specific

type of scaffold being used (e.g. mast-climbing, adjustable, tubular frame), in accordance with EM 385-1-1 Section 22.B.02.

1.2.7 Competent Person (CP) Trainer

A competent person trainer as defined in EM 385-1-1 Appendix Q, who is qualified in the material presented, and who possesses a working knowledge of applicable technical regulations, standards, equipment and systems related to the subject matter on which they are training Competent Persons. A competent person trainer must be familiar with the typical hazards and the equipment used in the industry they are instructing. The training provided by the competent person trainer must be appropriate to that specific industry. The competent person trainer must evaluate the knowledge and skills of the competent persons as part of the training process.

1.2.8 High Risk Activities

High Risk Activities are activities that involve work at heights, crane and rigging, excavations and trenching, scaffolding, electrical work, and confined space entry.

1.2.9 High Visibility Accident

A High Visibility Accident is any mishap which may generate publicity or high visibility.

1.2.10 Load Handling Equipment (LHE)

LHE is a term used to describe cranes, hoists and all other hoisting equipment (hoisting equipment means equipment, including crane, derricks, hoists and power operated equipment used with rigging to raise, lower or horizontally move a load).

1.2.11 Medical Treatment

Medical Treatment is treatment administered by a physician or by registered professional personnel under the standing orders of a physician. Medical treatment does not include first aid treatment even through provided by a physician or registered personnel.

1.2.12 Near Miss

A Near Miss is a mishap resulting in no personal injury and zero property damage, but given a shift in time or position, damage or injury may have occurred (e.g., a worker falls off a scaffold and is not injured; a crane swings around to move the load and narrowly misses a parked vehicle).

1.2.13 Operating Envelope

The Operating Envelope is the area surrounding any crane or load handling equipment. Inside this "envelope" is the crane, the operator, riggers and crane walkers, other personnel involved in the operation, rigging gear between the hook, the load, the crane's supporting structure (i.e. ground or rail), the load's rigging path, the lift and rigging procedure.

1.2.14 Qualified Person (QP)

The QP is a person designated in writing, who, by possession of a

recognized degree, certificate, or professional standing, or extensive knowledge, training, and experience, has successfully demonstrated their ability to solve or resolve problems related to the subject matter, the work, or the project.

1.2.15 Qualified Person, Fall Protection (QP for FP)

A QP for FP is a person meeting the requirements of EM 385-1-1 Appendix Q, and ASSE/SAFE Z359.0, with a recognized degree or professional certificate and with extensive knowledge, training and experience in the fall protection and rescue field who is capable of designing, analyzing, and evaluating and specifying fall protection and rescue systems.

1.2.16 Recordable Injuries or Illnesses

Recordable Injuries or Illnesses are any work-related injury or illness that results in:

a. Death, regardless of the time between the injury and death, or the length of the illness;

b. Days away from work (any time lost after day of injury/illness onset);

c. Restricted work;

d. Transfer to another job;

e. Medical treatment beyond first aid;

f. Loss of consciousness; or

g. A significant injury or illness diagnosed by a physician or other licensed health care professional, even if it did not result in (a) through (f) above.

1.2.17 USACE Property and Equipment

Interpret "USACE" property and equipment specified in USACE EM 385-1-1 as Government property and equipment.

1.2.18 Load Handling Equipment (LHE) Accident or Load Handling Equipment Mishap

A LHE accident occurs when any one or more of the eight elements in the operating envelope fails to perform correctly during operation, including operation during maintenance or testing resulting in personnel injury or death; material or equipment damage; dropped load; derailment; two-blocking; overload; or collision, including unplanned contact between the load, crane, or other objects. A dropped load, derailment, two-blocking, overload and collision are considered accidents, even though no material damage or injury occurs. A component failure (e.g., motor burnout, gear tooth failure, bearing failure) is not considered an accident solely due to material or equipment damage unless the component failure results in damage to other components (e.g., dropped boom, dropped load, or roll over). Document any mishap that meets the criteria described in the Contractor Significant Incident Report (CSIR) using the Crane High Hazard working group mishap reporting form.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance with Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Accident Prevention Plan (APP); G

SD-06 Test Reports

Monthly Exposure Reports

Notifications and Reports

Accident Reports; G

LHE Inspection Reports

SD-07 Certificates

Crane Operators/Riggers

Standard Lift Plan; G

Critical Lift Plan ; G

Naval Architecture Analysis; G

Activity Hazard Analysis (AHA)

Confined Space Entry Permit

Hot Work Permit

Certificate of Compliance

License Certificates

Radiography Operation Planning Work Sheet; G

Portable Gauge Operations Planning Worksheet; G

1.4 MONTHLY EXPOSURE REPORTS

Provide a Monthly Exposure Report and attach to the monthly billing request. This report is a compilation of employee-hours worked each month for all site workers, both Prime and subcontractor. Failure to submit the report may result in retention of up to 10 percent of the voucher.

1.5 REGULATORY REQUIREMENTS

In addition to the detailed requirements included in the provisions of this

contract, comply with the most recent edition of USACE EM 385-1-1, and the following federal, state, and local laws, ordinances, criteria, rules and regulations. Submit matters of interpretation of standards to the appropriate administrative agency for resolution before starting work. Where the requirements of this specification, applicable laws, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirements govern.

1.6 SITE QUALIFICATIONS, DUTIES, AND MEETINGS

1.6.1 Personnel Qualifications

1.6.1.1 Site Safety and Health Officer (SSHO)

Provide one (1) dedicated person to function as the Site Safety and Health Officer (SSHO), and one (1) person to serve as the alternate SSHO. The SSHO and alternate must meet the requirements of EM 385-1-1 Section 1 and ensure that the requirements of 29 CFR 1926.16 are met for the project. The SSHO or an equally-qualified Alternate SSHO must be at the work site at all times to implement and administer the Contractor's safety program and government-accepted Accident Prevention Plan. The SSHO and Alternate SSHO must have the required training, experience, and qualifications in accordance with EM 385-1-1 Section 01.A.17, and all associated sub-paragraphs.

If the SSHO is off-site for a period longer than 24 hours, an equally-qualified alternate SSHO must be provided and must fulfill the same roles and responsibilities as the primary SSHO. When the SSHO is temporarily (up to 24 hours) off-site, a Designated Representative (DR), as identified in the AHA may be used in lieu of an Alternate SSHO, and must be on the project site at all times when work is being performed. Note that the DR is a collateral duty safety position, with safety duties in addition to their full time occupation.

1.6.1.2 Contractor Quality Control (QC) Manager:

The Contractor Quality Control Manager cannot be the SSHO on this project, even though the QC has safety inspection responsibilities as part of the QC duties.

1.6.1.3 Competent Person Qualifications

Provide Competent Persons in accordance with EM 385-1-1, Appendix Q and herein. Competent Persons for high risk activities include confined space, cranes and rigging, excavation/trenching, fall protection, and electrical work. The CP for these activities must be designated in writing, and meet the requirements for the specific activity (i.e. competent person, fall protection).

The Competent Person identified in the Contractor's Safety and Health Program and accepted Accident Prevention Plan, must be on-site at all times when the work that presents the hazards associated with their professional expertise is being performed. Provide the credentials of the Competent Persons(s) to the the Contracting Officer for information in consultation with the Safety Office.

1.6.1.3.1 Competent Person for Confined Space Entry

Provide a Confined Space (CP) Competent Person who meets the requirements

of EM 385-1-1, Appendix Q, and herein. The CP for Confined Space Entry must supervise the entry into each confined space.

1.6.1.3.2 Competent Person for Scaffolding

Provide a Competent Person for Scaffolding who meets the requirements of EM 385-1-1, Section 22.B.02 and herein.

1.6.1.3.3 Competent Person for Fall Protection

Provide a Competent Person for Fall Protection who meets the requirements of EM 385-1-1, Section 21.C.04 and herein.

1.6.1.4 Qualified Trainer Requirements

Individuals qualified to instruct the 40 hour contract safety awareness course, or portions thereof, must meet the definition of a Competent Person Trainer, and, at a minimum, possess a working knowledge of the following subject areas: EM 385-1-1, Electrical Standards,Lockout/Tagout, Fall Protection, Confined Space Entry for Construction; Excavation, Trenching and Soil Mechanics, and Scaffolds in accordance with 29 CFR 1926.450, Subpart L.

Instructors are required to:

a. Prepare class presentations that cover construction-related safety requirements.

b. Ensure that all attendees attend all sessions by using a class roster signed daily by each attendee. Maintain copies of the roster for at least five (5) years. This is a certification class and must be attended 100 percent. In cases of emergency where an attendee cannot make it to a session, the attendee can make it up in another class session for the same subject.

c. Update training course materials whenever an update of the EM 385-1-1 becomes available.

d. Provide a written exam of at least 50 questions. Students are required to answer 80 percent correctly to pass.

e. Request, review and incorporate student feedback into a continuous course improvement program.

1.6.1.5 Crane Operators/Riggers

Provide Operators meeting the requirements in EM 385-1-1, Section 15.B for Riggers and Section 16.B for Crane Operators. In addition, for mobile cranes with Original Equipment Manufacturer (OEM) rated capacities of 50,000 pounds or greater, designate crane operators qualified by a source that qualifies crane operators (i.e., union, a government agency, or an organization that tests and qualifies crane operators). Provide proof of current qualification.

1.6.2 Personnel Duties

1.6.2.1 Duties of the Site Safety and Health Officer (SSHO)

The SSHO must:

a. Conduct daily safety and health inspections and maintain a written log which includes area/operation inspected, date of inspection, identified hazards, recommended corrective actions, estimated and actual dates of corrections. Attach safety inspection logs to the Contractors' daily quality control report.

b. Conduct mishap investigations and complete required accident reports. Report mishaps and near misses.

c. Use and maintain OSHA's Form 300 to log work-related injuries and illnesses occurring on the project site for Prime Contractors and subcontractors, and make available to the Contracting Officer upon request. Post and maintain the Form 300A on the site Safety Bulletin Board.

d. Maintain applicable safety reference material on the job site.

e. Attend the pre-construction conference, pre-work meetings including preparatory meetings, and periodic in-progress meetings.

f. Review the APP and AHAs for compliance with EM 385-1-1, and approve, sign, implement and enforce them.

g. Establish a Safety and Occupational Health (SOH) Deficiency Tracking System that lists and monitors outstanding deficiencies until resolution.

h. Ensure subcontractor compliance with safety and health requirements.

i. Maintain a list of hazardous chemicals on site and their material Safety Data Sheets (SDS).

j. Maintain a weekly list of high hazard activities involving energy, equipment, excavation, entry into confined space, and elevation, and be prepared to discuss details during QC Meetings.

k. Provide and keep a record of site safety orientation and indoctrination for Contractor employees, subcontractor employees, and site visitors.

Superintendent, QC Manager, and SSHO are subject to dismissal if the above duties are not being effectively carried out. If Superintendent, QC Manager, or SSHO are dismissed, project work will be stopped and will not be allowed to resume until a suitable replacement is approved and the above duties are again being effectively carried out.

1.6.3 Meetings

1.6.3.1 Preconstruction Conference

a. Contractor representatives who have a responsibility or significant role in accident prevention on the project must attend the preconstruction conference. This includes the project superintendent, Site Safety and Occupational Health officer, quality control manager, or any other assigned safety and health professionals who participated in the development of the APP (including the Activity Hazard Analyses (AHAs) and special plans, program and procedures associated with it).

b. Discuss the details of the submitted APP to include incorporated plans,

programs, procedures and a listing of anticipated AHAs that will be developed and implemented during the performance of the contract. This list of proposed AHAs will be reviewed at the conference and an agreement will be reached between the Contractor and the Contracting Officer as to which phases will require an analysis. In addition, establish a schedule for the preparation, submittal, and Government review of AHAs to preclude project delays.

c. Deficiencies in the submitted APP, identified during the Contracting Officer's review, must be corrected, and the APP re-submitted for review prior to the start of construction. Work is not permitted to begin work until an APP is established that is acceptable to the Contracting Officer.

d. The functions of a Preconstruction conference may take place at the Post-Award Kickoff meeting for Design Build Contracts.

1.6.3.2 Safety Meetings

Conduct safety meetings to review past activities, plan for new or changed operations, review pertinent aspects of appropriate AHA (by trade), establish safe working procedures for anticipated hazards, and provide pertinent Safety and Occupational Health (SOH) training and motivation. Conduct meetings at least once a month for all supervisors on the project location. The SSHO, supervisors, foremen, or CDSOs must conduct meetings at least once a week for the trade workers. Document meeting minutes to include the date, persons in attendance, subjects discussed, and names of individual(s) who conducted the meeting. Maintain documentation on-site and furnish copies to the Contracting Officer on request. Notify the Contracting Officer of all scheduled meetings 7 calendar days in advance.

1.7 ACCIDENT PREVENTION PLAN (APP)

A qualified person must prepare the written site-specific APP. Prepare the APP in accordance with the format and requirements of EM 385-1-1, Appendix A, and as supplemented herein. Cover all paragraph and subparagraph elements in EM 385-1-1, Appendix A. The APP must be job-specific and address any unusual or unique aspects of the project or activity for which it is written. The APP must interface with the Contractor's overall safety and health program referenced in the APP in the applicable APP element, and made site-specific. Describe the methods to evaluate past safety performance of potential subcontractors in the selection process. Also, describe innovative methods used to ensure and monitor safe work practices of subcontractors. The Government considers the Prime Contractor to be the "controlling authority" for all work site safety and health of the subcontractors. Contractors are responsible for informing their subcontractors of the safety provisions under the terms of the contract and the penalties for noncompliance, coordinating the work to prevent one craft from interfering with or creating hazardous working conditions for other crafts, and inspecting subcontractor operations to ensure that accident prevention responsibilities are being carried out. The APP must be signed by an officer of the firm (Prime Contractor senior person), the individual preparing the APP, the on-site superintendent, the designated SSHO, the Contractor Quality Control Manager, and any designated Certified Safety Professional (CSP) or Certified Health Physicist (CIH). The SSHO must provide and maintain the APP and a log of signatures by each subcontractor foreman, attesting that they have read and understand the APP, and make the APP and log available on-site to the Contracting Officer. If English is not the foreman's primary language, the Prime Contractor must provide an

interpreter.

Submit the APP to the Contracting Officer 15 calendar days prior to the date of the preconstruction conference for acceptance. Work cannot proceed without an accepted APP. Once reviewed and accepted by the Contracting Officer, the APP and attachments will be enforced as part of the contract. Disregarding the provisions of this contract or the accepted APP is cause for stopping of work, at the discretion of the Contracting Officer, until the matter has been rectified. Continuously review and amend the APP, as necessary, throughout the life of the contract. Changes to the accepted APP must be made with the knowledge and concurrence of the Contracting Officer, project superintendent, SSHO and Quality Control Manager. Incorporate unusual or high-hazard activities not identified in the original APP as they are discovered. Should any severe hazard exposure (i.e. imminent danger) become evident, stop work in the area, secure the area, and develop a plan to remove the exposure and control the hazard. Notify the Contracting Officer within 24 hours of discovery. Eliminate and remove the hazard. In the interim, take all necessary action to restore and maintain safe working conditions in order to safeguard onsite personnel, visitors, the public (as defined by ASSE/SAFE A10.34), and the environment.

1.7.1 Names and Qualifications

Provide plans in accordance with the requirements outlined in Appendix A of EM 385-1-1, including the following:

a. Names and qualifications (resumes including education, training, experience and certifications) of site safety and health personnel designated to perform work on this project to include the designated Site Safety and Health Officer and other competent and qualified personnel to be used. Specify the duties of each position.

b. Qualifications of competent and of qualified persons. As a minimum, designate and submit qualifications of competent persons for each of the following major areas: excavation; scaffolding; fall protection; hazardous energy; confined space; health hazard recognition, evaluation and control of chemical, physical and biological agents; and personal protective equipment and clothing to include selection, use and maintenance.

1.7.2 Plans

Provide plans in the APP in accordance with the requirements outlined in Appendix A of EM 385-1-1, including the following:

1.7.2.1 Confined Space Entry Plan

Develop a confined or enclosed space entry plan in accordance with EM 385-1-1, applicable OSHA standards 29 CFR 1910, 29 CFR 1915, and 29 CFR 1926, OSHA Directive CPL 2.100, and any other federal, state and local regulatory requirements identified in this contract. Identify the qualified person's name and qualifications, training, and experience. Delineate the qualified person's authority to direct work stoppage in the event of hazardous conditions. Include procedure for rescue by contractor personnel and the coordination with emergency responders. (If there is no confined space work, include a statement that no confined space work exists and none will be created.)

1.7.2.2 Standard Lift Plan (SLP)

Plan lifts to avoid situations where the operator cannot maintain safe control of the lift. Prepare a written SLP in accordance with EM 385-1-1, Section 16.A.03, using Form 16-2 for every lift or series of lifts (if duty cycle or routine lifts are being performed). The SLP must be developed, reviewed and accepted by all personnel involved in the lift in conjunction with the associated AHA. Signature on the AHA constitutes acceptance of the plan. Maintain the SLP on the LHE for the current lift(s) being made. Maintain historical SLPs for a minimum of 3 months.

1.7.2.3 Critical Lift Plan - Crane or Load Handling Equipment

Provide a Critical Lift Plan as required by EM 385-1-1, Section 16.H.01, using Form 16-3. Critical lifts require detailed planning and additional or unusual safety precautions. Develop and submit a critical lift plan to the Contracting Officer 30 calendar days prior to critical lift. Comply with load testing requirements in accordance with EM 385-1-1, Section 16.F.03.

In addition to the requirements of EM 385-1-1, Section 16.H.02, the critical lift plan must include the following:

a. For lifts of personnel, demonstrate compliance with the requirements of 29 CFR 1926.1400 and EM 385-1-1, Section 16.T.

b. For barge mounted mobile cranes, provide a Naval Architecture Analysis and include an LHE Manufacturer's Floating Service Load Chart in accordance with the criteria from the selected standard in EM 385-1-1, Section 16.L.02. The Floating Service Load Chart must provide a table of rated load versus boom angle and radius. The Floating Service Load Chart must also provide the maximum allowable machine list and trim associated with the tabular loads and radii provided. If the Manufacturer's Floating Service Load Chart is not available, a floating service load chart may be developed and provided by a qualified Registered Professional Engineer (RPE), competent in the field of floating cranes. The Load Chart must be in accordance with the criteria from the selected standard in EM 385-1-1, Section 16.L; provide a table of rated load versus boom angle and radius; provide the maximum allowable machine list and machine trim associated with the tabular loads and radii provided; and be stamped by a RPE qualified and competent in the field of floating cranes. The RPE, competent in the field of floating cranes must stamp and certify (sign) that the Naval Architectural Analysis (NAA) meets the requirements of EM 385-1-1, Section 16.L.03.

c. Multi-purpose machines, material handling equipment, and construction equipment used to lift loads that are suspended by rigging gear, require proof of authorization from the machine OEM that the machine is capable of making lifts of loads suspended by rigging equipment. Demonstrate that the operator is properly trained and that the equipment is properly configured to make such lifts and is equipped with a load chart.

1.7.2.4 Fall Protection and Prevention (FP&P) Plan

The plan must comply with the requirements of EM 385-1-1, Section 21.D and ASSE/SAFE Z359.2, be site specific, and address all fall hazards in the work place and during different phases of construction. Address how to

protect and prevent workers from falling to lower levels when they are exposed to fall hazards above 6 feet. A competent person or qualified person for fall protection must prepare and sign the plan documentation. Include fall protection and prevention systems, equipment and methods employed for every phase of work, roles and responsibilities, assisted rescue, self-rescue and evacuation procedures, training requirements, and monitoring methods. Review and revise, as necessary, the Fall Protection and Prevention Plan documentation as conditions change, but at a minimum every six months, for lengthy projects, reflecting any changes during the course of construction due to changes in personnel, equipment, systems or work habits. Keep and maintain the accepted Fall Protection and Prevention Plan documentation at the job site for the duration of the project. Include the Fall Protection and Prevention Plan documentation in the Accident Prevention Plan (APP).

1.7.2.5 Rescue and Evacuation Plan

Provide a Rescue and Evacuation Plan in accordance with EM 385-1-1 Section 21.N and ASSE/SAFE Z359.2, and include in the FP&P Plan and as part of the APP. Include a detailed discussion of the following: methods of rescue; methods of self-rescue; equipment used; training requirement; specialized training for the rescuers; procedures for requesting rescue and medical assistance; and transportation routes to a medical facility.

1.7.2.6 Hazardous Energy Control Program (HECP)

Develop a HECP in accordance with EM 385-1-1 Section 12, 29 CFR 1910.147, 29 CFR 1910.333, 29 CFR 1915.89, ASSE/SAFE Z244.1, and ASSE/SAFE A10.44. Submit this HECP as part of the Accident Prevention Plan (APP). Conduct a preparatory meeting and inspection with all effected personnel to coordinate all HECP activities. Document this meeting and inspection in accordance with EM 385-1-1, Section 12.A.02. Ensure that each employee is familiar with and complies with these procedures.

1.7.2.7 Excavation Plan

Identify the safety and health aspects of excavation, and provide and prepare the plan in accordance with EM 385-1-1, Section 25.A and Section 31 00 00 EARTHWORK.

[1.7.2.8 Occupant Protection Plan

Identify the safety and health aspects of lead-based paint removal, prepared in accordance with Section 02 83 19.00 10 LEAD BASED PAINT HAZARD ABATEMENT, TARGET HOUSING & CHILD OCCUPIED FACILITIES.

][1.7.2.9 Asbestos Hazard Abatement Plan

Identify the safety and health aspects of asbestos work, and prepare in accordance with Section 02 82 13.00 10 ASBESTOS ABATEMENT.

][1.7.2.10 PCB Plan

Identify the safety and health aspects of Polychlorinated Biphenyls work, and prepare in accordance with Sections 02 84 33 REMOVAL AND DISPOSAL OF POLYCHLORINATED BIPHENYLS (PCBs) and 02 61 23 REMOVAL AND DISPOSAL OF PCB CONTAMINATED SOILS.

][1.7.2.11 Site Demolition Plan

Identify the safety and health aspects, and prepare in accordance with Section 02 41 00 [DEMOLITION] [AND] [DECONSTRUCTION] and referenced sources.

]1.8 ACTIVITY HAZARD ANALYSIS (AHA)

Before beginning each activity, task or Definable Feature of Work (DFOW) involving a type of work presenting hazards not experienced in previous project operations, or where a new work crew or subcontractor is to perform the work, the Contractor(s) performing that work activity must prepare an AHA. AHAs must be developed by the Prime Contractor, subcontractor, or supplier performing the work, and provided for Prime Contractor review and approval before submitting to the Contracting Officer. AHAs must be signed by the SSHO, Superintendent, QC Manager and the subcontractor Foreman performing the work. Format the AHA in accordance with EM 385-1-1, Section 1 or as directed by the Contracting Officer. Submit the AHA for review at least 15 working days prior to the start of each activity task, or DFOW. The Government reserves the right to require the Contractor to revise and resubmit the AHA if it fails to effectively identify the work sequences, specific anticipated hazards, site conditions, equipment, materials, personnel and the control measures to be implemented.

AHAs must identify competent persons required for phases involving high risk activities, including confined entry, crane and rigging, excavations, trenching, electrical work, fall protection, and scaffolding.

1.8.1 AHA Management

Review the AHA list periodically (at least monthly) at the Contractor supervisory safety meeting, and update as necessary when procedures, scheduling, or hazards change. Use the AHA during daily inspections by the SSHO to ensure the implementation and effectiveness of the required safety and health controls for that work activity.

1.8.2 AHA Signature Log

Each employee performing work as part of an activity, task or DFOW must review the AHA for that work and sign a signature log specifically maintained for that AHA prior to starting work on that activity. The SSHO must maintain a signature log on site for every AHA. Provide employees whose primary language is other than English, with an interpreter to ensure a clear understanding of the AHA and its contents.

1.9 DISPLAY OF SAFETY INFORMATION

1.9.1 Safety Bulletin Board

Within one calendar day(s) after commencement of work, erect a safety bulletin board at the job site. Where size, duration, or logistics of project do not facilitate a bulletin board, an alternative method, acceptable to the Contracting Officer, that is accessible and includes all mandatory information for employee and visitor review, may be deemed as meeting the requirement for a bulletin board. Include and maintain information on safety bulletin board as required by EM 385-1-1, Section 01.A.07. Additional items required to be posted include:

a. Confined space entry permit.

b. Hot work permit.

1.9.2 Safety and Occupational Health (SOH) Deficiency Tracking System

Establish a SOH deficiency tracking system that lists and monitors the status of SOH deficiencies in chronological order. Use the tracking system to evaluate the effectiveness of the APP. A monthly evaluation of the data must be discussed in the QC or SOH meeting with everyone on the project. The list must be posted on the project bulletin board and updated daily, and provide the following information:

a. Date deficiency identified;

b. Description of deficiency;

c. Name of person responsible for correcting deficiency;

d. Projected resolution date;

e. Date actually resolved.

1.10 SITE SAFETY REFERENCE MATERIALS

Maintain safety-related references applicable to the project, including those listed in paragraph REFERENCES. Maintain applicable equipment manufacturer's manuals.

1.11 EMERGENCY MEDICAL TREATMENT

Contractors must arrange for their own emergency medical treatment. Government has no responsibility to provide emergency medical treatment.

1.12 NOTIFICATIONS and REPORTS

1.12.1 Mishap Notification

Notify the Contracting Officer as soon as practical, but no more than twenty-four hours, after any mishaps, including recordable accidents, incidents, and near misses, as defined in EM 385-1-1 Appendix Q, any report of injury, illness, load handling equipment (LHE) or rigging mishaps, or any property damage. The Contractor is responsible for obtaining appropriate medical and emergency assistance and for notifying fire, law enforcement, and regulatory agencies. Immediate reporting is required for electrical mishaps, to include Arc Flash; shock; uncontrolled release of hazardous energy (includes electrical and non-electrical); load handling equipment or rigging; fall from height (any level other than same surface); and underwater diving. These mishaps must be investigated in depth to identify all causes and to recommend hazard control measures.

Within notification include Contractor name; contract title; type of contract; name of activity, installation or location where accident occurred; date and time of accident; names of personnel injured; extent of property damage, if any; extent of injury, if known, and brief description of accident (for example, type of construction equipment used and PPE used). Preserve the conditions and evidence on the accident site until the Government investigation team arrives on-site and Government investigation is conducted. Assist and cooperate fully with the Government's investigation(s) of any mishap.

1.12.2 Accident Reports

a. Conduct an accident investigation for recordable injuries and illnesses, property damage, and near misses as defined in EM 385-1-1, to establish the root cause(s) of the accident. Complete the applicable USACE Accident Report Form 3394, and provide the report to the Contracting Officer within 5 calendar day(s) of the accident. The Contracting Officer will provide copies of any required or special forms.

b. Near Misses: [For Army projects, report all "Near Misses" to the GDA, using local mishap reporting procedures, within 24 hrs. The Contracting Officer will provide the Contractor the required forms.] Near miss reports are considered positive and proactive Contractor safety management actions.

c. Conduct an accident investigation for any load handling equipment accident (including rigging gear accidents) to establish the root cause(s) of the accident. Complete the LHE Accident Report (Crane and Rigging Gear) form and provide the report to the Contracting Officer within 30 calendar days of the accident. Do not proceed with crane operations until cause is determined and corrective actions have been implemented to the satisfaction of the Contracting Officer. The Contracting Officer will provide a blank copy of the accident report form.

1.12.3 LHE Inspection Reports

Submit LHE inspection reports required in accordance with EM 385-1-1 and as specified herein with Daily Reports of Inspections.

1.12.4 Certificate of Compliance and Pre-lift Plan/Checklist for LHE and Rigging

Provide a FORM 16-1 Certificate of Compliance for LHE entering an activity under this contract and in accordance with EM 385-1-1. Post certifications on the crane.

Develop a Standard Lift Plan (SLP) in accordance with EM 385-1-1, Section 16.H.03 using Form 16-2 Standard Pre-Lift Crane Plan/Checklist for each lift planned. Submit SLP to the Contracting Officer for approval within 15 calendar days in advance of planned lift.

1.13 HOT WORK

1.13.1 Permit and Personnel Requirements

Submit and obtain a written permit prior to performing "Hot Work" (i.e. welding or cutting) or operating other flame-producing/spark producing devices, from the Fire Marshall. A permit is required from the Explosives Safety Office for work in and around where explosives are processed, stored, or handled. CONTRACTORS ARE REQUIRED TO MEET ALL CRITERIA BEFORE A PERMIT IS ISSUED. Provide at least two 20 pound 4A:20 BC rated extinguishers for normal "Hot Work". The extinguishers must be current inspection tagged, and contain an approved safety pin and tamper resistant seal. It is also mandatory to have a designated FIRE WATCH for any "Hot Work" done at this activity. The Fire Watch must be trained in accordance with NFPA 51B and remain on-site for a minimum of one hour after completion of the task or as specified on the hot work permit.

When starting work in the facility, require personnel to familiarize themselves with the location of the nearest fire alarm boxes and place in memory the emergency Fire Marshall's phone number. REPORT ANY FIRE, NO MATTER HOW SMALL, TO THE RESPONSIBLE FIRE MARSHALL IMMEDIATELY.

1.13.2 Work Around Flammable Materials

Obtain services from a NFPA Certified Marine Chemist for "HOT WORK" within or around flammable materials (such as fuel systems or welding/cutting on fuel pipes) or confined spaces (such as sewer wet wells, manholes, or vaults) that have the potential for flammable or explosive atmospheres.

Whenever these materials, except beryllium and chromium (VI), are encountered in indoor operations, local mechanical exhaust ventilation systems that are sufficient to reduce and maintain personal exposures to within acceptable limits must be used and maintained in accordance with manufacturer's instruction and supplemented by exceptions noted in EM 385-1-1, Section 06.H

1.14 RADIATION SAFETY REQUIREMENTS

Submit License Certificates, employee training records, and Leak Test Reports for radiation materials and equipment to the Contracting Officer and Radiation Safety Office (RSO)for all specialized and licensed material and equipment proposed for use on the construction project (excludes portable machine sources of ionizing radiation including moisture density and X-Ray Fluorescence (XRF)). Maintain on-site records whenever licensed radiological materials or ionizing equipment are on government property.

Protect workers from radiation exposure in accordance with 10 CFR 20, ensuring any personnel exposures are maintained As Low As Reasonably Achievable.

1.14.1 Radiography Operation Planning Work Sheet

Submit a Gamma and X-Ray Radiography Operation Planning Work Sheet to Contracting Officer 14 days prior to commencement of operations involving radioactive materials or radiation generating devices. For portable machine sources of ionizing radiation, including moisture density and XRF, use and submit the Portable Gauge Operations Planning Worksheet instead. The Contracting Officer will review the submitted worksheet and provide questions and comments.

Contractors must use primary dosimeters process by a National Voluntary Laboratory Accreditation Program (NVLAP) accredited laboratory.

1.14.2 Site Access and Security

Coordinate site access and security requirements with the Contracting Officer for all radiological materials and equipment containing ionizing radiation that are proposed for use on a government facility. For gamma radiography materials and equipment, a Government escort is required for any travels on the Installation. The Government authorized representative will meet the Contractor at a designated location outside the Installation, ensure safety of the materials being transported, and will escort the Contractor for gamma sources onto the Installation, to the job site, and off the Installation. For portable machine sources of ionizing radiation, including moisture density and XRF, the Government authorized

representative will meet the Contractor at the job site.

Provide a copy of all calibration records, and utilization records for radiological operations performed on the site.

1.14.3 Loss or Release and Unplanned Personnel Exposure

Loss or release of radioactive materials, and unplanned personnel exposures must be reported immediately to the Contracting Officer, RSO, and Base Security Department Emergency Number.

1.14.4 Site Demarcation and Barricade

Properly demark and barricade an area surrounding radiological operations to preclude personnel entrance, in accordance with EM 385-1-1, Nuclear Regulatory Commission, and Applicable State regulations and license requirements, and in accordance with requirements established in the accepted Radiography Operation Planning Work Sheet.

Do not close or obstruct streets, walks, and other facilities occupied and used by the Government without written permission from the Contracting Officer.

1.14.5 Security of Material and Equipment

Properly secure the radiological material and ionizing radiation equipment at all times, including keeping the devices in a properly marked and locked container, and secondarily locking the container to a secure point in the Contractor's vehicle or other approved storage location during transportation and while not in use. While in use, maintain a continuous visual observation on the radiological material and ionizing radiation equipment. In instances where radiography is scheduled near or adjacent to buildings or areas having limited access or one-way doors, make no assumptions as to building occupancy. Where necessary, the Contracting Officer will direct the Contractor to conduct an actual building entry, search, and alert. Where removal of personnel from such a building cannot be accomplished and it is otherwise safe to proceed with the radiography, position a fully instructed employee inside the building or area to prevent exiting while external radiographic operations are in process.

1.14.6 Transportation of Material

Comply with 49 CFR 173 for Transportation of Regulated Amounts of Radioactive Material. Notify Local Fire authorities and the site Radiation Safety officer (RSO) of any Radioactive Material use.

1.14.7 Schedule for Exposure or Unshielding

Actual exposure of the radiographic film or unshielding the source must not be initiated until after 5 p.m. on weekdays.

1.14.8 Transmitter Requirements

Adhere to the base policy concerning the use of transmitters, such as radios and cell phones. Obey Emissions control (EMCON) restrictions.

1.15 CONFINED SPACE ENTRY REQUIREMENTS.

Confined space entry must comply with Section 34 of EM 385-1-1, OSHA

29 CFR 1926, OSHA 29 CFR 1910, OSHA 29 CFR 1910.146, and OSHA Directive CPL 2.100. Any potential for a hazard in the confined space requires a permit system to be used.

1.15.1 Entry Procedures

Prohibit entry into a confined space by personnel for any purpose, including hot work, until the qualified person has conducted appropriate tests to ensure the confined or enclosed space is safe for the work intended and that all potential hazards are controlled or eliminated and documented. Comply with EM 385-1-1, Section 34 for entry procedures. Hazards pertaining to the space must be reviewed with each employee during review of the AHA.

1.15.2 Forced Air Ventilation

Forced air ventilation is required for all confined space entry operations and the minimum air exchange requirements must be maintained to ensure exposure to any hazardous atmosphere is kept below its action level.

1.15.3 Sewer Wet Wells

Sewer wet wells require continuous atmosphere monitoring with audible alarm for toxic gas detection.

1.15.4 Rescue Procedures and Coordination with Local Emergency Responders

Develop and implement an on-site rescue and recovery plan and procedures. The rescue plan must not rely on local emergency responders for rescue from a confined space.

1.16 DIVE SAFETY REQUIREMENTS

Develop a Dive Operations Plan, AHA, emergency management plan, and personnel list that includes qualifications, for each separate diving operation. Submit these documents to the District Dive Coordinator (DDC) for review and acceptance at least 15 working days prior to commencement of diving operations. These documents must be at the diving location at all times. Provide each of these documents as a part of the project file.

1.17 SEVERE STORM PLAN

In the event of a severe storm warning, the Contractor must:

a. Secure outside equipment and materials and place materials that could be damaged in protected areas.

b. Check surrounding area, including roof, for loose material, equipment, debris, and other objects that could be blown away or against existing facilities.

c. Ensure that temporary erosion controls are adequate.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 CONSTRUCTION AND OTHER WORK

Comply with EM 385-1-1, NFPA 70, NFPA 70E, NFPA 241, the APP, the AHA, Federal and State OSHA regulations, and other related submittals and activity fire and safety regulations. The most stringent standard prevails.

PPE is governed in all areas by the nature of the work the employee is performing. Use personal hearing protection at all times in designated noise hazardous areas or when performing noise hazardous tasks. Safety glasses must be worn or carried/available on each person. Mandatory PPE includes:

a. Hard Hat

b. Long Pants

c. Appropriate Safety Shoes

d. Appropriate Class Reflective Vests

3.1.1 Worksite Communication

Employees working alone in a remote location or away from other workers must be provided an effective means of emergency communications (i.e., cellular phone, two-way radios, land-line telephones or other acceptable means). The selected communication must be readily available (easily within the immediate reach) of the employee and must be tested prior to the start of work to verify that it effectively operates in the area/environment. An employee check-in/check-out communication procedure must be developed to ensure employee safety.

3.1.2 Hazardous Material Exclusions

Notwithstanding any other hazardous material used in this contract, radioactive materials or instruments capable of producing ionizing/non-ionizing radiation (with the exception of radioactive material and devices used in accordance with EM 385-1-1 such as nuclear density meters for compaction testing and laboratory equipment with radioactive sources) as well as materials which contain asbestos, mercury or polychlorinated biphenyls, di-isocyanates, lead-based paint, and hexavalent chromium, are prohibited. The Contracting Officer, upon written request by the Contractor, may consider exceptions to the use of any of the above excluded materials. Low mercury lamps used within fluorescent lighting fixtures are allowed as an exception without further Contracting Officer approval. Notify the Radiation Safety Officer (RSO) prior to excepted items of radioactive material and devices being brought on base.

3.1.3 Unforeseen Hazardous Material

Contract documents identify materials such as PCB, lead paint, and friable and non-friable asbestos and other OSHA regulated chemicals (i.e. 29 CFR Part 1910.1000). If material(s) that may be hazardous to human health upon disturbance are encountered during construction operations, stop that portion of work and notify the Contracting Officer immediately. Within 14 calendar days the Government will determine if the material is hazardous. If material is not hazardous or poses no danger, the Government will direct the Contractor to proceed without change. If material is hazardous and

handling of the material is necessary to accomplish the work, the Government will issue a modification pursuant to FAR 52.243-4, "Changes" and FAR 52.236-2, "Differing Site Conditions."

3.2 PRE-OUTAGE COORDINATION MEETING

Apply for utility outages at least 15 days in advance. As a minimum, the request must include the location of the outage, utilities being affected, duration of outage and any necessary sketches. Special requirements for electrical outage requests are contained elsewhere in this specification section. Once approved, and prior to beginning work on the utility system requiring shut down, attend a pre-outage coordination meeting with the Contracting Officer [and the[Installation representative][Public Utilities representative]]to review the scope of work and the lock-out/tag-out procedures for worker protection. No work will be performed on energized electrical circuits unless proof is provided that no other means exist.

3.3 CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT)

Provide and operate a Hazardous Energy Control Program (HECP) in accordance with EM 385-1-1 Section 12, 29 CFR 1910.333, 29 CFR 1915.89, and paragraph HAZARDOUS ENERGY CONTROL PROGRAM (HECP).

3.4 FALL PROTECTION PROGRAM

Establish a fall protection program, for the protection of all employees exposed to fall hazards. Within the program include company policy, identify roles and responsibilities, education and training requirements, fall hazard identification, prevention and control measures, inspection, storage, care and maintenance of fall protection equipment and rescue and evacuation procedures in accordance with ASSE/SAFE Z359.2 and EM 385-1-1, Sections 21.A and 21.D.

3.4.1 Training

Institute a fall protection training program. As part of the Fall Protection Program, provide training for each employee who might be exposed to fall hazards. Provide training by a competent person for fall protection in accordance with EM 385-1-1, Section 21.C. Document training and practical application of the competent person in accordance with EM 385-1-1, Section 21.C.04 and ASSE/SAFE Z359.2 in the AHA.

3.4.2 Fall Protection Equipment and Systems

Enforce use of personal fall protection equipment and systems designated (to include fall arrest, restraint, and positioning) for each specific work activity in the Site Specific Fall Protection and Prevention Plan and AHA at all times when an employee is exposed to a fall hazard. Protect employees from fall hazards as specified in EM 385-1-1, Section 21.

Provide personal fall protection equipment, systems, subsystems, and components that comply with EM 385-1-1 Section 21.I, 29 CFR 1926.500 Subpart M,ASSE/SAFE Z359.0, ASSE/SAFE Z359.1, ASSE/SAFE Z359.2, ASSE/SAFE Z359.3, ASSE/SAFE Z359.4, ASSE/SAFE Z359.6, ASSE/SAFE Z359.7, ASSE/SAFE Z359.11, ASSE/SAFE Z359.12, ASSE/SAFE Z359.13, ASSE/SAFE Z359.14, and ASSE/SAFE Z359.15.

3.4.2.1 Additional Personal Fall Protection

In addition to the required fall protection systems, other protection such as safety skiffs, personal floatation devices, and life rings, are required when working above or next to water in accordance with EM 385-1-1, Sections 21.O through 21.O.06. Personal fall protection systems and equipment are required when working from an articulating or extendible boom, swing stages, or suspended platform. In addition, personal fall protection systems are required when operating other equipment such as scissor lifts. The need for tying-off in such equipment is to prevent ejection of the employee from the equipment during raising, lowering, travel, or while performing work.

3.4.2.2 Personal Fall Protection Harnesses

Only a full-body harness with a shock-absorbing lanyard or self-retracting lanyard is an acceptable personal fall arrest body support device. The use of body belts is not acceptable. Harnesses must have a fall arrest attachment affixed to the body support (usually a Dorsal D-ring) and specifically designated for attachment to the rest of the system. Snap hooks and carabiners must be self-closing and self-locking, capable of being opened only by at least two consecutive deliberate actions and have a minimum gate strength of 3,600 lbs in all directions. Use webbing, straps, and ropes made of synthetic fiber. The maximum free fall distance when using fall arrest equipment must not exceed 6 feet, unless the proper energy absorbing lanyard is used. Always take into consideration the total fall distance and any swinging of the worker (pendulum-like motion), that can occur during a fall, when attaching a person to a fall arrest system. All full body harnesses must be equipped with Suspension Trauma Preventers such as stirrups, relief steps, or similar in order to provide short-term relief from the effects of orthostatic intolerance in accordance with EM 385-1-1, Section 21.I.06.

3.4.3 Fall Protection for Roofing Work

Implement fall protection controls based on the type of roof being constructed and work being performed. Evaluate the roof area to be accessed for its structural integrity including weight-bearing capabilities for the projected loading.

a. Low Sloped Roofs:

(1) For work within 6 feet of an edge, on a roof having a slope less than or equal to 4:12 (vertical to horizontal), protect personnel from falling by use of personal fall arrest/restraint systems, guardrails, or safety nets. A safety monitoring system is not adequate fall protection and is not authorized. Provide in accordance with 29 CFR 1926.500.

(2) For work greater than 6 feet from an edge, erect and install warning lines in accordance with 29 CFR 1926.500 and EM 385-1-1, Section L.

b. Steep-Sloped Roofs: Work on a roof having a slope greater than 4:1 (vertical to horizontal) requires a personal fall arrest system, guardrails with toe-boards, or safety nets. This requirement also applies to residential or housing type construction.

3.4.4 Horizontal Lifelines (HLL)

Provide HLL in accordance with EM 385-1-1, Section 21.I.08.d.2. Commercially manufactured horizontal lifelines (HLL) must be designed, installed, certified and used, under the supervision of a qualified person, for fall protection as part of a complete fall arrest system which maintains a safety factor of 2 (29 CFR 1926.500). The competent person for fall protection may (if deemed appropriate by the qualified person) supervise the assembly, disassembly, use and inspection of the HLL system under the direction of the qualified person. Locally manufactured HLLs are not acceptable unless they are custom designed for limited or site specific applications by a Registered Professional Engineer who is qualified in designing HLL systems.

3.4.5 Guardrails and Safety Nets

Design, install and use guardrails and safety nets in accordance with EM 385-1-1, Section 21.F.01 and 29 CFR 1926 Subpart M.

3.4.6 Rescue and Evacuation Plan and Procedures

When personal fall arrest systems are used, ensure that the mishap victim can self-rescue or can be rescued promptly should a fall occur. Prepare a Rescue and Evacuation Plan and include a detailed discussion of the following: methods of rescue; methods of self-rescue or assisted-rescue; equipment used; training requirement; specialized training for the rescuers; procedures for requesting rescue and medical assistance; and transportation routes to a medical facility. Include the Rescue and Evacuation Plan within the Activity Hazard Analysis (AHA) for the phase of work, in the Fall Protection and Prevention (FP&P) Plan, and the Accident Prevention Plan (APP). The plan must comply with the requirements of EM 385-1-1, ASSE/SAFE Z359.2, and ASSE/SAFE Z359.4.

3.5 WORK PLATFORMS

3.5.1 Scaffolding

Provide employees with a safe means of access to the work area on the scaffold. Climbing of any scaffold braces or supports not specifically designed for access is prohibited. Comply with the following requirements:

a. Scaffold platforms greater than 20 feet in height must be accessed by use of a scaffold stair system.

b. Ladders commonly provided by scaffold system manufacturers are prohibited for accessing scaffold platforms greater than 20 feet maximum in height.

c. An adequate gate is required.

d. Employees performing scaffold erection and dismantling must be qualified.

e. Scaffold must be capable of supporting at least four times the maximum intended load or without appropriate fall protection as delineated in the accepted fall protection and prevention plan.

f. Stationary scaffolds must be attached to structural building components to safeguard against tipping forward or backward.

g. Special care must be given to ensure scaffold systems are not overloaded.

h. Side brackets used to extend scaffold platforms on self-supported scaffold systems for the storage of material are prohibited. The first tie-in must be at the height equal to 4 times the width of the smallest dimension of the scaffold base.

i. Scaffolding other than suspended types must bear on base plates upon wood mudsills (2 in x 10 in x 8 in minimum) or other adequate firm foundation.

j. Scaffold or work platform erectors must have fall protection during the erection and dismantling of scaffolding or work platforms that are more than 6 feet.

k. Delineate fall protection requirements when working above 6 feet or above dangerous operations in the Fall Protection and Prevention (FP&P) Plan and Activity Hazard Analysis (AHA) for the phase of work.

3.5.2 Elevated Aerial Work Platforms (AWPs)

Workers must be anchored to the basket or bucket in accordance with manufacturer's specifications and instructions (anchoring to the boom may only be used when allowed by the manufacturer and permitted by the CP). Lanyards used must be sufficiently short to prohibit worker from climbing out of basket. The climbing of rails is prohibited. Lanyards with built-in shock absorbers are acceptable. Self-retracting devices are not acceptable. Tying off to an adjacent pole or structure is not permitted unless a safe device for 100 percent tie-off is used for the transfer.

Use of AWPs must be operated, inspected, and maintained as specified in the operating manual for the equipment and delineated in the AHA. Operators of AWPs must be designated as qualified operators by the Prime Contractor. Maintain proof of qualifications on site for review and include in the AHA.

3.6 EQUIPMENT

3.6.1 Material Handling Equipment (MHE)

a. Material handling equipment such as forklifts must not be modified with work platform attachments for supporting employees unless specifically delineated in the manufacturer's printed operating instructions. Material handling equipment fitted with personnel work platform attachments are prohibited from traveling or positioning while personnel are working on the platform.

b. The use of hooks on equipment for lifting of material must be in accordance with manufacturer's printed instructions. Material Handling Equipment Operators must be trained in accordance with OSHA 29 CFR 1910, Subpart N.

c. Operators of forklifts or power industrial trucks must be licensed in accordance with OSHA.

3.6.2 Load Handling Equipment (LHE)

a. Equip cranes and derricks as specified in EM 385-1-1, Section 16.

b. Notify the Contracting Officer 15 working days in advance of any LHE entering the activity, in accordance with EM 385-1-1, Section 16.A.02, so that necessary quality assurance spot checks can be coordinated.Contractor's operator must remain with the crane during the spot check. Rigging gear must comply with OSHA, ASME B30.9 Standards and host country safety standards.

c. Comply with the LHE manufacturer's specifications and limitations for erection and operation of cranes and hoists used in support of the work. Perform erection under the supervision of a designated person (as defined in ASME B30.5). Perform all testing in accordance with the manufacturer's recommended procedures.

d. Comply with ASME B30.5 for mobile and locomotive cranes, ASME B30.22 for articulating boom cranes, ASME B30.3 for construction tower cranes, ASME B30.8 for floating cranes and floating derricks, ASME B30.9 for slings, ASME B30.20 for below the hook lifting devices and ASME B30.26 for rigging hardware.

e. Under no circumstance must a Contractor make a lift at or above 90 percent of the cranes rated capacity in any configuration.

f. When operating in the vicinity of overhead transmission lines, operators and riggers must be alert to this special hazard and follow the requirements of EM 385-1-1 Section 11, and ASME B30.5 or ASME B30.22 as applicable.

g. Do not use crane suspended personnel work platforms (baskets) unless the Contractor proves that using any other access to the work location would provide a greater hazard to the workers or is impossible. Do not lift personnel with a line hoist or friction crane. Additionally, submit a specific AHA for this work to the Contracting Officer. Ensure the activity and AHA are thoroughly reviewed by all involved personnel.

h. Inspect, maintain, and recharge portable fire extinguishers as specified in NFPA 10, Standard for Portable Fire Extinguishers.

i. All employees must keep clear of loads about to be lifted and of suspended loads.

j. Use cribbing when performing lifts on outriggers.

k. The crane hook/block must be positioned directly over the load. Side loading of the crane is prohibited.

l. A physical barricade must be positioned to prevent personnel access where accessible areas of the LHE's rotating superstructure poses a risk of striking, pinching or crushing personnel.

m. Maintain inspection records in accordance by EM 385-1-1, Section 16.D, including shift, monthly, and annual inspections, the signature of the person performing the inspection, and the serial number or other identifier of the LHE that was inspected. Records must be available for review by the Contracting Officer.

n. Maintain written reports of operational and load testing in accordance with EM 385-1-1, Section 16.F, listing the load test procedures used along with any repairs or alterations performed on the LHE. Reports

must be available for review by the Contracting Officer.

o. Certify that all LHE operators have been trained in proper use of all safety devices (e.g. anti-two block devices).

p. Take steps to ensure that wind speed does not contribute to loss of control of the load during lifting operations. At wind speeds greater than 20 mph, the operator, rigger and lift supervisor must cease all crane operations, evaluate conditions and determine if the lift may proceed. Base the determination to proceed or not on wind calculations per the manufacturer and a reduction in LHE rated capacity if applicable. Include this maximum wind speed determination as part of the activity hazard analysis plan for that operation.

3.6.3 Machinery and Mechanized Equipment

a. Proof of qualifications for operator must be kept on the project site for review.

b. Manufacture specifications or owner's manual for the equipment must be on-site and reviewed for additional safety precautions or requirements that are sometimes not identified by OSHA or USACE EM 385-1-1. Incorporate such additional safety precautions or requirements into the AHAs.

3.6.4 USE OF EXPLOSIVES

Explosives must not be used or brought to the project site without prior written approval from the Contracting Officer. Such approval does not relieve the Contractor of responsibility for injury to persons or for damage to property due to blasting operations.

Storage of explosives, when permitted on Government property, must be only where directed and in approved storage facilities. These facilities must be kept locked at all times except for inspection, delivery, and withdrawal of explosives.

3.7 EXCAVATIONS

Soil classification must be performed by a competent person in accordance with 29 CFR 1926 and EM 385-1-1.

3.7.1 Utility Locations

Provide a third party, independent, private utility locating company to positively identify underground utilities in the work area in addition to any station locating service and coordinated with the station utility department.

3.7.2 Utility Location Verification

Physically verify underground utility locations, including utility depth, by hand digging using wood or fiberglass handled tools when any adjacent construction work is expected to come within 3 feet of the underground system.

3.7.3 Utilities Within and Under Concrete, Bituminous Asphalt, and Other Impervious Surfaces

Utilities located within and under concrete slabs or pier structures, bridges, parking areas, and the like, are extremely difficult to identify. Whenever contract work involves chipping, saw cutting, or core drilling through concrete, bituminous asphalt or other impervious surfaces, the existing utility location must be coordinated with station utility departments in addition to location and depth verification by a third party, independent, private locating company. The third party, independent, private locating company must locate utility depth by use of Ground Penetrating Radar (GPR), X-ray, bore scope, or ultrasound prior to the start of demolition and construction. Outages to isolate utility systems must be used in circumstances where utilities are unable to be positively identified. The use of historical drawings does not alleviate the Contractor from meeting this requirement.

3.8 ELECTRICAL

Perform electrical work in accordance with EM 385-1-1, Appendix A, Sections 11 and 12.

3.8.1 Conduct of Electrical Work

As delineated in EM 385-1-1, electrical work is to be conducted in a de-energized state unless there is no alternative method for accomplishing the work. In those cases obtain an energized work permit from the Contracting Officer. The energized work permit application must be accompanied by the AHA and a summary of why the equipment/circuit needs to be worked energized. Underground electrical spaces must be certified safe for entry before entering to conduct work. Cables that will be cut must be positively identified and de-energized prior to performing each cut. Attach temporary grounds in accordance with ASTM F855 and IEEE 1048. Perform all high voltage cable cutting remotely using hydraulic cutting tool. When racking in or live switching of circuit breakers, no additional person other than the switch operator is allowed in the space during the actual operation. Plan so that work near energized parts is minimized to the fullest extent possible. Use of electrical outages clear of any energized electrical sources is the preferred method.

When working in energized substations, only qualified electrical workers are permitted to enter. When work requires work near energized circuits as defined by NFPA 70, high voltage personnel must use personal protective equipment that includes, as a minimum, electrical hard hat, safety shoes, insulating gloves and electrical arc flash protection for personnel as required by NFPA 70E. Insulating blankets, hearing protection, and switching suits may also be required, depending on the specific job and as delineated in the Contractor's AHA. Ensure that each employee is familiar with and complies with these procedures and 29 CFR 1910.147.

3.8.2 Qualifications

Electrical work must be performed by QP personnel with verifiable credentials who are familiar with applicable code requirements. Verifiable credentials consist of State, National and Local Certifications or Licenses that a Master or Journeyman Electrician may hold, depending on work being performed, and must be identified in the appropriate AHA. Journeyman/Apprentice ratio must be in accordance with State, Local and Host Nation requirements applicable to where work is being performed.

3.8.3 Arc Flash

Conduct a hazard analysis/arc flash hazard analysis whenever work on or near energized parts greater than 50 volts is necessary, in accordance with NFPA 70E.

All personnel entering the identified arc flash protection boundary must be QPs and properly trained in NFPA 70E requirements and procedures. Unless permitted by NFPA 70E, no Unqualified Person is permitted to approach nearer than the Limited Approach Boundary of energized conductors and circuit parts. Training must be administered by an electrically qualified source and documented.

3.8.4 Grounding

Ground electrical circuits, equipment and enclosures in accordance with NFPA 70 and IEEE C2 to provide a permanent, continuous and effective path to ground unless otherwise noted by EM 385-1-1.

Check grounding circuits to ensure that the circuit between the ground and a grounded power conductor has a resistance low enough to permit sufficient current flow to allow the fuse or circuit breaker to interrupt the current.

3.8.5 Testing

Temporary electrical distribution systems and devices must be inspected, tested and found acceptable for Ground-Fault Circuit Interrupter (GFCI) protection, polarity, ground continuity, and ground resistance before initial use, before use after modification and at least monthly. Monthly inspections and tests must be maintained for each temporary electrical distribution system, and signed by the electrical CP or QP.

-- End of Section --

SECTION 01 42 00

SOURCES FOR REFERENCE PUBLICATIONS
11/14

PART 1 GENERAL

1.1 REFERENCES

Various publications are referenced in other sections of the specifications to establish requirements for the work. These references are identified in each section by document number, date and title. The document number used in the citation is the number assigned by the standards producing organization (e.g. ASTM B564 Standard Specification for Nickel Alloy Forgings). However, when the standards producing organization has not assigned a number to a document, an identifying number has been assigned for reference purposes.

1.2 ORDERING INFORMATION

The addresses of the standards publishing organizations whose documents are referenced in other sections of these specifications are listed below, and if the source of the publications is different from the address of the sponsoring organization, that information is also provided.

AACE INTERNATIONAL (AACE)
1265 Suncrest Towne Centre Drive
Morgantown, WV 26505-1876 USA
Ph: 304-296-8444
Fax: 304-291-5728
E-mail: info@aacei.org
Internet: http://www.aacei.org

AMERICAN SOCIETY OF SAFETY ENGINEERS (ASSE/SAFE)
1800 East Oakton Street
Des Plaines, IL 60018
Ph: 847-699-2929
Internet: http://www.asse.org

ASME INTERNATIONAL (ASME)
Two Park Avenue, M/S 10E
New York, NY 10016-5990
Ph: 800-843-2763
Fax: 973-882-1717
E-mail: customercare@asme.org
Internet: http://www.asme.org

ASTM INTERNATIONAL (ASTM)
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken, PA 19428-2959
Ph: 877-909-2786
Internet: http://www.astm.org

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)
445 and 501 Hoes Lane
Piscataway, NJ 08854-4141
Ph: 732-981-0060 or 800-701-4333

Fax: 732-562-9667
E-mail: onlinesupport@ieee.org
Internet: http://www.ieee.org

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
1 Batterymarch Park
Quincy, MA 02169-7471
Ph: 617-770-3000
Fax: 617-770-0700
Internet: http://www.nfpa.org

U.S. ARMY CORPS OF ENGINEERS (USACE)
CRD-C DOCUMENTS available on Internet:
http://www.wbdg.org/ccb/browse_cat.php?c=68
Order Other Documents from:
USACE Publications Depot
Attn: CEHEC-IM-PD
2803 52nd Avenue
Hyattsville, MD 20781-1102
Ph: 301-394-0081
Fax: 301-394-0084
E-mail: pubs-army@usace.army.mil
Internet: http://www.publications.usace.army.mil/
or
http://www.hnc.usace.army.mil/Missions/Engineering/TECHINFO.aspx

U. S. GREEN BUILDING COUNCIL (USGBC)
2101 L St NW, Suite 500
Washington, D.C. 20037
Ph: 800-795-1747
Internet: http://www.usgbc.org

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)
8601 Adelphi Road
College Park, MD 20740-6001
Ph: 866-272-6272
Fax: 301-837-0483
Internet: http://www.archives.gov
Order documents from:
Superintendent of Documents
U.S.Government Printing Office (GPO)
710 North Capitol Street, NW
Washington, DC 20401
Ph: 202-512-1800
Fax: 202-512-2104
E-mail: contactcenter@gpo.gov
Internet: http://www.gpoaccess.gov

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

-- End of Section --

SECTION 01 45 00.00 10

QUALITY CONTROL
02/10

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM D3740	(2012a) Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
ASTM E329	(2014a) Standard Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction

U.S. ARMY CORPS OF ENGINEERS (USACE)

ER 1110-1-12	(2006; Change 1) Engineering and Design -- Quality Management

1.2 PAYMENT

Separate payment will not be made for providing and maintaining an effective Quality Control program. Include all associated costs in the applicable Bid Schedule item.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Contractor Quality Control (CQC) Plan; G

Additional Requirements for Design Quality Control (DQC) Plan; G

SD-05 Design Data

Discipline-Specific Checklists

SD-06 Test Reports

Verification Statement

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

Establish and maintain an effective quality control (QC) system that complies with the Contract Clause titled "Inspection of Construction." QC consist of plans, procedures, and organization necessary to produce an end product which complies with the contract requirements. The QC system covers all design and construction operations, both onsite and offsite, and be keyed to the proposed design and construction sequence. The project superintendent will be held responsible for the quality of work and is subject to removal by the Contracting Officer for non-compliance with the quality requirements specified in the contract. In this context the highest level manager responsible for the overall construction activities at the site, including quality and production is the project superintendent. The project superintendent maintains a physical presence at the site at all times and is responsible for all construction and related activities at the site, except as otherwise acceptable to the Contracting Officer.

3.2 CONTRACTOR QUALITY CONTROL (CQC) PLAN

Submit no later than 15 days after receipt of notice to proceed, the Contractor Quality Control (CQC) Plan proposed to implement the requirements of the Contract Clause titled "Inspection of Construction." The Government will consider an interim plan for the first 30 days of operation. Design and construction will be permitted to begin only after acceptance of the CQC Plan or acceptance of an interim plan applicable to the particular feature of work to be started. Work outside of the accepted interim plan will not be permitted to begin until acceptance of a CQC Plan or another interim plan containing the additional work.

3.2.1 Content of the CQC Plan

Include, as a minimum, the following to cover all design and construction operations, both onsite and offsite, including subcontractors designers of record, consultants, architect/engineers (AE), fabricators, suppliers and purchasing agents:

a. A description of the quality control organization, including a chart showing lines of authority and acknowledgment that the CQC staff will implement the three phase control system for all aspects of the work specified. Include a CQC System Manager that reports to the project superintendent.

b. The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a CQC function.

c. A copy of the letter to the CQC System Manager signed by an authorized official of the firm which describes the responsibilities and delegates sufficient authorities to adequately perform the functions of the CQC System Manager, including authority to stop work which is not in

compliance with the contract. Letters of direction to all other various quality control representatives outlining duties, authorities, and responsibilities will be issued by the CQC System Manager. Furnish copies of these letters to the Contracting Officer.

d. Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, designers of record, consultants, architect engineers (AE), offsite fabricators, suppliers, and purchasing agents, . These procedures must be in accordance with Section 01 33 00 SUBMITTAL PROCEDURES.

e. Control, verification, and acceptance testing procedures for each specific test to include the test name, specification paragraph requiring test, feature of work to be tested, test frequency, and person responsible for each test. (Laboratory facilities approved by the Contracting Officer are required to be used.)

f. Procedures for tracking preparatory, initial, and follow-up control phases and control, verification, and acceptance tests including documentation.

g. Procedures for tracking design and construction deficiencies from identification through acceptable corrective action. Establish verification procedures that identified deficiencies have been corrected.

h. Reporting procedures, including proposed reporting formats.

i. A list of the definable features of work. A definable feature of work is a task which is separate and distinct from other tasks, has separate control requirements, and is identified by different trades or disciplines, or it is work by the same trade in a different environment. Although each section of the specifications can generally be considered as a definable feature of work, there are frequently more than one definable features under a particular section. This list will be agreed upon during the coordination meeting.

j. Coordinate scheduled work with Special Inspections required by Section 01 45 35 SPECIAL INSPECTIONS, the Statement of Special Inspections and the Schedule of Special Inspections. Where the applicable Code issue by the Internation Code Council (ICC) calls for inspections by the Building Official, the Contractor will include the inspections in the Contractor Quality Control Plan and will perform the inspections required by the applicable ICC. The Contractor will perform these inspections using independent qualified inspectors. Include the Special Inspection Plan requirements in the CQC Plan.

3.2.2 Additional Requirements for Design Quality Control (DQC) Plan

The following additional requirements apply to the Design Quality Control (DQC) plan:

a. Submit and maintain a Design Quality Control (DQC) Plan as an effective quality control program which assures that all services required by this contract are performed and provided in a manner that meets professional architectural and engineering quality standards. As a minimum, all documents must be technically reviewed by competent, independent reviewers identified in the DQC Plan. The same element that produced the product may not perform the independent technical

review (ITR). Correct errors and deficiencies in the design documents prior to submitting them to the Government.

b. Include the design schedule in the master project schedule, showing the sequence of events involved in carrying out the project design tasks within the specific contract period. This should be at a detailed level of scheduling sufficient to identify all major design tasks, including those that control the flow of work. Include review and correction periods associated with each item. This should be a forward planning as well as a project monitoring tool. The schedule reflects calendar days and not dates for each activity. If the schedule is changed, submit a revised schedule reflecting the change within 7 calendar days. Include in the DQC Plan the discipline-specific checklists to be used during the design and quality control of each submittal. Submit at each design phase as part of the project documentation these completed discipline-specific checklists. ER 1110-1-12 provides some useful information in developing checklists.

c. Implement the DQC Plan by a Design Quality Control Manager who has the responsibility of being cognizant of and assuring that all documents on the project have been coordinated. This individual must be a person who has verifiable engineering or architectural design experience and is a registered professional engineer or architect. Notify the Contracting Officer, in writing, of the name of the individual, and the name of an alternate person assigned to the position.

The Contracting Officer will notify the Contractor in writing of the acceptance of the DQC Plan. After acceptance, any changes proposed by the Contractor are subject to the acceptance of the Contracting Officer.

3.2.3 Acceptance of Plan

Acceptance of the Contractor's plan is required prior to the start of cons design and construction. Acceptance is conditional and will be predicated on satisfactory performance during the design andconstruction. The Government reserves the right to require the Contractor to make changes in the Constractor Quality Control(CQC) Plan and operations including removal of personnel, as necessary, to obtain the quality specified.

3.2.4 Notification of Changes

After acceptance of the CQC Plan, notify the Contracting Officer in writing of any proposed change. Proposed changes are subject to acceptance by the Contracting Officer.

3.3 COORDINATION MEETING

After the Postaward Conference, before start of design or construction, and prior to acceptance by the Government of the CQC Plan, meet with the Contracting Officer and discuss the Contractor's quality control system. Submit the CQC Plan a minimum of 5 calendar days prior to the Coordination Meeting. During the meeting, a mutual understanding of the system details must be developed, including the forms for recording the CQC operations, design activities, control activities, testing, administration of the system for both onsite and offsite work, and the interrelationship of Contractor's Management and control with the Government's Quality Assurance. Minutes of the meeting will be prepared by the Government, signed by both the Contractor and the Contracting Officer and will become a part of the contract file. There can be occasions when subsequent

conferences will be called by either party to reconfirm mutual understandings and/or address deficiencies in the CQC system or procedures which can require corrective action by the Contractor.

3.4 QUALITY CONTROL ORGANIZATION

3.4.1 Personnel Requirements

The requirements for the CQC organization are a Safety and Health Manager, , CQC System Manager, a Design Quality Manager, and sufficient number of additional qualified personnel to ensure safety and contract compliance. The Safety and Health Manager reports directly to a senior project (or corporate) official independent from the CQC System Manager. The Safety and Health Manager will also serve as a member of the CQC Staff Personnel identified in the technical provisions as requiring specialized skills to assure the required work is being performed properly will also be included as part of the CQC organization. The Contractor's CQC staff maintains a presence at the site at all times during progress of the work and have complete authority and responsibility to take any action necessary to ensure contract compliance. The CQC staff will be subject to acceptance by the Contracting Officer. Provide adequate office space, filing systems and other resources as necessary to maintain an effective and fully functional CQC organization. Promptly complete and furnish all letters, material submittals, shop drawing submittals, schedules and all other project documentation to the CQC organization. The CQC organization is responsible to maintain these documents and records at the site at all times, except as otherwise acceptable to the Contracting Officer.

3.4.2 CQC System Manager

Identify as CQC System Manager an individual within the onsite work organization that is responsible for overall management of CQC and has the authority to act in all CQC matters for the Contractor. The CQC System Manager is required to be a graduate engineer, graduate architect, or a graduate of construction management, with a minimum of 10 years construction experience on construction similar to this contract. This CQC System Manager is on the site at all times during construction and is employed by the prime Contractor. The CQC System Manager is assigned no other duties. Identify in the plan an alternate to serve in the event of the CQC System Manager's absence. The requirements for the alternate are the same as the CQC System Manager.

3.4.3 CQC Personnel

In addition to CQC personnel specified elsewhere in the contract, provide as part of the CQC organization specialized personnel to assist the CQC System Manager for the following areas: electrical, mechanical, civil, structural, environmental, architectural, submittals clerk, Cx Agent/LEED Specialist, Building Envelope. These individuals or specialized technical companies are directly employed by the prime Contractor and can not be employed by a supplier or subcontractor on this project; be responsible to the CQC System Manager; be physically present at the construction site during work on the specialized peronnel's areas of responsibility; have the necessary education and/or experience in accordance with the experience matrix listed herein. These individuals can perform other duties but need to be allowed sufficient time to perform their assigned quality control duties as described in the Quality Control Plan. A single person can cover more than one area provided that the single person is qualified to perform quality control activities in each designated and that workload allows.

All QC staff must also show training in medical type facilities, such as American Society of Healthcare Engineering (ASHE).

Experience Matrix	
Area	Qualifications
Civil	Graduate Civil Engineer or Construction Manager with 5 years experience in the type of work being performed on this project or technician with 10 yrs related experience
Mechanical	Graduate Mechanical Engineer with 5 yrs experience or person with 10 years of experience supervising mechanical features of work in the field with a construction company
Electrical	Graduate Electrical Engineer with 5 years related experience or person 10 years of experience supervising electrical features of work in the field with a construction company
Structural	Graduate Civil Engineer (with Structural Track or Focus) or Construction Manager with 5 years experience or person 10 years of experience supervising structural features of work in the field with a construction company
Architectural	Graduate Architect with 5 years experience or person with 10 years related experience
Environmental	Graduate Environmental Engineer with 5 years experience
Submittals	Submittal Clerk with 1 year experience
Building Envelope	Graduate Engineer or Architect with 5 years experience or person with 10 years related experience
Testing, Adjusting and Balancing (TAB) Personnel	Specialist must be a member of AABC or an experienced technician of the firm certified by the NEBB

Experience Matrix	
Area	Qualifications
Design Quality Control Manager	Registered Architect or Professional Engineer

3.4.4 Additional Requirement

In addition to the above experience and education requirements, the Contractor Quality Control(CQC) System Manager and Alternate CQC System Managerare required to have completed the Construction Quality Management (CQM) for Contractors course. If the CQC System Manager does not have a current certification, obtain the CQM for Contractors course certification within 90 days of award. This course is periodically offered by the Naval Facilities Engineering Command and the Army Corps of Engineers. Contact the Contracting Officer's Representative for information on the next scheduled class.

The Construction Quality Management Training certificate expires after 5 years. If the CQC System Manager's certificate has expired, retake the course to remain current.

3.4.5 Organizational Changes

Maintain the CQC staff at full strength at all times. When it is necessary to make changes to the CQC staff, revise the CQC Plan to reflect the changes and submit the changes to the Contracting Officer for acceptance.

3.5 SUBMITTALS AND DELIVERABLES

Submittals, if needed, have to comply with the requirements in Section 01 33 00SUBMITTAL PROCEDURES. The CQC organization is responsible for certifying that all submittals and deliverables are in compliance with the contract requirements. When Section 01 91 00.15 TOTAL BUILDING COMMISSIONING are included in the contract, the submittals required by those sections have to be coordinated with Section 01 33 00 SUBMITTAL PROCEDURES to ensure adequate time is allowed for each type of submittal required.

3.6 CONTROL

Contractor Quality Control (CQC)is the means by which the Contractor ensures that the construction, to include that of subcontractors and suppliers, complies with the requirements of the contract. At least three phases of control are required to be conducted by the CQC System Manager for each definable feature of the construction work as follows:

3.6.1 Preparatory Phase

This phase is performed prior to beginning work on each definable feature of work, after all required plans/documents/materials are approved/accepted, and after copies are at the work site. This phase includes:

a. A review of each paragraph of applicable specifications, reference codes, and standards. Make available during the preparatory inspection a copy of those sections of referenced codes and standards applicable to that portion of the work to be accomplished in the field. Maintain

and make available in the field for use by Government personnel until final acceptance of the work.

b. Review of the contract drawings.

c. Check to assure that all materials and/or equipment have been tested, submitted, and approved.

d. Review of provisions that have been made to provide required control inspection and testing.

e. Review Special Inspections required by Section 01 45 35 SPECIAL INSPECTIONS, the Statement of Special Inspections and the Schedule of Special Inspections.

f. Examination of the work area to assure that all required preliminary work has been completed and is in compliance with the contract.

g. Examination of required materials, equipment, and sample work to assure that they are on hand, conform to approved shop drawings or submitted data, and are properly stored.

h. Review of the appropriate activity hazard analysis to assure safety requirements are met.

i. Discussion of procedures for controlling quality of the work including repetitive deficiencies. Document construction tolerances and workmanship standards for that feature of work.

j. Check to ensure that the portion of the plan for the work to be performed has been accepted by the Contracting Officer.

k. Discussion of the initial control phase.

l. The Government need to be notified at least 24 hours in advance of beginning the preparatory control phase. Include a meeting conducted by the CQC System Manager and attended by the superintendent, other CQC personnel (as applicable), and the foreman responsible for the definable feature. Document the results of the preparatory phase actions by separate minutes prepared by the CQC System Manager and attach to the daily CQC report. Instruct applicable workers as to the acceptable level of workmanship required in order to meet contract specifications.

3.6.2 Initial Phase

This phase is accomplished at the beginning of a definable feature of work. Accomplish the following:

a. Check work to ensure that it is in full compliance with contract requirements. Review minutes of the preparatory meeting.

b. Verify adequacy of controls to ensure full contract compliance. Verify required control inspection and testing are in conpliance with the contract.

c. Establish level of workmanship and verify that it meets minimum acceptable workmanship standards. Compare with required sample panels as appropriate.

d. Resolve all differences.

e. Check safety to include compliance with and upgrading of the safety plan and activity hazard analysis. Review the activity analysis with each worker.

f. The Government need to be notified at least 24 hours in advance of beginning the initial phase for definable feature of work. Prepare separate minutes of this phase by the CQC System Manager and attach to the daily CQC report. Indicate the exact location of initial phase for definable feature of work for future reference and comparison with follow-up phases.

g. The initial phase for each definable feature of work is repeated for each new crew to work onsite, or any time acceptable specified quality standards are not being met.

h. Coordinate scheduled work with Special Inspections required by Section 01 45 35 SPECIAL INSPECTIONS, the Statement of Special Inspections and the Schedule of Special Inspections.

3.6.3 Follow-up Phase

Perform daily checks to assure control activities, including control testing, are providing continued compliance with contract requirements, until completion of the particular feature of work. Record the checks in the CQC documentation. Conduct final follow-up checks and correct all deficiencies prior to the start of additional features of work which may be affected by the deficient work. Do not build upon nor conceal non-conforming work. Coordinate scheduled work with Special Inspections required by Section 01 45 35 SPECIAL INSPECTIONS, the Statement of Special Inspections and the Schedule of Special Inspections.

3.6.4 Additional Preparatory and Initial Phases

Conduct additional preparatory and initial phases on the same definable features of work if: the quality of on-going work is unacceptable; if there are changes in the applicable CQC staff, onsite production supervision or work crew; if work on a definable feature is resumed after a substantial period of inactivity; or if other problems develop.

3.7 TESTS

3.7.1 Testing Procedure

Perform specified or required tests to verify that control measures are adequate to provide a product which conforms to contract requirements. Upon request, furnish to the Government duplicate samples of test specimens for possible testing by the Government. Testing includes operation and/or acceptance tests when specified. Procure the services of a Corps of Engineers approved testing laboratory or establish an approved testing laboratory at the project site. Perform the following activities and record and provide the following data:

a. Verify that testing procedures comply with contract requirements.

b. Verify that facilities and testing equipment are available and comply with testing standards.

c. Check test instrument calibration data against certified standards.

d. Verify that recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.

e. Record results of all tests taken, both passing and failing on the CQC report for the date taken. Specification paragraph reference, location where tests were taken, and the sequential control number identifying the test. If approved by the Contracting Officer, actual test reports are submitted later with a reference to the test number and date taken. Provide an information copy of tests performed by an offsite or commercial test facility directly to the Contracting Officer. Failure to submit timely test reports as stated results in nonpayment for related work performed and disapproval of the test facility for this contract.

3.7.2 Testing Laboratories

All testing laboratories must be validated by the USACE Material Testing Center (MTC) for the tests to be performed. Information on the USACE MTC with web-links to both a list of validated testing laboratories and for the laboratory inspection request for can be found at: http://www.erdc.usace.army.mil/Media/Fact-Sheets/Fact-Sheet-Article-View/Article/476661/t

3.7.2.1 Capability Check

The Government reserves the right to check laboratory equipment in the proposed laboratory for compliance with the standards set forth in the contract specifications and to check the laboratory technician's testing procedures and techniques. Laboratories utilized for testing soils, concrete, asphalt, and steel is required to meet criteria detailed in ASTM D3740 and ASTM E329.

3.7.2.2 Capability Recheck

If the selected laboratory fails the capability check, the Contractor will be assessed a charge determined by the Contracting Officer's Representative to reimburse the Government for each succeeding recheck of the laboratory or the checking of a subsequently selected laboratory. Such costs will be deducted from the contract amount due the Contractor.

3.7.3 Onsite Laboratory

The Government reserves the right to utilize the Contractor's control testing laboratory and equipment to make assurance tests, and to check the Contractor's testing procedures, techniques, and test results at no additional cost to the Government.

3.8 COMPLETION INSPECTION

3.8.1 Punch-Out Inspection

Conduct an inspection of the work by the CQC System Manager near the end of the work, or any increment of the work established by a time stated in the SPECIAL CONTRACT REQUIREMENTS Clause, "Commencement, Prosecution, and Completion of Work", or by the specifications. Prepare and include in the CQC documentation a punch list of items which do not conform to the

approved drawings and specifications, as required by paragraph DOCUMENTATION. Include within the list of deficiencies the estimated date by which the deficiencies will be corrected. Make a second inspection the CQC System Manager or staff to ascertain that all deficiencies have been corrected. Once this is accomplished, notify the Government that the facility is ready for the Government Pre-Final inspection.

3.8.2 Pre-Final Inspection

The Government will perform the pre-final inspection to verify that the facility is complete and ready to be occupied. A Government Pre-Final Punch List may be developed as a result of this inspection. Ensure that all items on this list have been corrected before notifying the Government, so that a Final inspection with the customer can be scheduled. Correct any items noted on the Pre-Final inspection in a timely manner. These inspections and any deficiency corrections required by this paragraph need to be accomplished within the time slated for completion of the entire work or any particular increment of the work if the project is divided into increments by separate completion dates.

3.8.3 Final Acceptance Inspection

The Contractor's Quality Control Inspection personnel, plus the superintendent or other primary management person, and the Contracting Officer's Representativeis required to be in attendance at the final acceptance inspection. Additional Government personnel including, but not limited to, those from Base/Post Civil Facility Engineer user groups, and major commands can also be in attendance. The final acceptance inspection will be formally scheduled by the Contracting Officer based upon results of the Pre-Final inspection. Notify the Contracting Officer at least 14 days prior to the final acceptance inspection and include the Contractor's assurance that all specific items previously identified to the Contractor as being unacceptable, along with all remaining work performed under the contract, will be complete and acceptable by the date scheduled for the final acceptance inspection. Failure of the Contractor to have all contract work acceptably complete for this inspection will be cause for the Contracting Officer to bill the Contractor for the Government's additional inspection cost in accordance with the contract clause titled "Inspection of Construction".

3.9 DOCUMENTATION

Maintain current records providing factual evidence that required quality control activities and/or tests have been performed. Include in these records the work of subcontractors and suppliers on an acceptable form that includes, as a minimum, the following information:

a. The name and area of responsibility of the Contractor/Subcontractor.

b. Operating plant/equipment with hours worked, idle, or down for repair.

c. Work performed each day, giving location, description, and by whom. When Network Analysis (NAS) is used, identify each phase of work performed each day by NAS activity number.

d. Test and/or control activities performed with results and references to specifications/drawings requirements. Identify the control phase (Preparatory, Initial, Follow-up). List of deficiencies noted, along with corrective action.

e. Quantity of materials received at the site with statement as to acceptability, storage, and reference to specifications/drawings requirements.

f. Submittals and deliverables reviewed, with contract reference, by whom, and action taken.

g. Offsite surveillance activities, including actions taken.

h. Job safety evaluations stating what was checked, results, and instructions or corrective actions.

i. Instructions given/received and conflicts in plans and/or specifications.

j. Provide documentation of design quality control activities. For independent design reviews, provide, as a minimum, identification of the Independent Technical Review (ITR) team, the ITR review comments, responses and the record of resolution of the comments.

k. Verification Statement.

Indicate a description of trades working on the project; the number of personnel working; weather conditions encountered; and any delays encountered. Cover both conforming and deficient features and include a statement that equipment and materials incorporated in the work and workmanship comply with the contract. Furnish the original and one copy of these records in report form to the Government daily within 24 hours after the date covered by the report, except that reports need not be submitted for days on which no work is performed. As a minimum, prepare and submit one report for every 7 days of no work and on the last day of a no work period. All calendar days need to be accounted for throughout the life of the contract. The first report following a day of no work will be for that day only. Reports need to be signed and dated by the Contractor Quality Control(CQC) System Manager. Include copies of test reports and copies of reports prepared by all subordinate quality control personnel within the CQC System Manager Report.

3.10 SAMPLE FORMS

Sample forms enclosed at the end of this section.

3.11 NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the foregoing requirements. Take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, will be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Contracting Officer can issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders will be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

-- End of Section --

SECTION 01 45 00.10 10

QUALITY CONTROL SYSTEM (QCS)
02/10

PART 1 GENERAL

1.1 Contract Administration

The Government will use the Resident Management System (RMS) to assist in its monitoring and administration of this contract. The Contractor uses the Government-furnished Construction Contractor Module of RMS, referred to as Quality Control System(QCS), to record, maintain, and submit various information throughout the contract period. The Contractor module, user manuals, updates, and training information can be downloaded from the RMS web site (http://rms.usace.army.mil). The joint Government-Contractor use of RMS and QCS facilitates electronic exchange of information and overall management of the contract. QCS provides the means for the Contractor to input, track, and electronically share information with the Government in the following areas:

Administration
Finances
Quality Control
Submittal Monitoring
Scheduling
Import/Export of Data

1.1.1 Correspondence and Electronic Communications

For ease and speed of communications, exchange correspondence and other documents in electronic format to the maximum extent feasible between the Government and Contractor. Correspondence, pay requests and other documents comprising the official contract record are also be provided in paper format, with signatures and dates where necessary. Paper documents will govern, in the event of discrepancy with the electronic version.

1.1.2 Other Factors

Particular attention is directed to Contract Clause, "Schedules for Construction Contracts", Contract Clause, "Payments", Section 01 32 01.00 10 PROJECT SCHEDULE, Section 01 33 00 SUBMITTAL PROCEDURES, and Section 01 45 00.00 10 QUALITY CONTROL, which have a direct relationship to the reporting to be accomplished through QCS. Also, there is no separate payment for establishing and maintaining the QCS database; costs associated will be included in the contract pricing for the work.

1.2 QCS SOFTWARE

QCS is a Windows-based program that can be run on a stand-alone personal computer or on a network. The Government will make available the QCS software to the Contractor after award of the construction contract. Prior to the Pre-Construction Conference, the Contractor will be responsible to download, install and use the latest version of the QCS software from the Government's RMS Internet Website. Upon specific justification and request by the Contractor, the Government can provide QCS on optical disc. Any program updates of QCS will be made available to the Contractor via the

Government RMS Website as the updates become available.

1.2.1 QCS TRANSITION TO RMS CONTRACTOR'S MODE (CM)

QCS will transition to RMS Contractor's Mode (CM), which will provide additional capabilities. The database will remain the same. References to QCS will change to RMS CM during the contract period. Equipment and software requirements will not change other than the requirement to download the new RMS CM upon availability.

1.3 SYSTEM REQUIREMENTS

The following is the minimum system configuration required to run QCS and allow for transition to upgrade to RMS 3.0 Contractor Mode::

Minimum QCS System Requirements	
Hardware	
Windows-based PC	1.5 GHz 2 core or higher processor
RAM	8 GB
Hard drive disk	200 GB space for sole use by the QCS system
Optical Disc (CD or DVD) Reader	8x speed or higher
Monitor	SVGA or higher resolution (1024x768, 256 colors)
Mouse or other pointing device	
Windows compatible printer	Laser printer must have 4 MB+ of RAM
Connection to the Internet	minimum 56k BPS
Software	
MS Windows	Windows 7 or Windows 10
Word Processing software	MS Word 2000 or newer
Internet browser	Netscape Navigator, Microsoft Internet Explorer, or other browser that supports HTML 4.0 or higher
Email	MAPI compatible
Virus protection software	regularly upgraded with all issued manufacturer's updates

1.4 RELATED INFORMATION

1.4.1 QCS User Guide

After contract award, download instructions for the installation and use of

QCS from the Government RMS Internet Website. In case of justifiable difficulties, the Government will provide an optical disc (CD/DVD) containing these instructions.

1.4.2 Contractor Quality Control (CQC) Training

The use of QCS will be discussed with the Quality Control(QC) System Manager during the mandatory CQC Training class.

1.5 CONTRACT DATABASE

Prior to the pre-construction conference, the Government will provide the Contractor with basic contract award data to use for QCS. The Government will provide data updates to the Contractor as needed. These updates will generally consist of submittal reviews, correspondence status, Quality Assurance(QA) comments, and other administrative and QA data.

1.6 DATABASE MAINTENANCE

Establish, maintain, and update data in the QCS database throughout the duration of the contract at the Contractor's site office. Submit data updates to the Government (e.g., daily reports, submittals, RFI's, schedule updates, payment requests) using the Government's SSH File Transfer Protocol (SFTP) repository built into QCS export function. If permitted by the Contracting Officer, email or optical disc may be used instead of QCS (see Paragraph DATA SUBMISSION VIA OPTICAL DISC). The QCS database typically includes current data on the following items:

1.6.1 Administration

1.6.1.1 Contractor Information

Contain within the database the Contractor's name, address, telephone numbers, management staff, and other required items. Within 14 calendar days of receipt of QCS software from the Government, deliver Contractor administrative data in electronic format.

1.6.1.2 Subcontractor Information

Contain within the database the name, trade, address, phone numbers, and other required information for all subcontractors. A subcontractor is listed separately for each trade to be performed. Assign each subcontractor/trade a unique Responsibility Code, provided in QCS. Within 14 calendar days of receipt of QCS software from the Government, deliver subcontractor administrative data in electronic format.

1.6.1.3 Correspondence

Identify all Contractor correspondence to the Government with a serial number. Prefix correspondence initiated by the Contractor's site office with "S". Prefix letters initiated by the Contractor's home (main) office with "H". Letters are numbered starting from 0001. (e.g., H-0001 or S-0001). The Government's letters to the Contractor will be prefixed with "C".

1.6.1.4 Equipment

Contain within the Contractor's QCS database a current list of equipment planned for use or being used on the jobsite, including the most recent and

planned equipment inspection dates.

1.6.1.5 Management Reporting

QCS includes a number of reports that Contractor management can use to track the status of the project. The value of these reports is reflective of the quality of the data input, and is maintained in the various sections of QCS. Among these reports are: Progress Payment Request worksheet, Quality Assurance/Quality Control (QA/QC) comments, Submittal Register Status, Three-Phase Control checklists.

1.6.1.6 Request For Information (RFI)

Exchange all Requests For Information (RFI) using the Built-in RFI generator and tracker in QCS.

1.6.2 Finances

1.6.2.1 Pay Activity Data

Include within the QCS database a list of pay activities that the Contractor develops in conjunction with the construction schedule. The sum of pay activities equals the total contract amount, including modifications. Group pay activities Contract Line Item Number (CLIN); the sum of the activities equals the amount of each CLIN. The sum of all CLINs equals the contract amount.

1.6.2.2 Payment Requests

Prepare all progress payment requests using Quality Control System (QCS). Complete the payment request worksheet, prompt payment certification, and payment invoice in QCS. Update the work completed under the contract, measured as percent or as specific quantities, at least monthly. After the update, generate a payment request report using QCS. Submit the payment request, prompt payment certification, and payment invoice with supporting data using the Government's SFTP repository built into QCS export function. If permitted by the Contracting Officer, email or a optical disc may be used. A signed paper copy of the approved payment request is also required and will govern in the event of discrepancy with the electronic version.

1.6.3 Quality Control (QC)

QCS provides a means to track implementation of the 3-phase QC Control System, prepare daily reports, identify and track deficiencies, document progress of work, and support other Contractor QC requirements. Maintain this data on a daily basis. Entered data will automatically output to the QCS generated daily report. Provide the Government a Contractor Quality Control (CQC) Plan within the time required in Section 01 45 00.00 10 QUALITY CONTROL. Within seven calendar days of Government acceptance, submit a QCS update reflecting the information contained in the accepted CQC Plan: schedule, pay activities, features of work, submittal register, QC requirements, and equipment list.

1.6.3.1 Daily Contractor Quality Control (CQC) Reports.

QCS includes the means to produce the Daily CQC Report. The Contractor may use other formats to record basic QC data. However, the Daily CQC Report generated by QCS must be the Contractor's official report. Summarize data

from any supplemental reports by the Contractor and consolidate onto the QCS-generated Daily CQC Report. Submit daily CQC Reports as required by Section 01 45 00.00 10 QUALITY CONTROL. Electronically submit reports to the Government within 24 hours after the date covered by the report. Also provide the Government a signed, printed copy of the daily CQC report.

1.6.3.2 Deficiency Tracking.

Use QCS to track deficiencies. Deficiencies identified by the Contractor will be numerically tracked using its Quality Control (QC) punch list items. Maintain a current log of its QC punch list items in the QCS database. The Government will log the deficiencies it has identified using its Quality Assurance (QA) punch list items. The Government's QA punch list items will be included in its export file to the Contractor. Regularly update the correction status of both QC and QA punch list items.

1.6.3.3 QC Requirements

Develop and maintain a complete list of QC testing and required structural and life safety special inspections required by the International Code Council (ICC), transferred and installed property, and user training requirements in QCS. Update data on these QC requirements as work progresses, and promptly provide the information to the Government via QCS.

1.6.3.4 Three-Phase Control Meetings

Maintain scheduled and actual dates and times of preparatory and initial control meetings in QCS.

1.6.3.5 Labor and Equipment Hours

Log labor and equipment exposure hours on a daily basis. The labor and equipment exposure data will be rolled up into a monthly exposure report.

1.6.3.6 Accident/Safety Reporting

The Government will issue safety comments, directions, or guidance whenever safety deficiencies are observed. The Government's safety comments will be included in its export file to the Contractor. Regularly update the correction status of the safety comments. In addition, utilize QCS to advise the Government of any accidents occurring on the jobsite. A brief supplemental entry of an accident is not to be considered as a substitute for completion of mandatory reports, e.g., ENG Form 3394 and OSHA Form 300.

1.6.3.7 Features of Work

Include a complete list of the features of work in the QCS database. A feature of work is associated with multiple pay activities. However, each pay activity (see subparagraph "Pay Activity Data" of paragraph "Finances") will only be linked to a single feature of work.

1.6.3.8 Hazard Analysis

Use QCS to develop a hazard analysis for each feature of work included in the CQC Plan. Address any hazards, or potential hazards, that are associated with the work.

1.6.4 Submittal Management

The Government will provide the initial submittal register in electronic format. Thereafter, maintain a complete list of submittals, including completion of data columns. Dates when submittals are received and returned by the Government will be included in its export file to the Contractor. Use QCS to track and transmit submittals. ENG Form 4025, submittal transmittal form, and the submittal register update is produced using QCS. QCS and RMS will be used to update, store and exchange submittal registers and transmittals, but will not be used for storage of actual submittals.

1.6.5 Schedule

Develop a construction schedule consisting of pay activities, in accordance with Section 01 32 01.00 10 PROJECT SCHEDULE. Input and maintain in the QCS database the schedule either manually or by using the Standard Data Exchange Format (SDEF) (see Section 01 32 01.00 10 PROJECT SCHEDULE). Include with each pay request the updated schedule. Provide electronic copies of transmittals.

1.6.6 Import/Export of Data

QCS includes the ability to export Contractor data to the Government and to import submittal register and other Government-provided data from RMS, and schedule data using SDEF.

1.7 IMPLEMENTATION

Contractor use of QCS as described in the preceding paragraphs is mandatory. Ensure that sufficient resources are available to maintain its QCS database, and to provide the Government with regular database updates. QCS is an integral part of the Contractor's management of quality control.

1.8 DATA SUBMISSION VIA OPTICAL DISC

The Government-preferred method for Contractor's submission of QCS data is by using the Government's SFTP repository built into QCS export function. Other data is submitted using email with file attachment(s). For locations where this is not feasible, the Contracting Officer may permit use of optical disc for data transfer. Export data onto optical discs using the QCS built-in export function. If used, submit optical discs in accordance with the following:

1.8.1 File Medium

Submit in English required data on optical disc conforming to industry standards used in the United States.

1.8.2 Optical Disc Labels

Affix a permanent exterior label to each optical disc submitted. Indicate on the label in English, the QCS file name, full contract number, contract name, project location, data date, name and telephone number of person responsible for the data.

1.8.3 File Names

The files will be automatically named by the QCS software. The naming

convention established by the QCS software is not to be altered.

1.9 MONTHLY COORDINATION MEETING

Update the QCS database each workday. At least monthly, generate and submit an export file to the Government with schedule update and progress payment request. As required in Contract Clause "Payments", at least one week prior to submittal, meet with the Government representative to review the planned progress payment data submission for errors and omissions.

Make required corrections prior to Government acceptance of the export file and progress payment request. Payment requests accompanied by incomplete or incorrect data submittals will be returned. The Government will not process progress payments until an acceptable QCS export file is received.

1.10 NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the requirements of this specification. Take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, will be deemed sufficient for the purpose of notification.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

SECTION 01 57 19.01 20

SUPPLEMENTAL TEMPORARY ENVIRONMENTAL CONTROLS
02/10

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only. If state or local references are not provided here, refer to Section 01 57 19.00 20 TEMPORARY ENVIRONMENTAL CONTROLS for appropriate references.

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are [for Contractor Quality Control approval.][for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government.] The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Excavation Permits; G

Dirt and Dust Control Plan; G

Storage Inventory Form; G

[SD-06 Test Reports

[___][; G]]

1.3 REQUIREMENTS

Remove and dispose of rubbish and debris from Government property.

(a.) Provide 24-hour advance written notice to the Contracting Office of Contractor's intention to dispose of off base.

(b.) Disposal at sites or landfills not holding a valid state of Florida permit is specifically prohibited. The prohibition also applies to sites where a permit my have been applied for but not yet obtained.

(c.) Off-site disposal of construction debris outside the parameters of this paragraph at site without State permits and/or not in accordance with regulatory requirements will require the Contractor at his own expense to remove, transport and relocate the debris to a State approved site. The Contractor will also be required to pay any fines, penalties, or fees related to the illegal disposal of construction debris.

The types of construction debris that may be disposed of at off-site landfills, following State of Florida protocals includes:

Mixed Debris	The following materials may be placed in the landfill in a location designated by the landfill operator. These items may be mixed together. Sheetrock - plaster - glass (broken) Non asbestos insulation - (fiberglass and mineral wool will be bagged). Packing paper, Styrofoam, and pasteboard boxes Non-asbestos roofing materials such as shingles built-up and shingle roofing. Painted wood such as doors, windows, siding, and trim. Plastic/fiberglass such as pipe, electrical boxes, cover plates, etc. Ceramic and vinyl flooring or tile - ceiling tile.
Masonry and Concrete	Deliver concrete, block, brick, mortar to the landfill separate from any other items, and place in a location designated by the landfill operator. Reinforcement wire and rebar will be removed flush with exposed surfaces.
Non-recyclable Cardboard	Breakdown corrugated cardboard boxes and deliver to the landfill.
Non-recyclable Wall	Deliver usable pallets to deliver to the landfill.
Treated Wood	Deliver treated wood, and such as piling and power poles, to the landfill separated from any other items, and place in locations as designated by the landfill operator.
Untreated/Unpainted Wood	Deliver lumber, trees, stumps, limbs, tops, and shrubs to the landfill separated from any other items, and place in locations as designated by landfill operator.
Organic Matter	Deliver leaves, pine straw, and grass clippings to the landfill separated from any other items, and place in locations as designated by landfill operator. No bags or containers are allowed.
Fiberglass Tanks - 550 Gallons or less	Clean tanks before deliver to landfill.
Asphalt Pavement	Remove pavement from Government property and deliver to an asphalt-recycling establishment. Provide a record of the total tons of asphalt recycled and the corporate name and location of the recycling establishment receiving the removed asphalt.

Weigh each and every Vehicle delivering debris	Separate each category of construction debris at construction site and deliver separately to the landfill.
Weigh each and every Vehicle delivering debris	Place each category of construction debris in the landfill at the location designated by the landfill operator.
Metals	Metals may only be accepted at the landfill in segregated areas. Remove metals from each and every category before delivery to the landfill. (Example: Remove hardware from doors and windows) Aluminum, brass, copper, lead, other metal, electrical wiring, cable (cut in 3 foot or less sections)
Asbestos	Refer to Section 01 10 10, Part 19.
Lead Based Paint and Materials	Refer to Section 01 10 10, Part 19.

1.3.4 SOUTHEAST

a. Dirt and Dust Control Plan: Submit truck and material haul routes along with a plan for controlling dirt, debris, and dust on base roadways. As a minimum, identify in the plan the subcontractor and equipment for cleaning along the haul route and measures to reduce dirt, dust, and debris from roadways.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

SECTION 01 74 19

CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT
01/07

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

U.S. GREEN BUILDING COUNCIL (USGBC)

LEED BD+C	(2009; R 2010) Leadership in Energy and Environmental Design(tm) Building Design and Construction (LEED-NC)
LEED GBDC Ref Guide	(2009; R 2010) LEED Reference Guide for Green Building Design, Construction and Major Renovations of Commercial and Institutional Buildings including Core & Shell and K-12 Projects

1.2 GOVERNMENT POLICY

Government policy is to apply sound environmental principles in the design, construction and use of facilities. As part of the implementation of that policy: (1) practice efficient waste management when sizing, cutting, and installing products and materials and (2) use all reasonable means to divert construction and demolition waste from landfills and incinerators and to facilitate their recycling or reuse. Divert a minimum of 60 percent by weight of total project solid waste from the landfill.

1.3 MANAGEMENT

Develop and implement a waste management program. Take a pro-active, responsible role in the management of construction and demolition waste and require all subcontractors, vendors, and suppliers to participate in the effort. Construction and demolition waste includes products of demolition or removal, excess or unusable construction materials, packaging materials for construction products, and other materials generated during the construction process but not incorporated into the work. In the management of waste, consider the availability of viable markets, the condition of the material, the ability to provide the material in suitable condition and in a quantity acceptable to available markets, and time constraints imposed by internal project completion mandates. Implement any special programs involving rebates or similar incentives related to recycling of waste. Revenues or other savings obtained for salvage, or recycling accrue to the Contractor. Appropriately permit firms and facilities used for recycling, reuse, and disposal for the intended use to the extent required by federal, state, and local regulations. Also, provide on-site instruction of appropriate separation, handling, recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the project.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Waste Management Plan; G; [(LEED BD+C)]

SD-11 Closeout Submittals

Records; [(LEED BD+C)]

1.5 MEETINGS

Conduct Construction Waste Management meetings. After award of the Contract and prior to commencement of work, schedule and conduct a meeting with the Contracting Officer to discuss the proposed Waste Management Plan and to develop a mutual understanding relative to the details of waste management. The requirements for this meeting may be fulfilled during the coordination and mutual understanding meeting outlined in Section 01 45 00.00 10 QUALITY CONTROL. At a minimum, discuss environmental and waste management goals and issues at the following additional meetings:

a. Pre-bid meeting.

b. Preconstruction meeting.

c. Regular QC meetings.

d. Work safety meetings.

1.6 WASTE MANAGEMENT PLAN

Submit a waste management plan within 15 days after notice to proceed and not less than 10 days before the preconstruction meeting. The plan demonstrates how to meet the the project waste diversion goal. Also, include the following in the plan:

a. Name of individuals on the Contractor's staff responsible for waste prevention and management.

b. Actions that will be taken to reduce solid waste generation, including coordination with subcontractors to ensure awareness and participation.

c. Description of the regular meetings to be held to address waste management.

d. Description of the specific approaches to be used in recycling/reuse of the various materials generated, including the areas on site and equipment to be used for processing, sorting, and temporary storage of wastes.

e. Characterization, including estimated types and quantities, of the

waste to be generated.

f. Name of landfill and/or incinerator to be used and the estimated costs for use, assuming that there would be no salvage or recycling on the project.

g. Identification of local and regional reuse programs, including non-profit organizations such as schools, local housing agencies, and organizations that accept used materials such as materials exchange networks and Habitat for Humanity. Include the name, location, and phone number for each reuse facility to be used, and provide a copy of the permit or license for each facility.

h. List of specific waste materials that will be salvaged for resale, salvaged and reused on the current project, salvaged and stored for reuse on a future project, or recycled. Identify the recycling facilities by name, location, and phone number, including a copy of the permit or license for each facility.

i. Identification of materials that cannot be recycled/reused with an explanation or justification, to be approved by the Contracting Officer.

j. Description of the means by which any waste materials identified in item (h) above will be protected from contamination.

k. Description of the means of transportation of the recyclable materials (whether materials will be site-separated and self-hauled to designated centers, or whether mixed materials will be collected by a waste hauler and removed from the site).

l. Anticipated net cost savings determined by subtracting Contractor program management costs and the cost of disposal from the revenue generated by sale of the materials and the incineration and/or landfill cost avoidance.

Revise and resubmit Plan as required by the Contracting Officer. Approval of Contractor's Plan will not relieve the Contractor of responsibility for compliance with applicable environmental regulations or meeting project cumulative waste diversion requirement. Distribute copies of the Waste Management Plan to each subcontractor, the Quality Control Manager, and the Contracting Officer.

1.7 RECORDS

Maintain records to document the quantity of waste generated; the quantity of waste diverted through sale, reuse, or recycling; and the quantity of waste disposed by landfill or incineration. [Keep records in accordance with the LEED GBDC Ref Guide and using the LEED BD+C Letter Template.] Make the records available to the Contracting Officer during construction, and [deliver to the Contracting Officer upon completion of the construction][include in the Sustainability Notebook] a copy of the records.

[Demolition accomplished by other parties on this project site count toward the project's total waste diversion [cumulative score for LEED BD+C and] for sustainability requirements. Information on the quantity and disposition of these materials will be provided by the Contracting Officer. Include this data in records, annotated to indicate that it was accomplished by another party.]

1.8 REPORTS

Provide quarterly reports and a final report to the Contracting Officer's Representative. Include project name, information for waste generated this quarter, and cumulative totals for the project in quarterly and final reports. Also include in each report, supporting documentation to include manifests, weight tickets, receipts, and invoices specifically identifying the project and waste material. Include timber harvest and demolition information, if any.

1.9 COLLECTION

Separate, store, protect, and handle at the site identified recyclable and salvageable waste products in a manner that maximizes recyclability and salvagability of identified materials. Provide the necessary containers, bins and storage areas to facilitate effective waste management and clearly and appropriately identify them. Provide materials for barriers and enclosures around recyclable material storage areas which are nonhazardous and recyclable or reusable. Locate out of the way of construction traffic. Provide adequate space for pick-up and delivery and convenience to subcontractors. Recycling and waste bin areas are to be kept neat and clean, and handle recyclable materials to prevent contamination of materials from incompatible products and materials. Clean contaminated materials prior to placing in collection containers. Use cleaning materials that are nonhazardous and biodegradable. Handle hazardous waste and hazardous materials in accordance with applicable regulations and coordinate with Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS. Separate materials by one of the following methods:

1.9.1 Source Separated Method.

Separate waste products and materials that are recyclable from trash and sorted as described below into appropriately marked separate containers and then transported to the respective recycling facility for further processing. Deliver materials in accordance with recycling or reuse facility requirements (e.g., free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process). Separate materials into the following category types as appropriate to the project waste and to the available recycling and reuse programs in the project area:

a. Land clearing debris.

b. Asphalt.

c. Concrete and masonry.

d. Metal (e.g. banding, stud trim, ductwork, piping, rebar, roofing, other trim, steel, iron, galvanized, stainless steel, aluminum, copper, zinc, lead brass, bronze).

(1) Ferrous.

(2) Non-ferrous.

e. Wood (nails and staples allowed).

f. Debris.

g. Glass (colored glass allowed).

h. Paper.

(1) Bond.

(2) Newsprint.

(3) Cardboard and paper packaging materials.

i. Plastic.

Type	
1	Polyethylene Terephthalate (PET, PETE)
2	High Density Polyethylene (HDPE)
3	Vinyl (Polyvinyl Chloride or PVC)
4	Low Density Polyethylene (LDPE)
5	Polypropylene (PP)
6	Polystyrene (PS)
7	Other. Use of this code indicates that the package in question is made with a resin other than the six listed above, or is made of more than one resin listed above, and used in a multi-layer combination.

j. Gypsum.

k. Non-hazardous paint and paint cans.

l. Carpet.

m. Ceiling tiles.

n. Insulation.

o. Beverage containers.

p. [_____].

1.9.2 Co-Mingled Method.

Place waste products and recyclable materials into a single container and then transport to a recycling facility where the recyclable materials are sorted and processed.

1.9.3 Other Methods.

Other proposed methods may be used when approved by the Contracting Officer.

1.10 DISPOSAL

Control accumulation of waste materials and trash. Recycle or dispose of collected materials off-site at intervals approved by the Contracting Officer and in compliance with waste management procedures. Except as otherwise specified in other sections of the specifications, dispose of in accordance with the following:

1.10.1 Reuse.

Give first consideration to salvage for reuse since little or no re-processing is necessary for this method, and less pollution is created when items are reused in their original form. Coordinate reuse with the Contracting Officer. Consider sale or donation of waste suitable for reuse.

1.10.2 Recycle.

Recycle waste materials not suitable for reuse, but having value as being recyclable. Recycle all fluorescent lamps, HID lamps, and mercury-containing thermostats removed from the site. Arrange for timely pickups from the site or deliveries to recycling facilities in order to prevent contamination of recyclable materials.

1.10.3 Compost

Consider composting on site if a reasonable amount of compostable material will be available. Compostable materials include plant material, sawdust, and certain food scraps.

1.10.4 Waste.

Dispose of materials with no practical use or economic benefit to waste-to-energy plants where available. As the last choice, dispose of materials at a landfill or incinerator.

1.10.5 Return

Set aside and protect misdelivered and substandard products and materials and return to supplier for credit.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used. -- End of Section --

SECTION 01 78 23

OPERATION AND MAINTENANCE DATA
08/15

PART 1 GENERAL

1.1 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance with Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-10 Operation and Maintenance Data

O&M Database ; G

Training Plan ; G

Training Outline ; G

Training Content ; G

SD-11 Closeout Submittals

Training Video Recording ; G

Validation of Training Completion ; G

1.2 OPERATION AND MAINTENANCE DATA

Submit Operation and Maintenance (O&M) Data for the provided equipment, product, or system, defining the importance of system interactions, troubleshooting, and long-term preventive operation and maintenance. Compile, prepare, and aggregate O&M data to include clarifying and updating the original sequences of operation to as-built conditions. Organize and present information in sufficient detail to clearly explain O&M requirements at the system, equipment, component, and subassembly level. Include an index preceding each submittal. Submit in accordance with this section and Section 01 33 00 SUBMITTAL PROCEDURES.

1.2.1 Package Quality

Documents must be fully legible. Operation and Maintenance data must be consistent with the manufacturer's standard brochures, schematics, printed instructions, general operating procedures, and safety precautions.

1.2.2 Package Content

Provide data package content in accordance with paragraph SCHEDULE OF OPERATION AND MAINTENANCE DATA PACKAGES. Comply with the data package requirements specified in the individual technical sections, including the content of the packages and addressing each product, component, and system designated for data package submission. Provide a Data Package as

specified in the individual technical section, for items that are commissioned.

1.2.3 Changes to Submittals

Provide manufacturer-originated changes or revisions to submitted data if a component of an item is so affected subsequent to acceptance of the O&M Data. Submit changes, additions, or revisions required by the Contracting Officer for final acceptance of submitted data within 30 calendar days of the notification of this change requirement.

1.2.4 Commissioning Authority Review and Approval

Submit the commissioned systems and equipment submittals to the Commissioning Authority (CxA) to review for completeness and applicability. Obtain validation from the CxA that the systems and equipment provided meet the requirements of the Contract documents and design intent, particularly as they relate to functionality, energy performance, water performance, maintainability, sustainability, system cost, indoor environmental quality, and local environmental impacts. The CxA communicates deficiencies to the Contracting Officer. Submit the O&M manuals to the Contracting Officer upon a successful review of the corrections, and with the CxA recommendation for approval and acceptance of these O&M manuals. This work is in addition to the normal review procedures for O&M data.

1.3 O&M DATABASE

Develop an editable, electronic spreadsheet based on the equipment in the Operation and Maintenance Manuals that contains the information required to start a preventive maintenance program. As a minimum, provide list of system equipment, location installed, warranty expiration date, manufacturer, model, and serial number.

1.4 OPERATION AND MAINTENANCE MANUAL FILE FORMAT

Assemble data packages into electronic Operation and Maintenance Manuals. Assemble each manual into a composite electronically indexed file using the most current version of Adobe Acrobat or similar software capable of producing PDF file format. Provide compact disks (CD) or data digital versatile disk (DVD) as appropriate, so that each one contains operation, maintenance and record files, project record documents, and training videos. Include a complete electronically linked operation and maintenance directory.

1.4.1 Organization

Bookmark Product and Drawing Information documents using the current version of CSI Masterformat numbering system, and arrange submittals using the specification sections as a structure. Use CSI Masterformat and UFGS numbers along with descriptive bookmarked titles that explain the content of the information that is being bookmarked.

1.4.2 CD or DVD Label and Disk Holder or Case

Provide the following information on the disk label and disk holder or case:

a. Building Number

b. Project Title

c. Activity and Location

d. Construction Contract Number

e. Prepared For: (Contracting Agency)

f. Prepared By: (Name, title, phone number and email address)

g. Include the disk content on the disk label

h. Date

i. Virus scanning program used

1.5 TYPES OF INFORMATION REQUIRED IN O&M DATA PACKAGES

The following are a detailed description of the data package items listed in paragraph SCHEDULE OF OPERATION AND MAINTENANCE DATA PACKAGES.

1.5.1 Operating Instructions

Provide specific instructions, procedures, and illustrations for the following phases of operation for the installed model and features of each system:

1.5.1.1 Safety Precautions and Hazards

List personnel hazards and equipment or product safety precautions for operating conditions. List all residual hazards identified in the Activity Hazard Analysis provided under Section 01 35 26 GOVERNMENT SAFETY REQUIREMENTS. Provide recommended safeguards for each identified hazard.

1.5.1.2 Operator Prestart

Provide procedures required to install, set up, and prepare each system for use.

1.5.1.3 Startup, Shutdown, and Post-Shutdown Procedures

Provide narrative description for Startup, Shutdown and Post-shutdown operating procedures including the control sequence for each procedure.

1.5.1.4 Normal Operations

Provide Control Diagrams with data to explain operation and control of systems and specific equipment. Provide narrative description of Normal Operating Procedures.

1.5.1.5 Emergency Operations

Provide Emergency Procedures for equipment malfunctions to permit a short period of continued operation or to shut down the equipment to prevent further damage to systems and equipment. Provide Emergency Shutdown Instructions for fire, explosion, spills, or other foreseeable contingencies. Provide guidance and procedures for emergency operation of utility systems including required valve positions, valve locations and zones or portions of systems controlled.

1.5.1.6 Operator Service Requirements

Provide instructions for services to be performed by the operator such as lubrication, adjustment, inspection, and recording gauge readings.

1.5.1.7 Environmental Conditions

Provide a list of Environmental Conditions (temperature, humidity, and other relevant data) that are best suited for the operation of each product, component or system. Describe conditions under which the item equipment should not be allowed to run.

1.5.1.8 Operating Log

Provide forms, sample logs, and instructions for maintaining necessary operating records.

1.5.1.9 Additional Requirements for HVAC Control Systems

Provide Data Package 5 and the following for control systems:

a. Narrative description on how to perform and apply functions, features, modes, and other operations, including unoccupied operation, seasonal changeover, manual operation, and alarms. Include detailed technical manual for programming and customizing control loops and algorithms.

b. Full as-built sequence of operations.

c. Copies of checkout tests and calibrations performed by the Contractor (not Cx tests).

d. Full points list. Provide a listing of rooms with the following information for each room:

(1) Floor

(2) Room number

(3) Room name

(4) Air handler unit ID

(5) Reference drawing number

(6) Air terminal unit tag ID

(7) Heating or cooling valve tag ID

(8) Minimum cfm

(9) Maximum cfm

e. Full print out of all schedules and set points after testing and acceptance of the system.

f. Full as-built print out of software program.

g. Marking of system sensors and thermostats on the as-built floor plan

and mechanical drawings with their control system designations.

1.5.2 Preventive Maintenance

Provide the following information for preventive and scheduled maintenance to minimize repairs for the installed model and features of each system. Include potential environmental and indoor air quality impacts of recommended maintenance procedures and materials.

1.5.2.1 Lubrication Data

Include the following preventive maintenance lubrication data, in addition to instructions for lubrication required under paragraph OPERATOR SERVICE REQUIREMENTS:

a. A table showing recommended lubricants for specific temperature ranges and applications.

b. Charts with a schematic diagram of the equipment showing lubrication points, recommended types and grades of lubricants, and capacities.

c. A Lubrication Schedule showing service interval frequency.

1.5.2.2 Preventive Maintenance Plan, Schedule, and Procedures

Provide manufacturer's schedule for routine preventive maintenance, inspections, condition monitoring (predictive tests) and adjustments required to ensure proper and economical operation and to minimize repairs. Provide instructions stating when the systems should be retested. Provide manufacturer's projection of preventive maintenance work-hours on a daily, weekly, monthly, and annual basis including craft requirements by type of craft. For periodic calibrations, provide manufacturer's specified frequency and procedures for each separate operation.

a. Define the anticipated time required to perform each of each test (work-hours), test apparatus, number of personnel identified by responsibility, and a testing validation procedure permitting the record operation capability requirements within the schedule. Provide a remarks column for the testing validation procedure referencing operating limits of time, pressure, temperature, volume, voltage, current, acceleration, velocity, alignment, calibration, adjustments, cleaning, or special system notes. Delineate procedures for preventive maintenance, inspection, adjustment, lubrication and cleaning necessary to minimize repairs.

b. Repair requirements must inform operators how to check out, troubleshoot, repair, and replace components of the system. Include electrical and mechanical schematics and diagrams and diagnostic techniques necessary to enable operation and troubleshooting of the system after acceptance.

1.5.3 Repair

Provide manufacturer's recommended procedures and instructions for correcting problems and making repairs.

1.5.3.1 Troubleshooting Guides and Diagnostic Techniques

Provide step-by-step procedures to promptly isolate the cause of typical malfunctions. Describe clearly why the checkout is performed and what conditions are to be sought. Identify tests or inspections and test equipment required to determine whether parts and equipment may be reused or require replacement.

1.5.3.2 Wiring Diagrams and Control Diagrams

Provide point-to-point drawings of wiring and control circuits including factory-field interfaces. Provide a complete and accurate depiction of the actual job specific wiring and control work. On diagrams, number electrical and electronic wiring and pneumatic control tubing and the terminals for each type, identically to actual installation configuration and numbering.

1.5.3.3 Repair Procedures

Provide instructions and a list of tools required to repair or restore the product or equipment to proper condition or operating standards.

1.5.3.4 Removal and Replacement Instructions

Provide step-by-step procedures and a list of required tools and supplies for removal, replacement, disassembly, and assembly of components, assemblies, subassemblies, accessories, and attachments. Provide tolerances, dimensions, settings and adjustments required. Use a combination of text and illustrations.

1.5.3.5 Spare Parts and Supply Lists

Provide lists of spare parts and supplies required for repair to ensure continued service or operation without unreasonable delays. Special consideration is required for facilities at remote locations. List spare parts and supplies that have a long lead-time to obtain.

1.5.3.6 Repair Work-Hours

Provide manufacturer's projection of repair work-hours including requirements by type of craft. Identify, and tabulate separately, repair that requires the equipment manufacturer to complete or to participate.

1.5.4 Real Property Equipment

Provide a list of installed equipment furnished under this contract. Include all information usually listed on manufacturer's name plate. In the "EQUIPMENT-IN-PLACE LIST" include, as applicable, the following for each piece of equipment installed: description of item, location (by room number), model number, serial number, capacity, name and address of manufacturer, name and address of equipment supplier, condition, spare parts list, manufacturer's catalog, and warranty. Submit the final list 30 days after transfer of the completed facility.

Key the designations to the related area depicted on the contract drawings. List the following data:

RECORD OF DESIGNATED EQUIPMENT AND MATERIALS DATA				
Description	Specification Section	Manufacturer and Catalog, Model, and Serial Number	Composition and Size	Where Used

1.5.5 Appendices

Provide information required below and information not specified in the preceding paragraphs but pertinent to the maintenance or operation of the product or equipment. Include the following:

1.5.5.1 Product Submittal Data

Provide a copy of SD-03 Product Data submittals documented with the required approval.

1.5.5.2 Manufacturer's Instructions

Provide a copy of SD-08 Manufacturer's Instructions submittals documented with the required approval.

1.5.5.3 O&M Submittal Data

Provide a copy of SD-10 Operation and Maintenance Data submittals documented with the required approval.

1.5.5.4 Parts Identification

Provide identification and coverage for the parts of each component, assembly, subassembly, and accessory of the end items subject to replacement. Include special hardware requirements, such as requirement to use high-strength bolts and nuts. Identify parts by make, model, serial number, and source of supply to allow reordering without further identification. Provide clear and legible illustrations, drawings, and exploded views to enable easy identification of the items. When illustrations omit the part numbers and description, both the illustrations and separate listing must show the index, reference, or key number that will cross-reference the illustrated part to the listed part. Group the parts shown in the listings by components, assemblies, and subassemblies in accordance with the manufacturer's standard practice. Parts data may cover more than one model or series of equipment, components, assemblies, subassemblies, attachments, or accessories, such as typically shown in a master parts catalog.

1.5.5.5 Warranty Information

List and explain the various warranties and clearly identify the servicing and technical precautions prescribed by the manufacturers or contract documents in order to keep warranties in force. Include warranty information for primary componentsof the system. Provide copies of warranties as required.

1.5.5.6 Extended Warranty Information

List all warranties for products, equipment, components, and sub-components whose duration exceeds one year. For each warranty listed, indicate the applicable specification section, duration, start date, end date, and the point of contact for warranty fulfillment. Also, list or reference the specific operation and maintenance procedures that must be performed to keep the warranty valid. Provide copies of warranties as required.

1.5.5.7 Personnel Training Requirements

Provide information available from the manufacturers that is needed for use in training designated personnel to properly operate and maintain the equipment and systems.

1.5.5.8 Testing Equipment and Special Tool Information

Include information on test equipment required to perform specified tests and on special tools needed for the operation, maintenance, and repair of components. Provide final set points.

1.5.5.9 Testing and Performance Data

Include completed prefunctional checklists, functional performance test forms, and monitoring reports. Include recommended schedule for retesting and blank test forms. Provide final set points.

1.5.5.10 Field Test Reports

Provide a copy of Field Test Reports (SD-06) submittals documented with the required approval.

1.5.5.11 Contractor Information

Provide a list that includes the name, address, and telephone number of the General Contractor and each Subcontractor who installed the product or equipment, or system. For each item, also provide the name address and telephone number of the manufacturer's representative and service organization that can provide replacements most convenient to the project site. Provide the name, address, and telephone number of the product, equipment, and system manufacturers.

1.6 SCHEDULE OF OPERATION AND MAINTENANCE DATA PACKAGES

Provide the O&M data packages specified in individual technical sections. The information required in each type of data package follows:

1.6.1 Data Package 1

a. Safety precautions and hazards

b. Cleaning recommendations

c. Maintenance and repair procedures

d. Warranty information

e. Extended warranty information

f. Contractor information

g. Spare parts and supply list

1.6.2 Data Package 2

a. Safety precautions and hazards

b. Normal operations

c. Environmental conditions

d. Lubrication data

e. Preventive maintenance plan, schedule, and procedures

f. Cleaning recommendations

g. Maintenance and repair procedures

h. Removal and replacement instructions

i. Spare parts and supply list

j. Parts identification

k. Warranty information

l. Extended warranty information

m. Contractor information

1.6.3 Data Package 3

a. Safety precautions and hazards

b. Operator prestart

c. Startup, shutdown, and post-shutdown procedures

d. Normal operations

e. Emergency operations

f. Environmental conditions

g. Operating log

h. Lubrication data

i. Preventive maintenance plan, schedule, and procedures

j. Cleaning recommendations

k. Troubleshooting guides and diagnostic techniques

l. Wiring diagrams and control diagrams

m. Maintenance and repair procedures

n. Removal and replacement instructions

o. Spare parts and supply list

p. Product submittal data

q. O&M submittal data

r. Parts identification

s. Warranty information

t. Extended warranty information

u. Testing equipment and special tool information

v. Testing and performance data

w. Contractor information

x. Field test reports

1.6.4 Data Package 4

a. Safety precautions and hazards

b. Operator prestart

c. Startup, shutdown, and post-shutdown procedures

d. Normal operations

e. Emergency operations

f. Operator service requirements

g. Environmental conditions

h. Operating log

i. Lubrication data

j. Preventive maintenance plan, schedule, and procedures

k. Cleaning recommendations

l. Troubleshooting guides and diagnostic techniques

m. Wiring diagrams and control diagrams

n. Repair procedures

o. Removal and replacement instructions

p. Spare parts and supply list

q. Repair work-hours

r. Product submittal data

s. O&M submittal data

t. Parts identification

u. Warranty information

v. Extended warranty information

w. Personnel training requirements

x. Testing equipment and special tool information

y. Testing and performance data

z. Contractor information

aa. Field test reports

1.6.5 Data Package 5

a. Safety precautions and hazards

b. Operator prestart

c. Start-up, shutdown, and post-shutdown procedures

d. Normal operations

e. Environmental conditions

f. Preventive maintenance plan, schedule, and procedures

g. Troubleshooting guides and diagnostic techniques

h. Wiring and control diagrams

i. Maintenance and repair procedures

j. Removal and replacement instructions

k. Spare parts and supply list

l. Product submittal data

m. Manufacturer's instructions

n. O&M submittal data

o. Parts identification

p. Testing equipment and special tool information

q. Warranty information

r. Extended warranty information

s. Testing and performance data

t. Contractor information

u. Field test reports

v. Additional requirements for HVAC control systems

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 TRAINING

Prior to acceptance of the facility by the Contracting Officer for Beneficial Occupancy, provide comprehensive training for the systems and equipment specified in the technical specifications. The training must be targeted for the building maintenance personnel, and applicable building occupants. Instructors must be well-versed in the particular systems that they are presenting. Address aspects of the Operation and Maintenance Manuals. Training must include classroom or field lectures based on the system operating requirements. The location of classroom training requires approval by the Contracting Officer.

3.1.1 Training Plan

Submit a written training plan to the Contracting Officer for approval at least 60 calendar days prior to the scheduled training. Training plan must be approved by the Quality Control Manager (QC)or the Commissioning Authority (CxA) prior to forwarding to the Contracting Officer. Also, coordinate the training schedule with the Contracting Officer and QC or CxA. Include within the plan the following elements:

a. Equipment included in training

b. Intended audience

c. Location of training

d. Dates of training

e. Objectives

f. Outline of the information to be presented and subjects covered including description

g. Start and finish times and duration of training on each subject

h. Methods (e.g. classroom lecture, video, site walk-through, actual operational demonstrations, written handouts)

i. Instructor names and instructor qualifications for each subject

j. List of texts and other materials to be furnished by the Contractor that are required to support training

k. Description of proposed software to be used for video recording of training sessions.

3.1.2 Training Content

The core of this training must be based on manufacturer's recommendations and the operation and maintenance information. The QC or CxA is responsible for overseeing and approving the content and adequacy of the training. Spend 95 percent of the instruction time during the presentation on the OPERATION AND MAINTENANCE DATA. Include the following for each system training presentation:

a. Start-up, normal operation, shutdown, unoccupied operation, seasonal changeover, manual operation, controls set-up and programming, troubleshooting, and alarms.

b. Relevant health and safety issues.

c. Discussion of how the feature or system is environmentally responsive. Advise adjustments and optimizing methods for energy conservation.

d. Design intent.

e. Use of O&M Manual Files.

f. Review of control drawings and schematics.

g. Interactions with other systems.

h. Special maintenance and replacement sources.

i. Tenant interaction issues.

3.1.3 Training Outline

Provide the Operation and Maintenance Manual Files (Bookmarked PDF) and a written course outline listing the major and minor topics to be discussed by the instructor on each day of the course to each trainee in the course. Provide the course outline 14 calendar days prior to the training.

3.1.4 Training Video Recording

Record classroom training session(s) on video. Provide to the Contracting Officer two copies of the training session(s) in DVD video recording format. Capture within the recording, in video and audio, the instructors' training presentations including question and answer periods with the attendees. The recording camera(s) must be attended by a person during the recording sessions to assure proper size of exhibits and projections during the recording are visible and readable when viewed as training.

3.1.5 Unresolved Questions from Attendees

If, at the end of the training course, there are questions from attendees that remain unresolved, the instructor must send the answers, in writing, to the Contracting Officer for transmittal to the attendees, and the training video must be modified to include the appropriate clarifications.

3.1.6 Validation of Training Completion

Ensure that each attendee at each training session signs a class roster daily to confirm Government participation in the training. At the

completion of training, submit a signed validation letter that includes a sample record of training for reporting what systems were included in the training, who provided the training, when and where the training was performed, and copies of the signed class rosters. Provide two copies of the validation to the Contracting Officer, and one copy to the Operation and Maintenance Manual Preparer for inclusion into the Manual's documentation.

3.1.7 Quality Control Coordination

Coordinate this training with the QC or CxA in accordance with Section 01 45 00.00 10 QUALITY CONTROL.

-- End of Section --

SECTION 01 14 00.05 19

DEPARTMENT OF VETERANS' AFFAIRS - GLOSSARY of TERMS:

DB	Design-Build
DBIA	Design Build Institute of America http://www.dbia.org/
DAV	Department of Veterans Affairs
VA	Department of Veterans Affairs
CFM	Department of Veterans Affairs – Office of Construction and Facilities Management
VACO	Department of Veterans Affairs Central Office
FMS	Facility Management Service (VAMC Medical Center)
COTR	Contracting Officers Technical Representative (VAMC Medical Center FMS)
GE	General Engineer (VAMC Medical Center FMS)
IRMS	Information Resource Management Service (VAMC Medical Center)
NBT	New Bed Tower Addition
JAHVH	James A. Haley Veterans' Hospital - Tampa
MC	VA Tampa Medical Center
VAMC	Veterans' Affairs Medical Center - Tampa
MS&N	Medical/Surgical Nursing
MOT	Maintenance of Traffic (Vehicular, Pedestrian, etc.)
ICU	Intensive Care Unit
RE	Resident Engineer (employed by DVA CFM)
SRE	Senior Resident Engineer (employed by DVA CFM)
CO	Contracting Officer (employed by DVA CFM or VAMC Tampa)
Proj Exec	Project Executive (employed by DVA CFM)
RFP	Request for Proposal
RFP-AE	Architect-Engineering Team who authored this DB RFP
AE2	Architect-Engineering Designer of Record - Contracted to the selected Design Builder
RFP	Request for Proposal
WBDG	Whole Building Design Guide
UFGS	United Facility Guide Specifications
VA TIL	http://www.cfm.va.gov/til/ The VA CFM's online repository for facility design and construction standards.

SECTION 01 14 00.05 20
WORK RESTRICTIONS FOR DESIGN-BUILD

PART 1 GENERAL

1.1 RELATED SECTIONS:

01 14 00.05 20_Appndx A	OSHA training (VA TAMPA)
01 14 00.05 20_Appndx C	ShutDwns (VA TAMPA)
01 14 00.05 20_Appndx D	Safty+InfecCntrl (VA TAMPA)
01 14 00.05 20_Attchmnt 1a+1b	Impaired FP (VA TAMPA)
01 14 00.05 20_Attchmnt 2	HotWrkPermit (VA TAMPA)
01 14 00.05 20_Attchmnt 3	HotWrkChkLst (VA TAMPA)
01 14 00.05 20_Attchmnt 4	FS ChkLst (VA TAMPA)
01 14 00.05 20_Attchmnt 5a+5b	GC Wrkpln (VA TAMPA)
01 14 00.05 20_Attchmnt 6	Security Training (VA TAMPA)

1.2.1 SUBMITTALS

The use of a "G" following a submittal indicates that a Government approval action is required. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES FOR DESIGN BUILD

SD-01 Preconstruction Submittals

List of contact personnel

Personnel List

Vehicle List

1.2.2 SPECIAL SCHEDULING REQUIREMENTS

a. Permission to interrupt any Activity roads, and/or utility service shall be requested in writing a minimum of 24 calendar days prior to the desired date of interruption. Refer to Appendix C, General Narrative Of Documentation Requirements For Planned Utility Shutdowns.

1.3 CONTRACTOR ACCESS AND USE OF PREMISES

1.3.1 Activity Regulations

Ensure that Contractor personnel employed on the Activity become familiar with and obey Activity regulations including safety, fire, traffic and security regulations. Keep within the limits of the work and avenues of ingress and egress. To minimize traffic congestion, delivery of materials shall be outside of the peak traffic hours of 6:30 to 8:00 a.m. unless otherwise approved by the Contracting Officer. Wear hard hats in designated areas. Do not enter any restricted areas unless required to do so and until cleared for such entry. The Contractor's equipment shall be conspicuously marked for identification.

1.3.1.1 Subcontractors and Personnel Contacts

Furnish a list of contact personnel of the Contractor and subcontractors including addresses and telephone numbers for use in the event of an emergency. As changes occur and additional information becomes available,

correct and change the information contained in previous lists.

1.3.1.2 Identification Badges

Identification badges must be obtained through the local facility security police.

1.3.2 Working Hours

Regular working hours shall consist of a 12 hour period between 7:00 a.m. and 7:00 p.m., Monday through Friday, excluding Government holidays.

1.3.3 Work Outside Regular Hours

Work outside regular working hours requires Contracting Officer approval. Make application 15 calendar days prior to such work to allow arrangements to be made by the Government, giving the specific dates, hours, location, type of work to be performed, contract number and project title. Based on the justification provided, the Contracting Officer may approve work outside regular hours. During periods of darkness, the different parts of the work shall be lighted in a manner approved by the Contracting Officer.

1.3.4 Utility Cutovers and Interruptions

a. Make utility cutovers and interruptions after normal working hours or on Saturdays, Sundays, and Government holidays. Conform to procedures required in the paragraph "Work Outside Regular Hours."

b. Ensure that new utility lines are complete, except for the connection, before interrupting existing service.

c. Interruption to water, sanitary sewer, storm sewer, telephone service, electric service, air conditioning, heating, and fire alarm, shall be considered utility cutovers pursuant to the paragraph entitled "Work Outside Regular Hours."

d. Operation of Station Utilities: The Contractor shall not operate nor disturb the setting of control devices in the station utilities system, including water, sewer, and electrical,. The Government will operate the control devices as required for normal conduct of the work. The Contractor shall notify the Contracting Officer giving reasonable advance notice when such operation is required.

e. All work on existing and new electrical systems shall be done de-energized.

1.3.4.1 Location of Underground Utilities

Obtain excavation permits prior to start of excavation by contacting the Contracting Officer 15 calendar days in advance. Scan the construction site with electromagnetic or sonic equipment, and mark the surface of the ground or paved surface where existing underground utilities or utilities encased in pier structures are discovered. Verify the elevations of existing piping, utilities, and any type of underground or encased obstruction not indicated to be specified or removed but indicated or discovered during scanning in locations to be traversed by piping, ducts, and other work to be conducted or installed.

1.4 SECURITY REQUIREMENTS and TRAINING

a. Refer to Section 01 00 00 General Requirements

b. Refer to Attachment 6, VA Information and Information System Security/Privacy Language

1.5 SAFETY AND INFECTION CONTROL

a. Refer to Section 01 00 00 General Requirements
b. Refer to Appendix A, OSHA Training
C. Refer to Appendix D, Safety and Infection Control Guide

1.6 Fire Protection

a. Refer to Section 01 00 00 General Requirements
b. Impaired Fire Protection By Contractor - Refer to Attachment 1a & 1b, Notification Of Impaired Fire Protection By Contractor Personnel.
c. Construction Fire Safety - Refer to Attachment 4, Construction Fire Safety Check List

1.7 HOT WORK

a. Refer to Section 01 00 00 General Requirements
b. Hot Work Operations - Refer to Attachment 2, Notification Of Hot Work Operations By Contractor Personnel (Burn Permit)
c. Fire Safety Check List - Refer to Attachment 3, Hot Work Fire Safety Check List For Operations Area Inspection

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 01 14 00.05 20
WORK RESTRICTIONS FOR DESIGN-BUILD

Appendix A

Approved OSHA Training Providers List

Current List of Approved Outreach On-line Training Websites:

Construction 10 hour

A. Bright Brains / AdvanceOnline - www.advanceonline.com and hosted through:
   1. Region X OSHA Training Institute Education Center: www.regionxoti.org
   2. AGC: http://agc.advanceonline.com
   3. JJ Keller: www.keller-itc.com
B. ClickSafety - www.clicksafety.com and hosted through:
   1. Keene State College: www.keene.edu/conted/osha.cfm
C. 360Training - www.oshacampus.com and hosted through:
   1. Eastern Kentucky University - http://eku.360training.com
   2. Metropolitan Community Colleges - http://mcc.360training.com
   3. Red Rocks Community College - http://rrcc.360training.com
   4. WESTEC OSHA ED Center - http://westec.360training.com

Construction 30 hour

A. Turner Construction - https://www.turnerknowledge.com/turner/livelink.exe?func=login.channelpartner
B. ClickSafety - www.clicksafety.com and hosted through:
   1. Keene State College: www.keene.edu/conted/osha.cfm

SECTION 01 14 00.05 20
WORK RESTRICTIONS FOR DESIGN-BUILD

Appendix C

Proper Procedures and Forms for all Access Closures, Utility Shutdowns and Live Electrical Work Request

GENERAL NARRATIVE OF DOCUMENTATION REQUIREMENTS FOR PLANNED UTILITY SHUTDOWNS

General: All of the following types of work will be documented by the requesting party (contractor or in-house maintenance person) in a file folder fitted with two-hole prong paper fasteners. Fasteners will be attached to the tops of each cover of the file folder. This narrative should be used in conjunction with the Utility Shutdown Flow Chart for a clear understanding of the shutdown process.

1. **Planned Utility Shutdown:**
   In accordance with Hospital Policy Memorandum No. HPM 138-23, June 2007, a request for utility shutdown must be presented to the Chief, Facilities Management Service (FMS), for evaluation and action to determine whether the shutdown will be classified as routine or major.
   A. A **Draft Utility Shutdown** Notice is initiated by the requesting party and upon completion will be stapled to the outside front-cover of the file folder.
   B. The **Planned Utility Interruption/ Checklist** will be attached to the inside front-cover using the two-hole prong fastener.
   C. The **Work Plan / Peer Review** form (attachment #5A) is initiated and attached to the inside back-cover using the two-hole prong fastener.
   D. All **Supporting Documents** will be attached to the inside back-cover of the file folder in reverse chronological order (most

recent on top). These documents include, but are not limited to, (1) any required permits (enclosed space, above ceiling, etc.) and approvals, (2) drawings / sketches of work, (3) meeting minutes, (4) coordination with affected services, (5) Mitigation Plan, (6) Contingency Plan, (7) shutdown procedures, and (8) start-up procedures, or as required by the Approving Official (Chief, FMS).

2. **Live Electrical Work:**

In accordance with VHA Directive 2006–056, any energized electrical work plan

must have the prior knowledge and approval of the Medical Center Director

(Exception – The Chief, FMS may approve energized electrical work plans for

Branch Circuits, from the final overcurrent protecting devices to the outlets,

that do not serve the critical patient care areas, such as Operating Rooms,

Critical Care, Intensive Care, Dialysis Units, Isolation Rooms, Catheterization

Laboratories, Emergency Rooms, or Supply, Processing, and Distribution (SPD)

rooms).

A. The **Request to Perform Live Electrical Work** (memo to the Hospital Director) is initiated and upon approval will be attached to the inside back-cover using the two-hole prong fastener.

B. The **Work Plan / Peer Review** form (attachment #5A) is initiated and attached to the inside back-cover using the two-hole prong fastener.

C. All **Supporting Documents** will be attached to the inside back-cover of the file folder in reverse chronological order (most recent on top). These documents include, but are not limited to, (1) any required permits (enclosed space, above ceiling, etc.) and approvals, (2) drawings / sketches of work, (3) meeting minutes, and (4) coordination with affected services.

3. **Hot Work (Burn):**

Facilities Management Service Standard Operating Procedures No. 138-05, August 2009, defines Hot Work as operations which include "… cutting, welding, brazing, silver soldering and other processes that utilize an open flame or arc." Please note that although Live Electrical Work is sometimes referred to in the trade as Hot Work, it is not (within the context of this document) since under normal working conditions it will not result in an open flame or arc.

A. The **Hot Work (Burn) Permit** is initiated and consists of two documents – the Notification of Hot Work Operations by Contractor Personnel (Burn Permit) and the Hot Work Fire Safety Check List for Operations Area Inspection (Attachments 2 & 3). Upon approval it will be posted at the job site until all work has been completed. After completion of work, the documents will be attached to the inside back-cover of the file folder.

B. The **Work Plan / Peer Review** form (attachment #5A) is initiated and attached to the inside back-cover using the two-hole prong fastener.

C. All **Supporting Documents** will be attached to the inside back-cover of the file folder in reverse chronological order (most recent on top). These documents include, but are not limited to, (1) any required permits (enclosed space, above ceiling, etc.) and approvals, (2) drawings / sketches of work, (3) meeting minutes, and (4) coordination with affected services. The following flowchart is based on the Planned Utility Interruption Checklist included within Appendix C.

4. **Planned Access Closure Request:**

A. A request for an access closure must be presented to the Chief, Facilities Management Service (FMS), for evaluation and action to

determine whether the closure will be classified as routine or major.

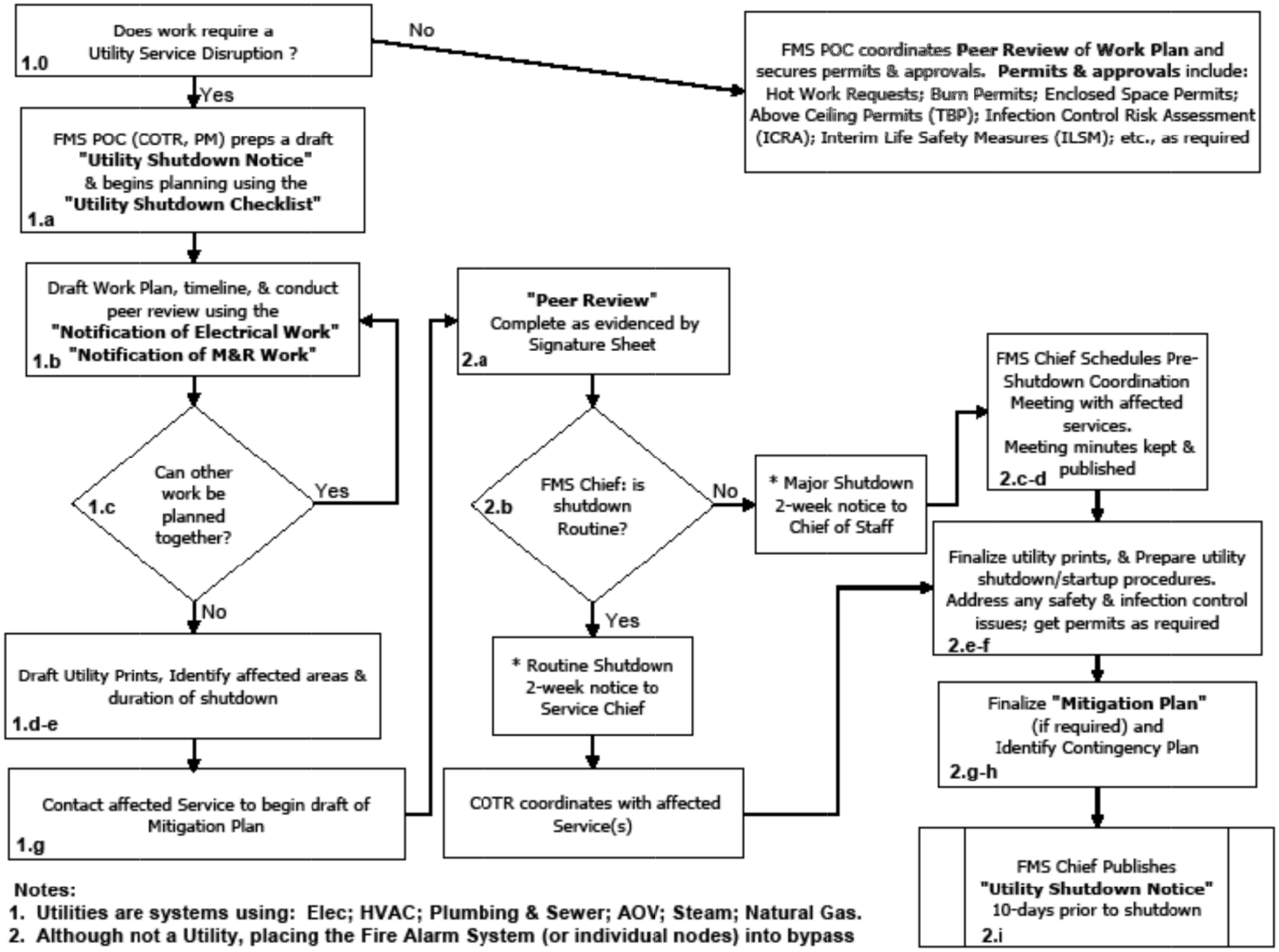
B. A **Draft Closure Notice** is initiated by the requesting party and upon completion will be stapled to the outside front-cover of the file folder.

C. The **Planned Utility Interruption/Closure Checklist** will be attached to the inside front-cover using the two-hole prong fastener.

D. The **Work Plan and Peer Review** form (attachment #5A) is initiated and attached to the inside back-cover using the two-hole prong fastener.

E. All **Supporting Documents** will be attached to the inside back-cover of the file folder in reverse chronological order (most recent on top). These documents include, but are not limited to, (1) any required permits (enclosed space, above ceiling, etc.) and approvals, (2) drawings / sketches of work, (3) meeting minutes, (4) coordination with affected services, (5) Mitigation Plan, (6) Contingency Plan, (7) shutdown procedures, and (8) start-up procedures, or as required by the Approving Official (Chief, FMS).

Flowchart - Planned Utility Shutdown



Notes:

1. **Utilities are systems using: Elec; HVAC; Plumbing & Sewer; AOV; Steam; Natural Gas.**
2. **Although not a Utility, placing the Fire Alarm System (or individual nodes) into bypass**

PLANNED UTILITY INTERRUPTION CHECKLIST

Project Name: _____ **Project #** _____

COTR Name: _____ **Phone #:** (_____)_____

1. Utility Shutdown Request

#	Item	POC	Comments
1.a.	Draft Utility Shutdown Notice	COTR	
1.b	Work Plan, draft Timeline & Peer review	Contractor / COTR	
1.c	Other Work Plans (Piggyback work)	M&O / COTR	
1.d	Utility prints marked with isolation points for valves, equipment	COTR / M&O	
1.e	Identify affected areas / services	COTR / M&O	
1.f	Identify duration of shutdown	Contractor / COTR	
1.g	Draft mitigation plan	COTR / M&O	

2. Planning the Shutdown

#	Item	POC	Comments
2.a.	Peer Review complete	COTR	
2.b	Chief FMS determines "Routine" or "Major" shutdown	Chief FMS	
2.c	Coordination meetings as applicable		
2.d	Coordinate with affected areas & services*	COTR / M&O	
2.e	Prepare utility shutdown and start-up procedures	M&O Shops	
2.f	Verify & update prints	COTR	
2.g	Finalize Utility Mitigation Plan	M&O	
2.h	Identify Contingency Plan	COTR / M&O	
2.i	Publish Utility Shutdown Notice	COTR	

*Include respiratory therapy on all AOV-related system modifications.

3. Preparation

#	Item	POC	Comments
3.a.	Tag and mark field verified equipment and locations of valves / breakers, switches, etc that disrupt utilities & hospital services*	M&O	
3.b	Stage work materials, pre-fabricated parts, etc. 24 hours before work is to begin. The COTR is to verify that all materials and tools are present.	Contractor	
3.c	Stage mitigation supplies &	M&O	

	services		
3.d	Shutdown folder to CEP, contents include (as applicable): • Final Shutdown Notice • Work Plan with Peer review & Timeline • Mitigation Plan • POC Lists with contact information • Shutdown and Start up procedures	CEP Supervisor	

*Includes all sources of stored energy and services such as medical gasses.

4. Execution

#	**Item**	**POC**	**Comments**
4.a.	COTR informs CEP to initiate shutdown	COTR	
4.b	CEP initiates shutdown*; equipment is LOTO as planned	CEP	
4.c	Monitor shutdown and informs all parties when utility / service is secure	CEP	
4.d	Tracks progress via the Work Plan Timeline	CEP / COTR	
4.e	Notifies CEP when work is complete	COTR	
4.f	Initiates start up procedures to return the utility to service	CEP	
4.g	Notifies AOD when facility returns to safe state	CEP	

*Contact Repertory Therapy POC whenever AOV-related items are affected.

5. Recovery

#	**Item**	**POC**	**Comments**
5.a	Mitigation measures removed; report completion to CEP	CEP / Shops	
5.b	Update Drawings	COTR	
5.c	File Shutdown Folder	Chief, FMS	

Note: Be sure to include the following on this side of 2-Prong Folder. Some elements may be omitted.

1. Notes from Shutdown Meetings / Coordination
2. Mitigation Plan
3. Contingency Plan
4. Shutdown procedures
5. Work Plan / Peer Review
6. Start up procedures

FACILITIES MANAGEMENT SERVICE - ALERT

Distributed:

UTILITY SHUTDOWN NOTICE

UTILITY AREA(S) AFFECTED:		
TIME / DURATION:	**DATE:**	**ESTIMATED TIME FRAME:**

HOW THIS AFFECTS YOU:
***REASON FOR SHUTDOWN*:**

FMS CONTACT PERSON: _____ , COTR, at ext., or Cell.

If you have any questions or problems with this date, please notify the contact person(s) above by the close of business one day from the date of this publication. After that date, the closure will proceed as described above. Supervisors, please share with all staff.

Chief Facilities Management Service

PLEASE SHARE WITH ALL STAFF

ENERGIZED (LIVE) ELECTRICAL WORK DIRECTOR MEMO

Date: [Enter Today's Date]

From: Facilities Management Service (138)

Subject: Request to Perform Live Electrical Work for the NRM Project No. 673-XX-XXX, "XXXX".

To: Director (00)

1. In accordance with VHA Directive 2006-056 an energized electrical work plan must have the prior knowledge, and approval of the Medical Center Director.

Description of the work being performed, and the circuits impacted by this work:

_____

_____

_____

_____

_____

2. The start date for this work is ____Day____, _____Date_____ at ___Time___. The estimated duration for this work is _____ hours.
3. Any questions or concerns please call [Enter Name of COTR], Project Engineer / COTR, at extension [COTR Number], VA Cell Phone [COTR Number], or e-mail: [Enter COTR email address]@va.gov.

Chief Facilities Management Service

Approve / Disapprove

_____

Kathleen R. Fogarty, Director (00) Date

Enclosure: (#)

HOT TAP WORK PERMIT - EQUIPMENT IN SERVICE (Page 1 OF 3)

Part I: TO BE COMPLETED BY THE REQUESTER:

Note: Separate request required for each individual hot tap. Job/Work Order Number_____

(**1**) Description of piping/equipment/job location: _____

_____

(**2**) Description of work to be done: _____

_____

(**3**) Justification of why the piping/equipment cannot be de-energized through explanation of continuity of service is essential & shutdown impractical (Note: Inconvenience is not a factor):

_____

_____

_____ _____

Requester/Title Date

Part II: TO BE COMPLETED BY THE QUALIFIED PERSONS *DOING* THE WORK:

(**1**) Have personnel executing the "Hot Tap" procedure provided documentation of the necessary level of training to met their responsibilities associated with the procedure: **YES** / **NO (circle)**

(**2**) **Competent Person** oversight is available and will be present during the hot tapping**: YES** / **NO (circle)**

(3) **Welding Required: YES** / **NO (circle)**

Hot Work permit was obtained and includes a specific Hot Tapping Welding Safety Task Review (API-2201, Appendix C): **YES** / **NO (circle)**

(**4**) Emergency Action Plan developed (i.e.API-2201, Appendix D): **YES** / **NO (circle)**

(**5**) Necessary personal protective equipment to safely perform the assigned task (FR Clothing, Welding Helmet, Gloves,
etc…)_____

_____

(**6**) Means employed to restrict the access of unqualified persons from the work area: _____

_____

(**7**) Evidence of completion of a Job Briefing including discussion of any job-related hazards: _____

_____

(**8**) Multi-Gas Meter is available, calibrated, and will be used for monitoring: **YES** / **NO (circle)**

(**9**) Do you agree the above described work can be done safely? **YES** / **NO** (circle: If *no* return to requester)

_____ _____ _____ _____

Contractor/ VA Operation Supervisor(s) Date COTR/VA Project Engineer Date

HOT TAP WORK PERMIT - EQUIPMENT IN SERVICE (Page 2 OF 3)

Part III: RECOMMENDATION(S) TO PERFORM THE WORK WHILE EQUIPMENT IS IN SERVICE:

_____	_____	_____	_____
Chief of Facilities Management	Date	Facility Safety Officer	Date

Part IV: APPROVAL TO PERFORM THE WORK WHILE EQUIPMENT IS IN SERVICE:

_____	_____
Medical Center Director	Date

TO BE FILLED OUT BY THE REQUESTER

TYPE OF PROPOSED INSTALLATION

HEADER OR VESSEL INFORMATION

LINE SIZE (in.)_____ METALLURGY_____ °

OPERATING PRESSURE_____ PSIG TEMPERATURE _____ F

PROCESS DESCRIPTION _____

BRANCH CONNECTION INFORMATION

LINE SIZE (in.)_____ FLANGE RATING_____ PSI

OPERATING PRESSURE_____ METALLURGY _____

INITIATOR _____ DATE _____

Provide location sketch of the proposed hot tap. The hot tap location must have scaffolding (where required for access), insulation must be removed and the equipment must be marked for the exact hot tap location prior to notifying Pressure Equipment Inspection.

HOT TAP WORK PERMIT - EQUIPMENT IN SERVICE (Page 3 OF 3)

TO BE FILLED OUT BY THE CONTRACTOR/VA PROJECT ENGINEER (COMPETENT PERSON) AND PRESSURE EQUIPMENT ENGINEER (QUALIFIED PERSON)

WALL THICKNESS AT HOT TAP LOCATION _____(in.)

DETERMINED BY: _____ DATE: _____

WELD DETAIL NUMBER:

1. PROCEDURE _____ X-RAY _____

2. PROCEDURE _____ X-RAY _____

3. PROCEDURE _____ X-RAY _____

INSPECTOR: _____

TESTS REQUIRED:

(A) NOZZLE _____ PSIG MEDIUM _____

(B) REINFORCING PAD _____ PSIG MEDIUM _____

(C) BLOCK VALVE: HYDROSTATIC SEAT EACH SIDE AT _____ PSIG

AREA INSPECTOR _____ DATE _____

PRESSURE EQUIPMENT ENGINEER_____ DATE _____

TO BE FILLED OUT BY THE CONTRACTOR PERFORMING THE HOT TAP

HOT TAP MACHINE:

MAKE _____ MACHINE RATING: _____ PSIG AT : _____ ^{O}F

MODEL _____ PRESSURE TESTED AT _____ PSIG

SERIAL NO. _____ BY _____ DATE _____

CONTRACTOR REPRESENTATIVE _____ DATE _____

SECTION 01 14 00.05 20
WORK RESTRICTIONS FOR DESIGN-BUILD

Appendix D

Safety and Infection Control Guide

Required to be Posted on the Construction Site

This Safety and Infection Control Guide is for informational purposes only and is not meant to be used in place of the contract.

General Information and Telephone Numbers:

- **CEP** ext. 7080
- **Police** ext. 7554
- **Safety Office** ext. 7292
- **Medical Emergency (Non-Life Threatening)** Dial 911
- **Medical Emergency (Life Threatening)** VA ED / Dial 911

Fire Safety:

- Contractors are to provide their own Fire Extinguishers and are required to perform and document that monthly maintenance has been performed.
- All Contractors' staff should be aware of the exits in and around the construction area and keep them clear.
- If an alarm is activated in the construction area, a member of the construction crew should remain available to advise VA staff as to the cause of the alarm (if known) and dial the CEP at extension 7080.
- Permits are required to perform "Hot Work Operations" including cutting, welding, brazing or silver soldering, or any process that utilizes an open flame.

Safety:

- Ensuring free and unobstructed access to emergency services and for fire, police and other emergency forces.

- Ensuring temporary construction partitions are smoke tight and built of noncombustible or limited combustible materials.
- Any Lock out / Tag out that needs to be done on utilities or equipment in the facility should go through the COTR and VA Maintenance & Operations Supervisor.
- Any penetrations made by Contractors during construction / renovation activities should be sealed (at least temporarily) at the end of the work shift.
- Smoking is not permitted within the Construction site.

The following is the procedure for reporting a fire at the JAH Facility:

FIRE SAFETY FOR CONTRACTORS

(SEGURIDAD CONTRA INCENDIOS PARA CONTRATISTAS)

CODE RED (FIRE)

CODIGO ROJO (FUEGO)

R – Rescue (Rescatar)

A – Alarm (Activar la Alarma)

Pull the nearest pull station. (Activar la alarma contra incendios mas cercana.)

Call 1 – 2 – 3 and inform the operator of location. (Marcar en el teléfono el numero 1-2-3 para informar a la operadora la localización del fuego.)

C – Contain (Close the door / Isolate the area of fire)

(Contener) (Cerrar las puertas / Aislar el área del fuego)

E – Extinguish / Evacuate (Extinguir / Desalojar)

Privacy:

- Patient information found within a construction site should be turned in to the Nurse Manager or COTR.

Security:

- ID Badges must be worn at all times while on duty.
- Parking is allowed in designated areas only.

Infection Control Orientation for Construction Workers

The dirt and dust that are part of construction activities contain hidden infectious hazards. It is not "just dust". One such hazard is fungal organisms such as *Aspergillus*. *Aspergillus* may be found in decaying leaves and compost, plaster and drywall, standing water, and settled dust. These organisms usually do not cause problems in healthy people, but can cause problems in a hospital with sick patients, especially those with lung problems, or in those with poor immunity, such as transplant or cancer patients. Therefore, it is critical that you do your part to keep everyone in the hospital safe and healthy as possible. We, in turn, will make conditions as safe as possible for you.

1. **Medical Waste:**
   a. Hospital staff will remove any medical waste, including sharp object containers (for used needles and syringes), from construction areas prior to the start of projects.
   b. Please notify your supervisor and the COTR or Resident Engineer *immediately* if you (contract workers) find any needles, syringes, sharp medical objects or red bag waste left in the construction area.
2. **Barrier Walls:**
   a. Construction areas *must* be kept separate from patient care areas by barriers that keep the dust and dirt inside the worksite.
   b. Walls must provide a **complete** seal of the construction area from adjacent areas, 1.8.E.2 (walls may be rigid or 6 mil thick plastic)minimum .
   c. Any gaps or breaks in barriers must be repaired immediately.
3. **Environmental Control:**

a. The construction zone and adjacent entry areas shall be maintained daily by the Contractor in a clean and sanitary manner.
b. Vacuum dirt and dust routinely inside the work area. This will minimize dirt tracking on shoes and reduce the dust generation inside the work area. (Sweeping creates more dust in the air).
c. Debris shall not be hauled through patient care areas unless approved by Infection Control and the COTR or Resident Engineer.
d. Demolition debris must be removed in carts with a tightly fitted cover.
e. Do not overfill carts so that cover will not fit tightly.
f. If 6 mil plastic minimum is used as cover, no sharp objects shall be allowed to cut through the plastic.
g. Wipe down the exterior of the carts with a damp rag to remove dust before taking it through the hospital.
h. Debris removal will follow specified traffic patterns and elevator usage.
i. Sticky or walk - off mats (minimum of 24 x 36 inches) shall be placed immediately outside the construction area and are changed regularly (i.e., whenever they no longer remove dirt from feet).
j. Contractor must ensure that their staff mop any dirt / dust tracking which occurs outside the construction barrier by their workers with a damp mop.
k. There shall be no standing water left in the construction area. This includes water in equipment drip pans and any open containers within the construction area.
l. All accidental spills must be cleaned up and dried within 12 hours.
m. Remove and dispose of porous materials that remain damp for more than 48 hours.
n. Optimally, construction-zone air will be exhausted directly to the outside with no potential for re-circulation. If an existing direct exhaust system cannot be located and a tie into re-circulated air system is necessary, a pre-filter and high efficiency filter (95%) will be used prior to exhaust to prevent contamination of the duct. The filters will be changed routinely so that operational performance of unit is maintained.
o. Negative air pressure must be maintained within the construction area for all projects that generate a moderate or high level of dust and are adjacent to any patient care or treatment area.

p. Contractors working in a sterile or invasive procedure area of the hospital will be provided with a disposable coverall, head cover, and shoe covers that must be worn upon entry and removed after exiting that area.
q. Tools and equipment must be damp-wiped prior to entry and exit from sterile and invasive procedure areas.
r. All equipment, tools, material, etc., transported through **occupied** patient areas shall be made free from dust and moisture by vacuuming and wipe down.
s. Water mist work surface to control dust when cutting or drilling.
t. Seal unused doors with duct tape.
u. Block off and seal air vents in construction area to prevent duct contamination.
v. Seal holes, pipes, conduits and punctures appropriately.
w. If demolition chutes are used, they must be sealed when not in use. The chute and damper should be sprayed with water, as necessary, to maintain dust control.
x. Control, collection and disposal must be provided for any drain liquid or sludge found when demolishing plumbing.
y. During outside excavation work, exterior window seals may be required to reduce the amount of outside dust entering the building.

4. Worksite Access Control:

a. Use designated entry and exit procedures.
b. Keep all hospital hallways free of debris and dirt.
c. No unauthorized personnel should be allowed to enter the construction areas.
d. Use designated elevators only.

5. Workers:

a. Clothing and shoes must be free of loose soil and debris when exiting the work area.
b. Use personal protective equipment (masks, face shields, etc.) as indicated for the task at hand.
c. Hand washing is the best method of reducing the transmission of infection. Always wash your hands with soap and water after visiting the restroom, before eating or smoking, and when leaving the construction site.

Please feel free to call the Infection Control Section at:

(813) 972-2000 extensions 4953 or 6953

Pagers 201-1764 or 201-1228

SECTION 01 14 00.05 20
WORK RESTRICTIONS FOR DESIGN-BUILD

ATTACHMENT 1A

NOTIFICATION OF IMPAIRED FIRE PROTECTION BY CONTRACTOR PERSONNEL

PROJECT No. & TITLE: 673-XX-XXX, "XXXX"

NAME OF FACILITY
_____

NOTIFIED BY
_____

TITLE _____
_____

COMPANY
_____

NATURE OF IMPAIRMENT
_____
_____

PRECAUTIONS TO BE TAKEN
_____
_____
_____

CLOSED VALVE NO. _____ IN BLDG. NO. _____ LOCATED IN ROOM _____

CONTROLLING _____

ON DATE: Sn,M,T,W,Th,F,St _____ @ TIME _____ AM/PM

BECAUSE:
_____
_____

ON DATE: Sn,M,T,W,Th,F,St _____ @ TIME _____ AM/PM

COTR _____ WAS CONTACTED AT (813) 972-2000

ext. _____ or (813) _____

DATE/TIME SAFETY OFFICER WAS CONTACTED AT EXT. 7598
_____

DATE/TIME EGCC OPERATOR/CEP WAS CONTACTED AT EXT. 7080
_____

DATE/TIME FIRE DEPARTMENT WAS CONTACTED AT (813) 971-3636
_____

DATE/TIME RSFPE WAS CONTACTED AT (___ __)_____
_____

ATTACHMENT #1 - B

NOTIFICATION OF RESTORED FIRE PROTECTION BY CONTRACTOR PERSONNEL

PROJECT No. & TITLE: 673-XX-XXX, "XXXX"

NAME OF FACILITY

_____

NOTIFIED BY

_____

TITLE _____

_____

COMPANY

_____

NATURE OF IMPAIRMENT

_____

_____

AND FULL PROTECTION RESTORED, EXCEPT

_____

_____

_____

OPENED VALVE NO. _____ IN BLDG. NO. _____ LOCATED IN ROOM _____

CONTROLLING _____

ON DATE: Sn,M,T,W,Th,F,St _____ @ TIME _____ AM/PM

BECAUSE:

_____

_____

ON DATE: Sn,M,T,W,Th,F,St _____ @ TIME _____ AM/PM

COTR _____ WAS CONTACTED AT (813) 972-2000

ext. _____ or (813) _____

DATE/TIME SAFETY OFFICER WAS CONTACTED AT EXT. 7598

_____

DATE/TIME EGCC OPERATOR/CEP WAS CONTACTED AT EXT. 7080

_____

DATE/TIME FIRE DEPARTMENT WAS CONTACTED AT (813) 971-3636

_____

DATE/TIME RSFPE WAS CONTACTED AT (___)_____

_____

SECTION 01 14 00.05 20
WORK RESTRICTIONS FOR DESIGN-BUILD

ATTACHMENT #2

NOTIFICATION OF HOT WORK OPERATIONS BY CONTRACTOR PERSONNEL (BURN PERMIT)

PROJECT No. & TITLE: 673-XX-XXX, "XXXX"

NAME OF FACILITY _____

BUILDING No. & NAME: _____

ON FLOORS: _____

ON DATE: Sn,M,T,W,Th,F,St _____ @ TIME _____ _AM/PM

WORK TO BE DONE:

_____

_____

_____

SPECIAL PRECAUTIONS:

_____

_____

_____

_____

NAME OF FIRE WATCH PERSON IF APPLICABLE:

_____

COMMENTS:

_____

_____

_____

_____

_____

NOTIFIED BY _____

NOTIFIERS SIGNATURE & DATE _____

TITLE & PHONE No. _____

CONTRACTOR _____

COTR _____

APPROVAL _____

COTR SIGNATURE & DATE _____

SAFETY STAFF MEMBER _____

SAFETY SIGNATURE & DATE _____

SECTION 01 14 00.05 20
WORK RESTRICTIONS FOR DESIGN-BUILD

ATTACHMENT #3

HOT WORK FIRE SAFETY CHECK LIST FOR OPERATIONS AREA INSPECTION

PROJECT No. & TITLE: 673-XX-XXX, "XXXX"

DATE:_____

_____ Floor swept clean of combustibles.
_____ Floors wet down, covered with damp sand, metal or other shields.
_____ Combustibles material or flammable liquids removed from area, whenever possible.
_____ Combustibles and flammable liquids protected with covers, guards, or metal shields.
_____ All wall and floor openings covered.
_____ Covers suspended beneath work to collect sparks.

WORK BEING DONE ON WALLS OR CEILINGS

_____ Ensure wall construction is noncombustible and is without combustible covering.
_____ Move combustibles away from opposite side of wall.

WORK BEING DONE ON ENCLOSED EQUIPMENT-(TANKS, DUCTS, ETC.)

_____ Remove all combustibles from enclosures.
_____ Purge containers of flammable vapors. Ensure continuous purge so no vapors accumulate during work.

FIRE WATCH

_____ To be provided during and until 30 minutes after operation.
_____ Provided with a 10-pound dry chemical or halon extinguisher and small hose.
_____ Trained in use of equipment and in sounding fire alarm.

FINAL CHECK-UP

_____ To be made 30 minutes after completion of any operation unless fire watch is provided.
_____ Notify Safety Office (extension 7292) when work is complete. (Contractors - notify COTR)
_____ Notify Graphic Control Center (extension 7080), if any fire zones were by-passed

HOT WORK LOCATION _____

NOTIFIERS SIGNATURE & DATE _____

NAME & PHONE No. _____

CONTRACTOR

_____

COTR SIGNATURE & DATE

_____

SECTION 01 14 00.05 20
WORK RESTRICTIONS FOR DESIGN-BUILD

ATTACHMENT #4

CONSTRUCTION FIRE SAFETY CHECK LIST

(For protection of VA property, patients, visitors and personnel)

PROJECT No. & Title: 673-XX-XXX, "XXXX"

DATE:_____

A. **FIRE EXTINGUISHERS (OSHA 1926.150[c])**

_____ (1) Extinguisher available within 100 feet. Extinguisher rated not less than 2A.
_____ (2) If flammable liquids or gases present, a fire extinguisher rated not less than 10B within 50 feet.

B. IGNITION HAZARDS (OSHA 1926.1511[a])

_____ (1) Internal combustion engines located away from combustibles.
_____ (2) Smoking is prohibited in fire hazard areas (flammables, combustibles).

C. INDOOR STORAGE (OSHA 1926.151[d])

_____ (1) Site kept free from accumulation of unnecessary combustibles.
_____ (2) Storage shall not obstruct means of exits.
_____ (3) Clearance maintained around lights and heating units.

D. FLAMMABLE AND COMBUSTIBLE LIQUIDS (OSHA 1926.152)

_____ (1) Approved containers.
_____ (2) No storage in areas of exits, stairways or people traffic areas.
_____ (3) Max. 25 gal. In room – otherwise approved storage cabinet.

E. TEMPORARY HEATING DEVICES (OSHA 1926.154)

_____ (1) Adequate ventilation for workmen and heater combustion.
_____ (2) Clearance of combustibles from heaters at least 3 feet.
_____ (3) Stability of heater.

F. SIGNS AND BARRICADES (OSHA 1926.200)

_____ (1) Danger signs where immediate hazards exist.
_____ (2) Caution signs where potential hazards exist.
_____ (3) Safety instruction signs where necessary.
_____ (4) Barricades where necessary to protect persons from hazards.

G. WELDING AND CUTTING – HOT WORK PERMIT REQUIRED (NFPA-51B & OSHA 1910.252)

_____ (1) Inspection of area before permit given.
_____ (2) Distance from combustibles 35 feet.
_____ (3) Fire extinguisher in immediate area.
_____ (4) Wall and floor openings covered.
_____ (5) No flammable liquids present.
_____ (6) Inspection after work.

H. ELECTRICAL (OSHA 1924.400-2, 1926.302, & NFPA 241-4)

_____ (1) All temporary wiring grounded and in accordance with National Electric Code (NEC).
_____ (2) Precautions taken to make any open wiring inaccessible to other than authorized personnel.
_____ (3) Temporary light bulb equipped with guards, use heavy duty cords, and not suspended by their cords unless specifically designed for that use.
_____ (4) Runs of open conductors located away from possible damage and fastened at intervals of no greater than 10 feet.
_____ (5) Outlets in construction sites have GFCI or assured equipment grounding.
_____ (6) Extension cords protected from damage. No worn or frayed cables. Not hung from nails or suspended by wire.
_____ (7) Fuses or circuit breaker provided for each feeder or branch circuit.
_____ (8) Electrical powered operated hand tools shall either be of the approved double insulated type or properly grounded.

I. DEMOLITION (OSHA 1926.850-858 and NFPA 241 – Ch.7)

_____ (1) Electric, gas water, steam, etc. shut off prior to work.
_____ (2) Any utilities that are necessary to be maintained need protection.
_____ (3) Masonry walls shall not be permitted to fall on floors such that it would exceed the safe carrying capacity of the floor.
_____ (4) Floor openings within 10 feet of any wall being demolished shall be planked solid except when no one below.
_____ (5) The storage of waste material and debris shall not exceed the floor loading limit.
_____ (6) Construction of dust barriers as needed (not OSHA).
_____ (7) Notification of shut off and protect smoke detectors, etc. during day time only (not OSHA). Coordinated with COTR.
_____ (8) Precautions if floors are soaked with oil or flammable liquids, if dust accumulation is present or other combustibles a present and hot work is being performed.
_____ (9) Smoking is prohibited throughout demolition (NFPA 241, 7-4, 2).
_____ (10) Flammable and combustible liquids removed from area.
_____ (11) Water supplies must still be available from fire hydrants in the vicinity of the structure or area.
_____ (12) Asbestos abatement, breakables (i.e., glass) shall be removed prior to demolition.

J. TEMPORARY BUILDINGS, TRAILERS (NFPA 241, Ch.2)

_____ (1) Temporary offices, trailers, sheds, etc. of combustible construction at least 30 feet from permanent buildings.
_____ (2) Only safety installed approved heating devices used. Ample clearance around stoves, heaters and chimneys per NFPA 211.

K. ROOFING OPERATIONS (NFPA 241, Ch.6)

_____ (1) Asphalt and tar kettles located outside the building or on a noncombustible roof away from combustibles. Kettles must have gravity lids, tight fitting.
_____ (2) Torch applied roofing systems shall be installed using extreme caution. Follow manufacturer's instructions. Caution around roof openings, penetrations or flashings.
_____ (3) Fire extinguisher, 20-B minimum, within 30 feet of roof kettle. At least one extinguisher 2A:20-B:C on the roof being repaired; also one within 30 feet of torch applied roofing equipment.
_____ (4) Fuel containers at least 10 feet away from burner flame.
_____ (5) Notify building occupants who might be affected. Coordinate with C.O.T.R.
_____ (6) Investigate location of supply air intakes. Coordinate shutdowns as necessary with COTR.
_____ (7) Roof edges will be guarded by means of typical roof protection or a safety monitoring system.

L. EXIT PATHWAYS (NFPA 241, Ch.5; also reference NFPA 101)

_____ (1) Every building and area will remain accessible to fire department apparatus and personnel. Roadways will be maintained with 20 feet of all buildings.
_____ (2) Adequate egress paths, including stairs and corridors, will be maintained at all times. Exits may only be blocked temporarily if unavoidable and when adequate alternate measures are provided(signage, temporary fire detection, training, etc.) to warn personnel. Coordinate with COTR.

WORK LOCATION _____

NOTIFIERS SIGNATURE & DATE _____

NAME & PHONE No. _____

CONTRACTOR
_____

COTR SIGNATURE & DATE _____

SECTION 01 14 00.05 20
WORK RESTRICTIONS FOR DESIGN-BUILD

ATTACHMENT 5A

CONTRACTOR WORK PLAN / PEER REVIEW REQUEST

PROJECT No. & TITLE: 673-XX-XXX, "XXXX"

DATE OF WORK: Sn,M,T,W,Th,F,St _____ **START TIME:** _____ AM/PM

END TIME:_____ AM/PM **ESTIMATED DURATION OF WORK:** _____ HOURS

LOCATION OF WORK:

_____

_____

DESCRIPTION OF WORK:

_____

_____

_____

_____

_____

TOOLS & EQUIPMENT TO PERFORM WORK:_____

_____

_____

PERSONNAL PROTECTIVE EQUIPMENT FOR WORK:_____

_____

_____

NAME(S) OF EMPLOYEE(S) PERFORMING WORK:

_____

_____

_____

_____

_____

SUPERVISOR / WORK LEADER SIGNATURE & DATE: _____

SUPERVISOR / WORK LEADER NAME (PRINTED): _____

PROCEEDURE(S): _____

_____

_____

All maintenance and repair work must have a written procedure prepared by the maintenance person performing the task.

Before:

During:

After:

DATE AND TIME COTR NOTIFIED:

GENERAL CONTRACTOR'S NOTIFYING PERSON:

NOTIFYING PERSON'S SIGNATURE:

GENERAL CONTRACTOR COMPANY:

_____

PHONE NUMBER(S):

_____

PEER REVIEW #5 - B

PROJECT No. & TITLE: 673-XX-XXX, "XXXX"

Name	Signature	Title / Service	Date
		COTR / FMS	
		Elec Supv / FMS	
		AC Supv / FMS	
		Plumb Supv / FMS	
		Controls / FMS	
		M&O Supv / FMS	
		Chief Project / FMS	
		Chief / FMS	

Check all that apply:

_____ Notification of Live Electrical Work

_____ Enclosed Space Permit

_____ Burn Permit (Hot Work)

_____ Safety Review (ILSM)

_____ Infection Controls Review (ICRA)

_____ Above Ceiling Permit

_____ Drawings Enclosed

_____ Mitigation Plan

_____ Contingency Plan

_____ Does the work require a Utility Shutdown?

_____ Is a Shutdown / Closure Coordination Meeting Required?

_____ Utility Shutdown / Closure Notice

_____ Utility Shutdown & Start Up Procedures

_____ Planned Utility Shutdown Checklist and Flow Chart

SECTION 01 14 00.05 20
WORK RESTRICTIONS FOR DESIGN-BUILD

Attachment 6 *With No Sensitive* but Require Training- VA Information and Information System Security/Privacy Language

VA INFORMATION AND INFORMATION SYSTEM SECURITY/PRIVACY LANGUAGE

VA INFORMATION CUSTODIAL LANGUAGE:

a. If VA determines that the contractor has violated any of the information confidentiality, privacy, and security provisions of the contract, it shall be sufficient grounds for VA to withhold payment to the contractor or third party or terminate the contract for default or terminate for cause under Federal Acquisition Regulation (FAR) part 12.

SECURITY INCIDENT INVESTIGATION:

a. The term "security incident" means an event that has, or could have, resulted in unauthorized access to, loss or damage to VA assets, or sensitive information, or an action that breaches VA security procedures. The contractor/subcontractor shall immediately notify the COTR and simultaneously, the designated ISO and Privacy Officer for the contract of any known or suspected security/privacy incidents, or any unauthorized disclosure of sensitive information, including that contained in system(s) to which the contractor/subcontractor has access.

b. To the extent known by the contractor/subcontractor, the contractor/subcontractor's notice to VA shall identify the information involved, the circumstances surrounding the incident (including to whom, how, when, and where the VA information or assets were placed at risk or compromised), and any other information that the contractor/subcontractor considers relevant.

c. With respect to unsecured protected health information, the business associate is deemed to have discovered a data breach when the business associate knew or should have known of a breach of such information. Upon discovery, the business associate must notify the covered entity of the breach. Notifications need to be made in accordance with the executed business associate agreement.

d. In instances of theft or break-in or other criminal activity, the contractor/subcontractor must concurrently report the incident to the appropriate law enforcement entity (or entities) of jurisdiction, including the VA OIG and Security and Law Enforcement. The contractor, its employees, and its subcontractors and their employees shall cooperate with VA and any law enforcement authority responsible for the investigation and prosecution of any possible criminal law violation(s) associated with any incident. The contractor/subcontractor shall cooperate with VA in any civil litigation to recover VA information, obtain monetary or other compensation from a third party for damages arising from any incident, or obtain injunctive relief against any third party arising from, or related to, the incident.

LIQUIDATED DAMAGES FOR DATA BREACH:

a. Consistent with the requirements of 38 U.S.C. §5725, a contract may require access to sensitive personal information. If so, the contractor is liable to VA for liquidated damages in the event of a data breach or privacy incident involving any SPI the contractor/subcontractor processes or maintains under this contract.

b. The contractor/subcontractor shall provide notice to VA of a "security incident" as set forth in the Security Incident Investigation section above. Upon such notification, VA must secure from a non-Department entity or the VA Office of Inspector General an independent risk analysis of the data breach to determine the level of risk associated with the data breach for the potential misuse of any sensitive personal information involved in the data breach. The term 'data breach' means the loss, theft, or other unauthorized access, or any access other than that incidental to the scope of employment, to data containing sensitive personal information, in electronic or printed form, that results in the potential compromise of the confidentiality or integrity of the data. Contractor shall fully cooperate with the entity performing the risk analysis. Failure to cooperate may be deemed a material breach and grounds for contract termination.

SECURITY CONTROLS COMPLIANCE TESTING :

On a periodic basis, VA, including the Office of Inspector General, reserves the right to evaluate any or all of the security controls and privacy practices implemented by the contractor under the clauses contained within the contract. With 10 working-day's notice, at the request of the government, the contractor must fully cooperate and assist in a government-sponsored security controls assessment at each location wherein VA information is processed or stored, or information systems are developed, operated, maintained, or used on behalf of VA, including those initiated by the Office of Inspector General. The government may conduct a security control assessment on shorter notice (to include unannounced assessments) as determined by VA in the event of a security incident or at any other time.

TRAINING:

a. All contractor employees and subcontractor employees requiring access to VA information and VA information systems shall complete VA Privacy and Information Security Awareness and Rules of Behavior Training.

(1) Sign and acknowledge (either manually or electronically) understanding of and responsibilities for compliance with the *Rules of Behavior.*

b. The contractor shall provide to the contracting officer and/or the COTR a copy of the training certificates and certification of signing the Rules of Behavior for each applicable employee within 1 week of the initiation of the contract and annually thereafter, as required.

c. Failure to complete the mandatory annual training and sign the Rules of Behavior annually, within the timeframe required, is grounds for suspension or termination of all physical or electronic access privileges and removal

from work on the contract until such time as the training and documents are complete.

The Certification and Accreditation (C&A) requirements do not apply and a Security Accreditation Package is not required for this SOW.

SECTION 01 81 11

SUSTAINABLE DESIGN REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

This Section describes general requirements and procedures to comply with the Guiding Principles for Leadership in High Performance and Sustainable Buildings Memorandum of Understanding incorporated in the Executive Orders 13423 and 13514; Energy Policy Act of 2005 (EPAct 2005) and the Energy Independence and Security Act of 2007 (EISA 2007). This Section includes the sustainable requirements for the Central Utility Plant (CUP) which has a goal to achieve a Leadership in Energy and Environmental Design (LEED) for New Construction (NC) version 2009 Silver certification.

Additional sustainable requirements (above and beyond what is listed in this Section) are included in Section 01 81 16 HEALTHCARE SUSTAINABLE DESIGN REQUIREMENTS for the Bed Tower which has a goal to achieve a LEED for Healthcare (LEED-HC) version 2009 Silver certification.

1.2 OBJECTIVES

A. To maximize resource efficiency and reduce the environmental impacts of construction and operation, the Contractor during the construction phase of this project shall implement the following procedures:

1. Select products that minimize consumption of energy, water and non-renewable resources, while minimizing the amounts of pollution resulting from the production and employment of building technologies. It is the intent of this project to conform with EPA's Five Guiding Principles on environmentally preferable purchasing. The five principles are:
   a. Include environmental considerations as part of the normal purchasing process.
   b. Emphasize pollution prevention early in the purchasing process.
   c. Examine multiple environmental attributes throughout a product's or service's life cycle.
   d. Compare relevant environmental impacts when selecting products and services.
   e. Collect and base purchasing decisions on accurate and meaningful information about environmental performance.

2. Control sources for potential Indoor Air Quality (IAQ) pollutants by controlled selection of materials and processes used in project construction in order to attain superior IAQ.
3. Products and processes that achieve the above objectives to the extent currently possible and practical have been selected and included in these Construction Documents. The Contractor is responsible to maintain and support these objectives in developing means and methods for performing the work of this Contract and in proposing product substitutions and/or changes to specified processes.
4. Use building practices that insure construction debris and particulates do not contaminate or enter duct work prior to system startup and turn over.

1.3 RELATED DOCUMENTS

A. Section 01 81 16 HEALTHCARE SUSTAINABLE DESIGN REQUIREMENTS
B. Section 01 74 19 CONSTRUCTION WASTE MANANGEMENT
C. Section 01 81 21 INDOOR AIR QUALITY MANAGEMENT (IAQ) DURING CONSTRUCTION
D. Section 01 81 22 INDOOR AIR QUALITY PROTECTION BEFORE OCCUPANCY
C. Section 01 91 15 BUILDING ENCLOSURE COMMISSIONING REQUIREMENTS
D. Section 01 91 17 BUILDING ENCLOSURE FUNCTIONAL PERFORMANCE TEST PROTOCOL
E. Section 01 91 13 GENERAL COMMISSIONING REQUIREMENTS

1.4 DEFINITIONS

A. Agrifiber Products: Composite panel products derived from agricultural fiber
B. Biobased Product: As defined in the 2002 Farm Bill, a product determined by the Secretary to be a commercial or industrial product (other than food or feed) that is composed, in whole or in significant part, of biological products or renewable domestic agricultural materials (including plant, animal, and marine materials) or forestry materials
C. Biobased Content: The weight of the biobased material divided by the total weight of the product and expressed as a percentage by weight
D. Certificates of Chain-of-Custody: Certificates signed by manufacturers certifying that wood used to make products has been tracked through its extraction and fabrication to ensure that is was obtained from forests certified by a specified certification program

E. Certified Wood: Wood based materials and products certified in accordance with Forest Stewardship Council's (FSC) Principles and Criteria for wood building components.
F. Composite Wood: A product consisting of wood fiber or other plant particles bonded together by a resin or binder
G. Construction and Demolition Waste: Includes solid wastes, such as building materials, packaging, rubbish, debris, and rubble resulting from construction, remodeling, repair and demolition operations. A construction waste management plan is to be provided by the Contractor as defined in Section 01 74 19.
H. EA: Energy and Atmosphere
I. GBCI: Green Building Certification Institute
J. ID: Innovation in Design
K. IEQ: Indoor Environmental Quality
L. LEED: Leadership in Energy and Design
M. Light Pollution: Light that extends beyond its source such that the additional light is wasted in an unwanted area or in an area where it inhibits view of the night sky
N. MR: Materials and Resources
O. Recycled Content Materials: Products that contain pre-consumer or post-consumer materials as all or part of their feedstock
P. Post-Consumer Recycled Content: The percentage by weight of constituent materials that have been recovered or otherwise diverted from the solid-waste stream after consumer use
Q. Pre-Consumer Recycled Content: Materials that have been recovered or otherwise diverted from the solid-waste stream during the manufacturing process. Pre-consumer content must be material that would not have otherwise entered the waste stream as per Section 5 of the FTC Act, Part 260 "Guidelines for the Use of Environmental Marketing Claims": www.ftc.gov/bcp/grnrule/guides980427
R. Rapidly Renewable Materials: Materials and products made from plants typically harvested within ten (10) year, short cycle, or bi-product of an animal producing material on an on-going basis.
S. Regional Materials: Materials that are extracted, harvested, recovered, and manufactured within a radius of 250 miles (400 km) from the Project site

T. Salvaged or Reused Materials: Materials extracted from existing buildings in order to be reused in other buildings without being manufactured

U. Sealant: Any material that fills and seals gaps between other materials

V. SS: Sustainable Sites

W. Third Party Certification: Certification of levels of environmental achievement by nationally recognized sustainability rating system.

X. Type 1 Finishes: Materials and finishes which have a potential for short-term levels of off gassing from chemicals inherent in their manufacturing process, or which are applied in a form requiring vehicles or carriers for spreading which release a high level of particulate matter in the process of installation and/or curing.

Y. Type 2 Finishes: "Fuzzy" materials and finishes which are woven, fibrous, or porous in nature and tend to adsorb chemicals off gas

Z. USGBC: United States Green Building Council

AA. Volatile Organic Compounds (VOCs): Any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, which participates in atmospheric photochemical reactions. Compounds that have negligible photochemical reactivity, listed in EPA 40 CFR 51.100(s), are also excluded from this regulatory definition.

BB. WE: Water Efficiency

1.5 SUBMITTALS

A. LEED Action Plans:

1. Submit the following LEED Action Plans within 30 days of Notice to Proceed:
   a. LEED Action Plan - Construction Waste Management
   b. LEED Action Plan - Recycled Content
   c. LEED Action Plan - Regional Materials
   d. LEED Action Plan - Rapidly Renewable Materials
   e. LEED Action Plan - Certified Wood
   f. LEED Action Plan - Indoor Air Quality During Construction
   g. LEED Action Plan - Indoor Air Quality Before Occupancy
2. LEED Action Plans shall contain the following information:
   a) Project Materials Cost Data:
   b) Provide statement indicating total cost for materials used for project costs.
   c) Exclude labor, overhead, and profit.

d) Provide detailed description of activities related to accomplishing LEED project requirements, including construction practices, procurement practices, and proposed submittals and documentation for each LEED credit for which Contractor is responsible.

e) Name of individual responsible for ensuring Prerequisites and/or Credits are earned and assembling and uploading documentation.

B. Sustainable Design Submittals (also used for documentation of LEED Credits):

1. Construction Activity Pollution Prevention Plan (also referred to as the Stormwater Pollution Prevention Plan).

1. Alternative Transportation: Provide manufacturer's cut sheets for all bike racks installed on site, including the total number of bicycle storage slots provided. Also, provide manufacturer's cut sheets for any alternative-fuel refueling stations installed on site, including fueling capacity information for an 8-hour period.

2. Heat Island Effect:

a. Site Paving: Provide manufacturer's cut sheets for all impervious paving materials, highlighting the Solar Reflectance Index (SRI) of the material. Also, provide cut sheets for all pervious paving materials.

b. Roofing Materials: Submittals for roofing materials must include manufacturer's cut sheets or product data highlighting the Solar Reflectance Index (SRI) of the material.

3. Exterior Lighting Fixtures: Submittals must include cut sheets with manufacturer's data on initial fixture lumens above 90° from nadir for all exterior lighting fixtures, and, for parking lot lighting, verification that the fixtures are classified by the IESNA as "full cutoff" (FCO); OR provide documentation that exterior luminaires are IDA-Approved as Dark-Sky Friendly by the International Dark Sky Association (IDA) Fixture Seal of Approval Program.

4. Irrigation Systems: Provide manufacturer's cut sheets for all permanent landscape irrigation system components and for any rainwater harvesting system components, such as cisterns.

5. Water Conserving Fixtures: Submittals must include manufacturer's cut sheets for all water-consuming plumbing fixtures and fittings (toilets, urinals, faucets, showerheads, etc.) highlighting maximum

flow rates and/or flush rates. Include cut sheets for any automatic faucet-control devices.

6. Process Water Use: Provide manufacturer's cut sheets for all water-consuming commercial equipment (clothes washers, dishwashers, ice machines, etc.), highlighting water consumption performance. Include manufacturer's cut sheets or product data for any cooling towers, highlighting water consumption estimates, water use reduction measures, and corrosion inhibitors.
7. Elimination of CFCs AND HCFCs: Provide manufacturer's cut sheets for all cooling equipment with manufacturer's product data, highlighting refrigerants; provide manufacturer's cut sheets for all fire-suppression equipment, highlighting fire-suppression agents; provide manufacturer's cut-sheets for all polystyrene insulation (XPS) and closed-cell spray foam polyurethane insulation, highlighting the blowing agent(s).
8. Appliances and Equipment: Provide copies of manufacturer's product data for all Energy Star eligible equipment and appliances, including office equipment, computers and printers, electronics, and commercial food service equipment (excluding HVAC and lighting components), verifying compliance with EPA's Energy Star program.
9. On-Site Renewable Energy Systems: Provide cut sheets and manufacturer's product data for all on-site renewable energy generating components and equipment, including documentation of output capacity.
10. Measurement and Verification Systems: Provide cut sheets and manufacturer's product data for all controls systems, highlighting electrical metering and trending capability components.
11. Salvaged or Reused Materials: Provide documentation that lists each salvaged or reused material, the source or vendor of the material, the purchase price, and the replacement cost if greater than the purchase price.
12. Recycled Content: Submittals for all materials with recycled content (excluding MEP systems equipment and components) must include the following documentation: Manufacturer's product data, product literature, or a letter from the manufacturer verifying the percentage of post-consumer and pre-consumer recycled content (by weight) of each material or product

a. An electronic spreadsheet that tabulates the Project's total materials cost and combined recycled content value (defined as the sum of the post-consumer recycled content value plus one-half of the pre-consumer recycled content value) expressed as a percentage of total materials cost. This spreadsheet shall be submitted every third month with the Contractor's Certificate and Application for Payment. It should indicate, on an ongoing basis, line items for each material, including cost, pre-consumer recycled content, post-consumer recycled content, and combined recycled content value.

13. Regional Materials: Submittals for all products or materials expected to contribute to the regional calculation (excluding MEP systems equipment and components) must include the following documentation:
    a. Cost of each material or product, excluding cost of labor and equipment for installation
    b. Location of product manufacture and distance from point of manufacture to the Project Site
    c. Location of point of extraction, harvest, or recovery for each raw material in each product and distance from the point of extraction, harvest, or recovery to the Project Site
    d. Manufacturer's product data, product literature, or a letter from the manufacturer verifying the location and distance from the Project Site to the point of manufacture for each regional material
    e. Manufacturer's product data, product literature, or a letter from the manufacturer verifying the location and distance from the Project Site to the point of extraction, harvest, or recovery for each regional material or product, including, at a minimum, gravel and fill, planting materials, concrete, masonry, and GWB
    f. An electronic spreadsheet that tabulates the Project's total materials cost and regional materials value, expressed as a percentage of total materials cost. This spreadsheet shall be submitted every third month with the Contractor's Certificate and Application for Payment. It should indicate on an ongoing basis, line items for each material, including cost, location of manufacture, distance from manufacturing plant to the Project

Site, location of raw material extraction, and distance from extraction point to the Project Site.

14. Certified Wood: Provide vendor invoices that includes the FSC CoC, how the products are classified (e.g. "FSC Pure", "FSC Mixed [NN]" percent, or "FSC Mixed Credit") and material cost on a line-by-line basis.
15. Outdoor Air Delivery Monitoring: Provide manufacturer's cut sheets highlighting the installed carbon dioxide monitoring system components and sequence of controls shop drawing documentation, including CO2 differential set-points and alarm capabilities.
16. Interior Adhesives and Sealants: Submittals for all field-applied adhesives and sealants, which have a potential impact on indoor air, must include manufacturer's MSDSs or other Product Data highlighting VOC content.
    a. Provide manufacturers' documentation verifying all adhesives used to apply laminates, whether shop-applied or field-applied, contain no urea-formaldehyde.
17. Interior Paints and Coatings: Submittals for all field-applied paints and coatings, which have a potential impact on indoor air, must include manufacturer's MSDSs or other Product Data highlighting VOC content
18. Exterior Paints and Coatings: Submittals for all field-applied paints and coatings, which have a potential impact on ambient air quality, must include manufacturer's MSDSs or other manufacturer's Product Data highlighting VOC content.
19. Floorcoverings:
    a. Carpet Systems: Submittals for all carpet must include the following:
        1) A copy of an assessment from the Building for Environmental and Economic Sustainability (BEES) software model, either Version 3.0 or 4.0, with parameters of the model set as described by this specification section.

        2) Manufacturer's product data verifying that all carpet systems meet or exceed the testing and product requirements of the Carpet and Rug Institute Green Label Plus program.

b. Engineered Wood Flooring: Submittals for all engineered wood flooring must include manufacturer's product data verifying certification under either the Greenguard or FloorScore indoor emissions testing program.

20. Composite Wood and Agrifiber Binders: Submittals for all composite wood and agrifiber products (including but not limited to particleboard, wheatboard, strawboard, agriboard products, engineered wood components, solid-core wood doors, OSB, MDF, and plywood products) must include manufacturer's product data verifying that these products contain no urea-formaldehyde resins.
21. Systems Furniture and Seating: Provide manufacturer's product data verifying that all systems furniture and seating products meet the requirements of one of the following:
    a. Greenguard certification
    b. SCS Indoor Advantage certification
    c. SCS Indoor Advantage Gold certification
    d. BIFMA Standard X7.1-2005, as tested to BIFMA method M7.1-2005 and as verified by an independent laboratory
    d. Calculated indoor air concentration limits for furniture systems and seating determined by the U.S. EPA's Environmental Technology Verification Large Chamber Test Protocol for Measuring Emissions of VOCs and Aldehydes (September 1999) testing protocol as conducted in an independent air quality testing laboratory
22. Entryway Systems: Provide manufacturer's cut sheets for all walk-off systems installed to capture particulates, including permanently installed grates, grilles, slotted systems, direct glue-down walk-off mats, and non-permanent roll-out mats.
23. Air Filtration: Provide manufacturer's cut sheets and product data highlighting the following:
    a. Minimum Efficiency Reporting Value (MERV) for filtration media in all air handling units (AHUs) per ASHRAE HVAC Design Manual for Hospitals and Clinics.
    b. Minimum Efficiency Reporting Value (MERV) for filtration media installed at return air grilles during construction if permanently installed AHUs are used during construction. See above for requirements
24. Mercury in Lighting: Provide manufacturer's cut sheets or product data for all fluorescent or HID lamps highlighting mercury content.

25. Lighting Controls: Provide manufacturer's cut sheets and shop drawing documentation highlighting all lighting controls systems components.
26. Thermal Comfort Controls: Provide manufacturer's cut sheets and shop drawing documentation highlighting all thermal comfort-control systems components.
27. Blended Cement: It is the intent of this specification to reduce CO_2 emissions and other environmentally detrimental effects resulting from the production of portland cement by requiring that all concrete mixes, in aggregate, utilize blended cement mixes to displace portland cement as specified in Section 03 30 00, CONCRETE typically included in conventional construction. Provide the following submittals:
    a. Copies of concrete design mixes for all installed concrete
    b. Copies of typical regional baseline concrete design mixes for all compressive strengths used on the Project
    c. Quantities in cubic yards of each installed concrete mix
28. Gypsum Wall Board: Provide manufacturer's cut sheets or product data verifying that all gypsum wallboard products are moisture and mold-resistant.
29. Fiberglass Insulation: Provide manufacturer's cut sheets or product data verifying that fiberglass batt insulation contains no urea-formaldehyde.
30. Green Housekeeping: Provide documentation that all cleaning products and janitorial paper products meet the VOC limits and content requirements of this specification section.

B. Project Materials Cost Data: Provide a spreadsheet in an electronic file indicating the total cost for the Project and the total cost of building materials used for the Project, as follows:
    1. Not more than 60 days after the Preconstruction Meeting, the General Contractor shall provide to the Owner and Architect a preliminary schedule of materials costs for all materials used for the Project organized by specification section. Exclude labor costs and all mechanical, electrical, and plumbing (MEP) systems materials and labor costs. Include the following:
        a. Identify each reused or salvaged material, its cost, and its replacement value.

b. Identify each recycled-content material, its post-consumer and pre-consumer recycled content as a percentage the product's weight, its cost, its combined recycled content value (defined as the sum of the post-consumer recycled content value plus one-half of the pre-consumer recycled content value), and the total combined recycled content value for all materials as a percentage of total materials costs.
c. Identify each regional material, its cost, its manufacturing location, the distance of this location from the Project site, the source location for each raw material component of the material, the distance of these extraction locations from the Project site, and the total value of regional materials as a percentage of total materials costs.
d. Identify each bio-based material, its source, its cost, and the total value of bio-based materials as a percentage of total materials costs. Also provide the total value of rapidly renewable materials (materials made from plants that are harvested in less than a 10-year cycle) as a percentage of total materials costs.
e. Identify each wood-based material, its cost, the total wood-based materials cost, each FSC Certified wood material, its cost, and the total value of Certified wood as a percentage of total wood-based materials costs.

2. Provide final versions of the Project Materials Cost Data to the Owner and Architect not more than 14 days after Substantial Completion.

C. Construction Waste Management: See Section 01 74 19 CONSTRUCTION WASTE MANAGEMENT for submittal requirements.

D. Construction Indoor Air Quality (IAQ) Management: See Section 01 81 21 INDOOR AIR QUALITY MANAGEMENT (IAQ) DURING CONSTRUCTION and Section 01 81 22 INDOOR AIR QUALITY PROTECTION BEFORE OCCUPANCY for submittal requirements.

E. Commissioning: See Section 01 91 00 GENERAL COMMISSIONING REQUIREMENTS for submittal requirements.

F. Sustainable Design Progress Reports: Concurrent with each Application for Payment, submit reports for the following comparing actual construction and purchasing activities with environmental action plans for following:

1. Waste reduction progress reports complying with Section 01 74 19 - Construction Waste Management.
2. Recycled Content.
3. Regional Materials.
4. Rapidly Renewable Materials.
5. Certified Wood.

G. LEED Information:

1. Sustainable Sites:
    a. SS Prerequisite 1: Construction Activity Pollution Prevention Plan.
    b. SS Credit 7.1: Product data indicating SRI of hardscape materials.
    c. SS Credit 7.2: Product data indicating SRI of finished roof material.
2. Materials and Resources:
    a. MR Credit 2: Comply with requirements of Section 01 74 19 - Construction Waste Management.
    b. MR Credit 3: Monthly summary reports showing progress toward meeting salvaged/reused material requirement.
    c. MR Credit 4: Monthly summary reports showing progress toward meeting recycled content requirement.
    d. MR Credit 5: Monthly summary reports showing progress toward meeting regional content requirement.
    e. MR Credit 6: Monthly summary reports showing progress toward meeting rapidly renewable materials content requirement.
    f. MR Credit 7: Monthly summary reports showing progress toward meeting certified wood requirement.
3. Indoor Environmental Quality:
    a. IEQ Credit 3.1: Comply with requirements in Section 01 81 21 - Indoor Air Quality Management (IAQ) During Construction
    b. IEQ Credit 3.2: Comply with requirements in Section 01 81 22 - Indoor Air Quality Protection Before Occupancy
    c. IEQ Credit 4.1: Product data indicating VOC content for adhesives and sealants applied inside weatherproofing barrier and applied on-site.

d. IEQ Credit 4.2: Product data indicating VOC content for paints and coatings applied inside weatherproofing barrier and applied on-site.
e. IEQ Credit 4.3: Product data indicating compliance with referenced requirements for flooring systems and flooring adhesives.
f. IEQ Credit 4.4: Product data indicating composite wood and agrifiber products used inside weatherproofing barrier contain no added urea-formaldehyde resin. Laminating adhesives used to fabricate on-site and shop-applied composite wood and agrifiber assemblies shall not contain added urea-formaldehyde resins.

1.6 QUALITY ASSURANCE

A. Preconstruction Meeting: After award of Contract and prior to the commencement of the Work, schedule and conduct meeting with Owner, Architect, and all Subcontractors to discuss the Construction Waste Management Plan, the required Construction Indoor Air Quality (IAQ) Management Plan, and all other Sustainable Design Requirements. The purpose of this meeting is to develop a mutual understanding of the Project's Sustainable Design Requirements and coordination of the Contractor's management of these requirements with the Contracting Officer and the Construction Quality Manager.
B. Construction Job Conferences: The status of compliance with the Sustainable Design Requirements of these specifications will be an agenda item at all regular job meetings conducted during the course of work at the site.

1.7 CONTRACTOR RESPONSIBILITIES

A. Sustainable Design Project Management and Coordination:
   1. Prior to Preconstruction Conference, identify and assign one person on Contractor's staff to be LEED Project Manager responsible for LEED issues, compliance and coordination.
   2. Qualifications:
      a. Similar responsibilities and performance for a minimum of two (2) LEED construction projects.
      b. LEED AP with applicable specialization.
   3. Responsibilities:

a. Review Contract Documents for LEED issues, coordinate work of trades, subcontractors, and suppliers; instruct workers relating to LEED issues; and oversee Project LEED Goals.
b. Assemble and retain electronic copies of approved LEED Submittals, tabulation charts and other records to document progress toward meeting LEED requirements.
c. Provide records in secure jobsite location, available for review by Architect or Owner.
d. Provide Action Plans, Progress Reports and final documentation according to specified requirements and schedule.
e. Assist Architect and Owner in preparation of submission to GBCI.

B. LEED Records:

1. Maintain comprehensive LEED file electronically with verification documentation for each LEED construction credit for which responsible.
   a. Organize files to allow easy access to information and make available upon request.
   b. Include LEED Credit Checklist in file, applicable product data for material selection, final calculations, certifications for construction practices, procurement data, cumulative calculations and other items as identified in approved LEED Action Plans.
   c. Include required data to support full compliance with the LEED construction credits being pursued in file, in addition to data required to support compliance with LEED design credits as applicable.
   d. Include submittals for each construction credit attempted in event clarification is required by GBCI per LEED record requirements.
      1) SS Prerequisite 1: Approved E&S plan.
      2) SS Credit 5.2: Verification of compliance.
      3) SS Credit 7.1: Hardscape SRI data.
      4) SS Credit 7.2: Roofing material SRI data.
      5) MR Credit 2: Construction waste records per 01 74 19.
      7) MR Credit 4: Verification material.
      8) MR Credit 5: Verification material.
      9) MR Credit 6: Verification material.
      10) MR Credit 7: Verification material.

11) IEQ Credit 3.1: Comply with requirements in Section 01 81 21 INDOOR AIR QUALITY MANAGEMENT (IAQ) DURING CONSTRUCTION
12) IEQ Credit 3.2: Comply with requirements in Section 01 81 22 INDOOR AIR QUALITY PROTECTION BEFORE OCCUPANCY
11) IEQ Credit 4.1: Product data showing compliance.
12) IEQ Credit 4.2: Product data showing compliance.
13) IEQ Credit 4.3: Product data showing compliance.
14) IEQ Credit 4.4: Product data showing compliance.

e. File is to contain information current through previous month's work.
f. File is to be made available to Owner or Architect upon request throughout duration of project.

1.8 LEED CALCULATIONS

A. Incorporate and document LEED credits as identified in LEED credit checklist as required by Contract Documents and in compliance with applicable LEED Reference Guide.
1. LEED credits not identified elsewhere in the Contract documents and those requiring further instruction are specified below.
2. Refer to applicable LEED Reference Guide for additional definitions and requirements.

PART 2 - PRODUCTS

2.1 PRODUCT ENVIRONMENTAL REQUIREMENTS

A. Roofing Materials: All roofing systems, other than vegetated roof systems, must comply with the following requirements:
1. Low-Sloped roofing less than or equal to 2:12 slope must have an SRI of at least 78.
2. Steep-Sloped roofing greater than 2:12 slope must have an SRI of at least 29.
3. Roofing Materials: Light-colored, reflective, and high-emissivity roofing helps to reduce localized heat build-up from roof surfaces that contribute to the urban heat island effect.

B. Exterior Lighting Fixtures:
1. All exterior luminaires must emit 0% of the total initial designed fixture lumens at an angle above 90° from nadir and/or meet the requirements of the Dark Sky certification program.
2. Exterior lighting cannot exceed 80% of the lighting power densities defined by ASHRAE/IESNA Standard 90.1-2004, Exterior Lighting Section, without amendments.

3. No lighting of building facades or landscape features is permitted.

C. Herbicides and Pest Control: Herbicides shall not be permitted, and pest control measures shall utilize EPA-registered biopesticides only.

D. Landscape Irrigation: Use water-efficient landscape and irrigation strategies, including water reuse and recycling, to reduce outdoor potable water consumption by a minimum of 50 percent over that consumed by conventional means (plant species and plant densities).

E. Water-Conserving Fixtures: Plumbing fixtures and fittings shall use in aggregate at least 20% less water than the water use baseline calculated for the building after meeting the Energy Policy Act of 1992 fixture performance requirements. Flow and flush rates shall not exceed the following:

1. Toilets: no more than 1.28 gallons per flush, otherwise be dual flush 1.6/0.8 gallons per flush, and have documented bowl evacuation capability per MaP testing of at least 400 grams
2. Urinals: Waterless or Water sense rated with no more than 0.125 gallons per flush.
3. Lavatory Faucets: 0.5 gpm with automatic faucet controls
4. Kitchen Sink Lavatories: 1.5 gpm
5. Showerheads: no more than 1.5 gpm

F. Process Water Use: Employ strategies that in aggregate result in 20% less water use than the process water use baseline for the building after meeting the commercial equipment and HVAC performance requirements as listed below. For equipment not addressed by EPACT 2005 or the list below, additional equipment performance requirements may be proposed provided documentation supporting the proposed benchmark or industry standard is submitted.

1. Clothes Washer: 7.5 gallons/cubic foot/cycle
2. Dishwasher with Racks: 1.0 gallons/rack
3. Ice Machine: 20 gallons/100 pounds ice for machines making over 175 pounds of ice per day; 30 gallons/100 pounds ice for machines making less than 175 ice per day. Avoid water-cooled machines.
4. Food Steamer: 2 gallons/hour. Use only boilerless steamers.
5. Pre-Rinse Spray Valves: 1.4 gallons/minute
6. Kitchen Pot-Washing Sinks: 2.2 gallons/minute
7. Cooling Towers: 2.3 gallons/ton-hr. water loss

G. Elimination of CFCs AND HCFCs:

1. Ozone Protection and Greenhouse Gas Reduction: Base building cooling equipment shall contain no refrigerants other than the following: HCFC-123, HFC-134a, HFC-245fa, HFC-407c, or HFC 410a.
2. Fire suppression systems may not contain ozone-depleting substances such as halon 1301 and 1211.
3. Extruded polystyrene insulation (XPS) and closed-cell spray foam polyurethane insulation shall not be manufactured with hydrochlorofluorocarbon (HCFC) blowing agents.

H. Appliances and Equipment: All materials and equipment being installed that falls under the Energy Star or FEMP programs must be Energy Star or FEMP-rated. Eligible equipment includes refrigerators, motors, laundry equipment, office equipment and more. Refer to each program's website for a complete list.

I. HVAC Distribution Efficiency:
1. All duct systems shall be constructed of aluminum, stainless steel or galvanized sheet metal, as deemed appropriate based on the application requirements. No fiberglass duct board shall be permitted.
2. All medium- and high-pressure ductwork systems shall be pressure-tested in accordance with the current SMACNA standards.
3. All ductwork shall be externally insulated. No interior duct liner shall be permitted.
4. Where possible, all air terminal connections shall be hard-connected with sheet metal ductwork. If flexible ductwork is used, no flexible duct extension shall be more than six feet in length.
5. All HVAC equipment shall be isolated from the ductwork system with flexible duct connectors to minimize the transmittance of vibration.
6. All supply and return air branch ducts shall include the appropriate style of volume damper. Air terminal devices such as grilles, registers, and diffusers shall be balanced at duct branch dampers, not at terminal face.

J. Measurement and Verification: Install controls and monitoring devices as required by MEP divisions order to comply with International Performance Measurement & Verification Protocol (IPMVP), Volume III: Concepts and Options for Determining Energy Savings in New Construction, April 2003, Option D.
1. The IPMVP provides guidance on situation-appropriate application of measurement and verification strategies.

K. Salvaged or Reused materials: There shall be no substitutions for specified salvaged and reused materials and products.
   1. Salvaged materials: Use of salvaged materials reduces impacts of disposal and manufacturing of replacements.

L. Recycled Content of Materials:
   1. Provide building materials with recycled content such that post-consumer recycled content value plus half the pre-consumer recycled content value constitutes a minimum of 30% of the cost of materials used for the Project, exclusive of all MEP equipment, labor, and delivery costs. The Contractor shall make all attempts to maximize the procurement of materials with recycled content.
      a. Post-consumer recycled content value of a material shall be determined by dividing the weight of post-consumer recycled content by the total weight of the material and multiplying by the cost of the material.
      b. Do not include mechanical and electrical components in the calculations.
      c. Do not include labor and delivery costs in the calculations.
      d. Recycled content of materials shall be defined according to the Federal Trade Commission's "Guide for the Use of Environmental Marketing Claims," 16 CFR 260.7 (e).
      e. Utilize all on-site existing paving materials that are scheduled for demolition as granulated fill, and include the cost of this material had it been purchased in the calculations for recycled content value.
      f. The materials in the following list must contain the minimum recycled content indicated:

Category	**Minimum Recycled Content**
Compost/mulch	100% post-consumer
Asphaltic Concrete Paving	25% post-consumer
Cast-in-Place Concrete	6% pre-consumer
CMU: Gray Block	20% pre-consumer
Steel Reinforcing Bars	90% combined
Structural Steel Shapes	90% combined
Steel Joists	75% combined

Steel Deck	75% combined
Steel Fabrications	60% combined
Steel Studs	30% combined
Steel Roofing	30% post-consumer
Aluminum Fabrications	35% combined
Rigid Insulation	20% pre-consumer
Batt insulation	30% combined

M. Regional Materials:
   1. Document materials to indicate minimum of 10 percent, by dollar value, of materials and products for project are extracted, harvested or recovered, and manufactured, within five-hundred (500) mile radius of project site.

N. Rapidly Renewable Materials:
   1. Document materials to indicate minimum of 5 percent, by dollar value, of materials and products for project are bio-based in nature and harvested within a ten (10) year or shorter cycle.

O. Certified Wood:
   1. Document materials to indicate percentage, by dollar value, of permanently installed virgin wood-based materials and products for project are certified in accordance with FSC STD 40-004 V2-1.
   2. Minimum of 50 percent is required.
   3. Determine amount of FSC-certified project materials by method described in applicable LEED Reference Guide.
   4. Vendor invoices for permanently-installed wood products, both FSC certified and not, purchased by project contractor and subcontractors shall be compiled.
      a. Total cost of wood products, both FSC certified and not, on appropriate LEED document, e.g., MRc7 template.
      b. Wood products not FSC certified and those identified on invoices as "FSC Pure" and "FSC Mixed Credit" shall be valued at 100 percent of product cost.
      c. Value wood products identified as "FSC Mixed [NN] percent" at indicated percentage of their cost, e.g.,

d. Value products identified as "FSC Mixed 75 percent," at 75 percent of cost.

e. Wood products identified as "FSC Recycled" or "FSC Recycled Credit" qualify only as recycled content products.

5. Each vendor invoice must conform to following requirements:

a. Identify each wood product on a line-item basis;

b. Identify FSC products as such on a line-item basis;

c. Show dollar value of each line item;

d. Show vendor's COC certificate number on invoices including FSC products.

1) Each wood product vendor that invoices FSC certified products shall be COC certified by FSC accredited certifier.

e. Wood-based materials include, but not limited to, following materials when made from wood, engineered wood products, or wood-based panel products:

1) Rough carpentry.

2) Miscellaneous carpentry.

3) Heavy timber construction.

4) Wood decking.

5) Metal-plate-connected wood trusses.

6) Structural glued-laminated timber.

7) Finish carpentry.

8) Architectural woodwork.

9) Wood paneling.

10) Wood veneer wall covering.

11) Wood flooring.

12) Wood lockers.

13) Wood cabinets.

P. Biobased Content:

1. For products designated by the USDA's BioPreferred program, provide products that meet or exceed USDA recommendations for biobased content, so long as products meet all other performance requirements in VA master specifications. For more information regarding the product categories covered by the BioPreferred program, visit http://www.biopreferred.gov

Q. Adhesives and Sealants: For applications inside weatherproofing system and applied onsite, adhesives and sealants, comply with following VOC content limits as adopted by SCAQMD Rule #1168.

1. Wood Glues: 30 g/L.
2. Metal-to-Metal Adhesives: 30 g/L.
3. Adhesives for Porous Materials (Except Wood): 50 g/L.
4. Subfloor Adhesives: 50 g/L.
5. Plastic Foam Adhesives: 50 g/L.
6. Carpet Adhesives: 50 g/L.
7. Carpet Pad Adhesives: 50 g/L.
8. VCT and Asphalt Tile Adhesives: 50 g/L.
9. Cove Base Adhesives: 50 g/L.
10. Gypsum Board and Panel Adhesives: 50 g/L.
11. Rubber Floor Adhesives: 60 g/L.
12. Ceramic Tile Adhesives: 65 g/L.
13. Multipurpose Construction Adhesives: 70 g/L.
14. Fiberglass Adhesives: 80 g/L.
15. Contact Adhesive: 80 g/L.
16. Structural Glazing Adhesives: 100 g/L.
17. Wood Flooring Adhesive: 100 g/L.
18. Structural Wood Member Adhesive: 140 g/L.
19. Single-Ply Roof Membrane Adhesive: 250 g/L.
20. Special-Purpose Contact Adhesive (Contact adhesive used to bond melamine-covered board, metal, unsupported vinyl, rubber, or wood veneer 1/16 IN or less in thickness to surface): 250 g/L.
21. Top and Trim Adhesive: 250 g/L.
22. Plastic Cement Welding Compounds: 250 g/L.
23. ABS Welding Compounds: 325 g/L.
24. CPVC Welding Compounds: 490 g/L.
25. PVC Welding Compounds: 510 g/L.
26. Adhesive Primer for Plastic: 550 g/L.
27. Sheet-Applied Rubber Lining Adhesive: 850 g/L.
28. Aerosol Adhesive, General-Purpose Mist Spray: 65 percent by weight.
29. Aerosol Adhesive, General-Purpose Web Spray: 55 percent by weight.
30. Special-Purpose Aerosol Adhesive: 70 percent by weight.
31. Other Adhesives: 250 g/L.

32. Architectural Sealants: 250 g/L.
33. Non-membrane Roof Sealants: 300 g/L.
34. Single-Ply Roof Membrane Sealants: 450 g/L.
35. Other Sealants: 420 g/L.
36. Sealant Primers for Nonporous Substrates: 250 g/L.
37. Sealant Primers for Porous Substrates: 775 g/L.
38. Modified Bituminous Sealant Primers: 500 g/L.
39. Other Sealant Primers: 750 g/L.

R. Paints and Coatings: For applications inside weatherproofing system and applied onsite, paints and coatings shall comply with following VOC content limits as adopted by Green Seal GS-11, Green Seal GC-03 and SCAQMD Rule 1113.
1. Flat Paints and Coatings: 50 g/L.
2. Nonflat Paints and Coatings: 150 g/L.
3. Primers, Sealers, and Undercoaters: 200 g/L.
4. Anticorrosive and Antirust Paints: 250 g/L.
5. Pretreatment Wash Primers: 420 g/L.
6. Clear Wood Finishes, Varnishes: 350 g/L.
7. Clear Wood Finishes, Lacquers: 550 g/L.
8. Clear Wood Finishes, Sanding Sealers: 350 g/L.
9. Clear Brushing Lacquer: 680 g/L.
10. Floor Coatings: 100 g/L.
11. Shellacs, Clear: 730 g/L.
12. Shellacs, Pigmented: 550 g/L.
13. Stains: 250 g/L.
14. Concrete Curing Compounds: 350 g/L.
15. Japans/ Faux Finishing Coatings: 350 g/L.
16. Magnesite Cement Coatings: 450 g/L.
17. Pigmented Lacquer: 550 g/L.
18. Waterproofing Sealers: 250 g/L.
19. Waterproofing Concrete/ Masonry Sealers: 400 g/L.
20. Wood Preservatives: 350 g/L.
21. Low-Solids Coatings: 120 g/L.

S. Flooring Systems: Flooring shall comply with one of following as applicable to the project scope:
1. Option 1:
   a. Meets the testing and product requirements of the Carpet and Rug Institute Green Label Plus program.

b. Maximum VOC concentrations are less than or equal to those specified in California Department of Health Services Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers, including 2004 Addenda, using the office scenario as defined in Table 7.5 within the practice. Meet additional VOC concentration limits listed in Section 9.1.
c. Maximum VOC concentrations meet the California requirements specified above based on the California Department of Public Health (CDPH) Standard Method V1.1-2010 using test results obtained at the 14 day time point.
d. Carpet cushion installed in the building interior shall meet the requirements of the Carpet and Rug Institute Green Label program.
e. Carpet adhesive shall meet the requirements of IEQ Credit 4.1: Adhesives and Sealants, which includes a volatile organic compound (VOC) limit of 50 g/L (0.4 lb/gal).
f. Hard surface flooring installed in building interior shall meet one of following requirements:
    1) Meet the requirements of the FloorScore standard, current as of date of rating system, or more stringent version, as shown with testing by independent third-party.
    2) Demonstrate maximum VOC concentrations less than or equal to those specified in the California Department of Health Services Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers, including 2004 Addenda, using office scenario as defined in Table 7.5 within the practice.
    3) Maximum VOC concentrations meet California requirements specified above based on California Department of Public Health (CDPH) Standard Method V1.1-2010 using test results obtained at 14 day time point.
g. Mineral based finish flooring products such as tile, masonry, terrazzo, and cut stone without integral organic-based coatings and sealants and unfinished/untreated solid wood flooring qualify for credit without any IAQ testing requirements.
    1) Associated site-applied adhesives, grouts, finishes and sealers shall be compliant for a mineral-based or

unfinished/untreated solid wood flooring system to qualify for credit.

2) Concrete, wood, bamboo and cork floor finishes such as sealer, stain and finish shall meet requirements of South Coast Air Quality Management District SCAQMD) Rule 1113, Architectural Coatings, rules in effect on January 1, 2004.

3) Tile setting adhesives and grout shall meet South Coast Air Quality Management District (SCAQMD) Rule 1168. VOC limits correspond to an effective date of July 1, 2005 and rule amendment date of January 7, 2005.

4) For carpet adhesive, concrete, wood, bamboo and cork floor finishes, and tile setting adhesives, compliance can be demonstrated with test results of: Total volatiles fraction, based on one of following, provided water and exempt compounds are subtracted from total volatiles test results and mass VOC content is calculated consistent with SCAQMD Rule 1113 and Rule 1168: ASTM D 2369, EPA method 24, ISO 11890-1.

5) Total volatile organic compounds fraction, based on one of following, provided VOCs with a boiling point up to 536 degF are included, and exempt compounds are subtracted from total volatiles test results and the mass VOC content is calculated consistent with SCAQMD Rule 1113 and Rule 1168: ASTM D 6886, ISO 11890-2.

2. Option 2:

a. Flooring elements installed in building interior shall meet testing and product requirements of the California Department of Health Services Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers, including 2004 Addenda.

b. Mineral-based finish flooring products such as tile, masonry, terrazzo, and cut stone without integral organic based coatings and sealants and unfinished/untreated solid wood flooring qualify for credit without any IAQ testing requirements.

c. Associated site-applied adhesives, grouts, finishes and sealers shall be compliant for a mineral-based or unfinished/untreated solid wood flooring system to qualify for credit.

T. Low-Emitting Materials – Composite Wood and Agrifiber Products: Composite wood and agrifiber products and laminating adhesives used on interior of building shall not contain added urea-formaldehyde resins or urea-formaldehyde binders.

PART 3 - EXECUTION

3.1 ACCESS TO LEED ONLINE

A. Identify representative(s) and notify Project Team LEED Administrator in writing of representative(s) selected and contact information before or during pre-construction conference.
   1. Identify primary person.
   2. More than one representative is acceptable.
   3. Minimum one representative shall be a LEED Accredited Professional.

B. Project Team LEED Administrator shall provide website access to appointed LEED representative for Contractor.
   1. Project Team LEED Administrator shall forward e-mail invitation to Contractor's representative via Project LEED website.
      a. Recipient shall accept invitation, be provided access to project LEED website, and access assigned credits.
   2. Contractor shall be responsible for logging on and for confirming access to assigned credits within first 30 days of construction.
   3. LEED Online Version 3 website: https://www.usgbc.org/leedonline/

3.2 COMPLETION OF LEED ONLINE FORMS AND UPLOADS

A. Complete and conclude assigned credits on project LEED website.

B. When LEED requirements associated with Contractor's assigned credits have been met, Contractor representative shall be responsible for, but not limited to, completing form and uploading required information to project LEED website.
   1. Complete forms and provide required documentation on LEED Online within 30 days of Substantial Completion of project.

C. Apprise Project Team LEED Administrator of progress during completion of documentation process.

D. Respond to clarification comments received from USGBC for assigned credits within required timeframe.

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SECTION 01 81 16
HEALTHCARE SUSTAINABLE DESIGN REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section describes general requirements and procedures to comply with the Guiding Principles for Leadership in High Performance and Sustainable Buildings Memorandum of Understanding incorporated in the Executive Orders 13423 and 13514; Energy Policy Act of 2005 (EPAct 2005) and the Energy Independence and Security Act of 2007 (EISA 2007).

B. Project is designed to a sustainable rating of Silver Certifiable (not seeking LEED certification) in accordance with LEED Rating System for Healthcare Version 3.0.
   1. Work includes environmental, sustainable, and green building requirements related to efficient energy conservation, resources and indoor air quality.

1.2 QUALITY ASSURANCE

A. Reference Standards:
   1. United States Green Building Council (USGBC):
      a. LEED Reference Guide for Green Building Design and Construction, plus addenda.

B. Objectives
   1. To maximize resource efficiency and reduce the environmental impacts of construction and operation, the Contractor during the construction phase of this project shall implement the following procedures:
   2. Select products that minimize consumption of energy, water and non-renewable resources, while minimizing the amounts of pollution resulting from the production and employment of building technologies. It is the intent of this project to conform with EPA's Five Guiding Principles on environmentally preferable purchasing. The five principles are:
      a. Include environmental considerations as part of the normal purchasing process.
      b. Emphasize pollution prevention early in the purchasing process.
      c. Examine multiple environmental attributes throughout a product's or service's life cycle.
      d. Compare relevant environmental impacts when selecting products and services.
      e. Collect and base purchasing decisions on accurate and meaningful information about environmental performance.
   3. Control sources for potential Indoor Air Quality (IAQ) pollutants by controlled selection of materials and processes used in project construction in order to attain superior IAQ.
   4. Products and processes that achieve the above objectives to the extent currently possible and practical have been selected and included in these Construction Documents. The Contractor is responsible to maintain and support these objectives in developing means and methods for performing the work of this Contract and in proposing product substitutions and/or changes to specified processes.
   5. Use building practices that insure construction debris and particulates do not contaminate or enter duct work prior to system startup and turn over.

C. Related Documents
   1. Section 01 74 19 CONSTRUCTION WASTE MANANGEMENT
   2. Section 01 81 21 INDOOR AIR QUALITY MANAGEMENT (IAQ) DURING CONSTRUCTION
   3. Section 01 81 22 INDOOR AIR QUALITY PROTECTION BEFORE OCCUPANCY
   4. Section 01 91 15 BUILDING ENCLOSURE COMMISSIONING REQUIREMENTS
   5. Section 01 91 17 BUILDING ENCLOSURE FUNCTIONAL PERFORMANCE TEST PROTOCOL
   6. Section 01 91 13 GENERAL COMMISSIONING REQUIREMENTS

D. Definitions
1. Agrifiber Products: Composite panel products derived from agricultural fiber
2. Biobased Product: As defined in the 2002 Farm Bill, a product determined by the Secretary to be a commercial or industrial product (other than food or feed) that is composed, in whole or in significant part, of biological products or renewable domestic agricultural materials (including plant, animal, and marine materials) or forestry materials
3. Biobased Content: The weight of the biobased material divided by the total weight of the product and expressed as a percentage by weight
4. Certificates of Chain-of-Custody: Certificates signed by manufacturers certifying that wood used to make products has been tracked through its extraction and fabrication to ensure that it was obtained from forests certified by a specified certification program
5. Certified Wood: Wood based materials and products certified in accordance with Forest Stewardship Council's (FSC) Principles and Criteria for wood building components.
6. Composite Wood: A product consisting of wood fiber or other plant particles bonded together by a resin or binder
7. Construction and Demolition Waste: Includes solid wastes, such as building materials, packaging, rubbish, debris, and rubble resulting from construction, remodeling, repair and demolition operations. A construction waste management plan is to be provided by the Contractor as defined in Section 01 74 19.
8. EA: Energy and Atmosphere
9. GBCI: Green Building Certification Institute
10. ID: Innovation in Design
11. IEQ: Indoor Environmental Quality
12. LEED: Leadership in Energy and Design
13. Light Pollution: Light that extends beyond its source such that the additional light is wasted in an unwanted area or in an area where it inhibits view of the night sky
14. MR: Materials and Resources
15. Recycled Content Materials: Products that contain pre-consumer or post-consumer materials as all or part of their feedstock
16. Post-Consumer Recycled Content: The percentage by weight of constituent materials that have been recovered or otherwise diverted from the solid-waste stream after consumer use
17. Pre-Consumer Recycled Content: Materials that have been recovered or otherwise diverted from the solid-waste stream during the manufacturing process. Pre-consumer content must be material that would not have otherwise entered the waste stream as per Section 5 of the FTC Act, Part 260 "Guidelines for the Use of Environmental Marketing Claims": www.ftc.gov/bcp/grnrule/guides980427
18. Rapidly Renewable Materials: Materials and products made from plants typically harvested within ten (10) year, short cycle, or bi-product of an animal producing material on an on-going basis.
19. Regional Materials: Materials that are extracted, harvested, recovered, and manufactured within a radius of 250 miles (400 km) from the Project site
20. Salvaged or Reused Materials: Materials extracted from existing buildings in order to be reused in other buildings without being manufactured
21. Sealant: Any material that fills and seals gaps between other materials
22. SS: Sustainable Sites
23. Third Party Certification: Certification of levels of environmental achievement by nationally recognized sustainability rating system.
24. Type 1 Finishes: Materials and finishes which have a potential for short-term levels of off gassing from chemicals inherent in their manufacturing process, or which are applied in a form requiring vehicles or carriers for spreading which release a high level of particulate matter in the process of installation and/or curing.
25. Type 2 Finishes: "Fuzzy" materials and finishes which are woven, fibrous, or porous in nature and tend to adsorb chemicals off gas
26. USGBC: United States Green Building Council

27. Volatile Organic Compounds (VOCs): Any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, which participates in atmospheric photochemical reactions. Compounds that have negligible photochemical reactivity, listed in EPA 40 CFR 51.100(s), are also excluded from this regulatory definition.
28. WE: Water Efficiency

E. Preconstruction Meeting: After award of Contract and prior to the commencement of the Work, schedule and conduct meeting with Owner, Architect, and all Subcontractors to discuss the Construction Waste Management Plan, the required Construction Indoor Air Quality (IAQ) Management Plan, and all other Sustainable Design Requirements. The purpose of this meeting is to develop a mutual understanding of the Project's Sustainable Design Requirements and coordination of the Contractor's management of these requirements with the Contracting Officer and the Construction Quality Manager.

F. Construction Job Conferences: The status of compliance with the Sustainable Design Requirements of these specifications will be an agenda item at all regular job meetings conducted during the course of work at the site.

1.3 CONTRACTOR RESPONSIBILITIES

A. Sustainable Design Project Management and Coordination:
   1. Prior to Preconstruction Conference, identify and assign one person on Contractor's staff to be LEED Project Manager responsible for LEED issues, compliance and coordination.
   2. Qualifications:
      a. Similar responsibilities and performance for a minimum of two (2) LEED construction projects.
      b. LEED AP with applicable specialization.
   3. Responsibilities:
      a. Review Contract Documents for sustainable issues, coordinate work of trades, subcontractors, and suppliers; instruct workers relating to sustainable issues; and oversee Project Sustainable Goals.
      b. Assemble and retain electronic copies of approved Sustainable Submittals, tabulation charts and other records to document progress toward meeting sustainable requirements.
      c. Provide records in secure jobsite location, available for review by Architect or Owner.
      d. Provide Action Plans, Progress Reports and final documentation according to specified requirements and schedule.

B. Sustainable Records:
   1. Maintain comprehensive sustainable file electronically with verification documentation for each sustainable construction item for which responsible.
      a. Organize files to allow easy access to information and make available upon request.
      b. Include LEED Credit Checklist in file, applicable product data for material selection, final calculations, certifications for construction practices, procurement data, cumulative calculations and other items as identified in approved LEED Action Plans.
      c. Include required data to support full compliance with the LEED construction credits being pursued in file, in addition to data required to support compliance with LEED design credits as applicable.
      d. Include submittals for each construction credit attempted in event clarification is required by GBCI per LEED record requirements.
         1) MR Credit 3: Verification material.
         2) MR Credit 4.1: Verification material.
         3) MR Credit 4.2: Verification material.
         4) MR Credit 5: Verification material.
         5) IEQ Prerequisite 3: Remediation Plan and verification of compliance
         6) IEQ Credit 4: Product data showing compliance.
      e. File is to contain information current through previous month's work.

f. File is to be made available to Owner or Architect upon request throughout duration of project.

1.4 SUBMITTALS

A. Sustainable Action Plans:
   1. Submit the following Sustainable Action Plans within 30 days of Notice to Proceed:
      a. Sustainable Action Plan - Construction Waste Management per Section 01 74 19 CONSTRUCTION WASTE MANAGEMENT.
      b. Sustainable Action Plan - Sustainably Sourced Materials and Products
      c. Sustainable Action Plan - Indoor Air Quality During Construction
      d. Sustainable Action Plan - Indoor Air Quality Before Occupancy
   2. Sustainable Action Plans shall contain the following information:
      a. Project Materials Cost Data:
      b. Provide statement indicating total cost for materials used for project costs.
      c. Exclude labor, overhead, and profit.
      d. Provide detailed description of activities related to accomplishing project requirements, including construction practices, procurement practices, and proposed submittals and documentation for each sustainable item for which Contractor is responsible.
      e. Name of individual responsible for ensuring Prerequisites and/or Credits are earned and assembling and uploading documentation.

B. Sustainable Design Progress Reports:
   1. Submit reports concurrent with each Application for Payment comparing actual construction and purchasing activities with environmental action plans for the following:
      a. Construction Waste per Section 01 74 19 CONSTRUCTION WASTE MANAGEMENT.
      b. Sustainably Sourced Materials and Products
      c. PBT Source Reduction—Mercury in Lamps
      d. PBT Source Reduction—Lead, Cadmium and Copper
      e. Furniture & Medical Furnishings
   2. Provide final versions of the Project Materials Cost Data to the Owner and Architect not more than 14 days after Substantial Completion.

C. Sustainable Design Information:
   1. Construction Activity Pollution Prevention Plan (also referred to as the Stormwater Pollution Prevention Plan).
   2. Alternative Transportation: Provide manufacturer's cut sheets for all bike racks installed on site, including the total number of bicycle storage slots provided. Also, provide manufacturer's cut sheets for any alternative-fuel refueling stations installed on site, including fueling capacity information for an 8-hour period.
   3. Heat Island Effect:
      a. Site Paving: Provide manufacturer's cut sheets for all impervious paving materials, highlighting the Solar Reflectance Index (SRI) of the material. Also, provide cut sheets for all pervious paving materials.
      b. Roofing Materials: Submittals for roofing materials must include manufacturer's cut sheets or product data highlighting the Solar Reflectance Index (SRI) of the material.
   4. Exterior Lighting Fixtures: Submittals must include cut sheets with manufacturer's data on initial fixture lumens above 90° from nadir for all exterior lighting fixtures, and, for parking lot lighting, verification that the fixtures are classified by the IESNA as "full cutoff" (FCO); OR provide documentation that exterior luminaires are IDA-Approved as Dark-Sky Friendly by the International Dark Sky Association (IDA) Fixture Seal of Approval Program.
   5. Irrigation Systems: Provide manufacturer's cut sheets for all permanent landscape irrigation system components and for any rainwater harvesting system components, such as cisterns.

6. Water Conserving Fixtures: Submittals must include manufacturer's cut sheets for all water-consuming plumbing fixtures and fittings (toilets, urinals, faucets, showerheads, etc.) highlighting maximum flow rates and/or flush rates. Include cut sheets for any automatic faucet-control devices.
7. Process Water Use: Provide manufacturer's cut sheets for all water-consuming commercial equipment (clothes washers, dishwashers, ice machines, etc.), highlighting water consumption performance. Include manufacturer's cut sheets or product data for any cooling towers, highlighting water consumption estimates, water use reduction measures, and corrosion inhibitors.
8. Elimination of CFCs AND HCFCs: Provide manufacturer's cut sheets for all cooling equipment with manufacturer's product data, highlighting refrigerants; provide manufacturer's cut sheets for all fire-suppression equipment, highlighting fire-suppression agents; provide manufacturer's cut-sheets for all polystyrene insulation (XPS) and closed-cell spray foam polyurethane insulation, highlighting the blowing agent(s).
9. Appliances and Equipment: Provide copies of manufacturer's product data for all Energy Star eligible equipment and appliances, including office equipment, computers and printers, electronics, and commercial food service equipment (excluding HVAC and lighting components), verifying compliance with EPA's Energy Star program.
10. On-Site Renewable Energy Systems: Provide cut sheets and manufacturer's product data for all on-site renewable energy generating components and equipment, including documentation of output capacity.
11. Measurement and Verification Systems: Provide cut sheets and manufacturer's product data for all controls systems, highlighting electrical metering and trending capability components.
12. Materials and Resources:
    a. MR Credit 4.1: Submittal of lamp data demonstrating compliance with the reduction of mercury goals.
    b. MR Credit 4.2: Submittal of product data demonstrating compliance with the reduction of lead, cadmium and copper goals.
    c. MR Credit 5: Submittal of product data demonstrating compliance with furniture and medical furnishings.
13. Indoor Environmental Quality:
    a. Outdoor Air Delivery Monitoring: Provide manufacturer's cut sheets highlighting the installed carbon dioxide monitoring system components and sequence of controls shop drawing documentation, including CO2 differential set-points and alarm capabilities.
    b. Entryway Systems: Provide manufacturer's cut sheets for all walk-off systems installed to capture particulates, including permanently installed grates, grilles, slotted systems, direct glue-down walk-off mats, and non-permanent roll-out mats.
    c. See Sections 01 81 21 INDOOR AIR QUALITY MANAGEMENT DURING CONSTRUCTION and Section 01 81 22 INDOOR AIR QUALITY PROTECTION BEFORE OCCUPANCY for submittal requirements.
    d. Mercury in Lighting: Provide manufacturer's cut sheets or product data for all fluorescent or HID lamps highlighting mercury content.
    e. Lighting Controls: Provide manufacturer's cut sheets and shop drawing documentation highlighting all lighting controls systems components.
    f. Thermal Comfort Controls: Provide manufacturer's cut sheets and shop drawing documentation highlighting all thermal comfort-control systems components.
    g. Blended Cement: It is the intent of this specification to reduce CO2 emissions and other environmentally detrimental effects resulting from the production of portland cement by requiring that all concrete mixes, in aggregate, utilize blended cement mixes to displace portland cement as specified in Section 03 30 00, CONCRETE typically included in conventional construction. Provide the following submittals:
        1) Copies of concrete design mixes for all installed concrete
        2) Copies of typical regional baseline concrete design mixes for all compressive strengths used on the Project
        3) Quantities in cubic yards of each installed concrete mix

h. Gypsum Wall Board: Provide manufacturer's cut sheets or product data verifying that all gypsum wallboard products are moisture and mold-resistant.
i. Fiberglass Insulation: Provide manufacturer's cut sheets or product data verifying that fiberglass batt insulation contains no urea-formaldehyde.
j.
k. IEQ Credit 4: Product data showing compliance:
   1) Group 1: Product data indicating VOC content for adhesives and sealants applied inside the weatherproofing barrier and applied on-site and compliance with the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65).
   2) Group 2: Product data indicating VOC content for paints and coatings applied inside the weatherproofing barrier and applied on-site. Provide verification that ceiling tiles and wall coverings comply with the requirements of the California Department of Public Health Standard Method for the Testing and Evaluation of VOC Emissions (CDPH/EHLB/M-500 Standard Method v1.2).
   3) Group 3: Product data indicating compliance with referenced requirements for flooring systems and flooring adhesives.
   4) Group 4: Product data indicating composite wood and agrifiber products used inside the weatherproofing barrier contain no added urea-formaldehyde resin. Laminating adhesives used to fabricate on-site and shop-applied composite wood and agrifiber assemblies must not contain added urea-formaldehyde resins.
   5) Group 5: Product data indicating compliance with referenced requirements for exterior applied adhesives, sealants, coatings, roofing, and waterproofing materials.

PART 2 - PRODUCTS

A. Incorporate and document sustainable credits as identified in LEED credit checklist as required by Contract Documents and in compliance with LEED Reference Guide.
   1. LEED credits not identified elsewhere in the Contract documents and those requiring further instruction are specified below.
   2. Refer to the LEED Reference Guide for additional definitions and requirements.

B. Roofing Materials: All roofing systems, other than vegetated roof systems, must comply with the following requirements:
   1. Low-Sloped roofing less than or equal to 2:12 slope must have an SRI of at least 78.
   2. Steep-Sloped roofing greater than 2:12 slope must have an SRI of at least 29.
   3. Roofing Materials: Light-colored, reflective, and high-emissivity roofing helps to reduce localized heat build-up from roof surfaces that contribute to the urban heat island effect.

C. Exterior Lighting Fixtures:
   1. All exterior luminaires must emit 0% of the total initial designed fixture lumens at an angle above 90° from nadir and/or meet the requirements of the Dark Sky certification program.
   2. Exterior lighting cannot exceed 80% of the lighting power densities defined by ASHRAE/IESNA Standard 90.1-2010, Exterior Lighting Section, without amendments.
   3. No lighting of building facades or landscape features is permitted.
   4. Herbicides and Pest Control: Herbicides shall not be permitted, and pest control measures shall utilize EPA-registered biopesticides only.

D. Landscape Irrigation: Use water-efficient landscape and irrigation strategies, including water reuse and recycling, to reduce outdoor potable water consumption by a minimum of 50 percent over that consumed by conventional means (plant species and plant densities).

E. Water-Conserving Fixtures: Plumbing fixtures and fittings shall use in aggregate at least 20% less water than the water use baseline calculated for the building after meeting the Energy Policy Act of 1992 fixture performance requirements. Flow and flush rates shall not exceed the following:

1. Toilets: no more than 1.28 gallons per flush, otherwise be dual flush 1.6/0.8 gallons per flush, and have documented bowl evacuation capability per MaP testing of at least 400 grams.
2. Urinals: Waterless or Water sense rated with no more than 0.125 gallons per flush.
3. Lavatory Faucets: 0.5 gpm with automatic faucet controls
4. Kitchen Sink Lavatories: no more than 1.5 gpm.
5. Showerheads: no more than 1.5 gpm.

F. Process Water Use: Employ strategies that in aggregate result in 20% less water use than the process water use baseline for the building after meeting the commercial equipment and HVAC performance requirements as listed below. For equipment not addressed by EPACT 2005 or the list below, additional equipment performance requirements may be proposed provided documentation supporting the proposed benchmark or industry standard is submitted.
   1. Clothes Washer: 7.5 gallons/cubic foot/cycle.
   2. Dishwasher with Racks: 1.0 gallons/rack.
   3. Ice Machine: 20 gallons/100 pounds ice for machines making over 175 pounds of ice per day; 30 gallons/100 pounds ice for machines making less than 175 ice per day. Avoid water-cooled machines.
   4. Food Steamer: 2 gallons/hour. Use only boilerless steamers.
   5. Pre-Rinse Spray Valves: 1.4 gallons/minute.
   6. Kitchen Pot-Washing Sinks: 2.2 gallons/minute.
   7. Cooling Towers: 2.3 gallons/ton-hr. water loss
   8. For any equipment not listed, follow the guidelines for LEED credit WE Prerequisite 1.

G. Elimination of CFCs AND HCFCs:
   1. Ozone Protection and Greenhouse Gas Reduction: Base building cooling equipment shall contain no refrigerants other than the following: HCFC-123, HFC-134a, HFC-245fa, HFC-407c, or HFC 410a.
   2. Fire suppression systems may not contain ozone-depleting substances such as halon 1301 and 1211.
   3. Extruded polystyrene insulation (XPS) and closed-cell spray foam polyurethane insulation shall not be manufactured with hydrochlorofluorocarbon (HCFC) blowing agents.

H. Appliances and Equipment: All materials and equipment being installed that falls under the Energy Star or FEMP programs must be Energy Star or FEMP-rated. Eligible equipment includes refrigerators, motors, laundry equipment, office equipment and more. Refer to each program's website for a complete list.

I. HVAC Distribution Efficiency:
   1. All duct systems shall be constructed of aluminum, stainless steel or galvanized sheet metal, as deemed appropriate based on the application requirements. No fiberglass duct board shall be permitted.
   2. All medium- and high-pressure ductwork systems shall be pressure-tested in accordance with the current SMACNA standards.
   3. All ductwork shall be externally insulated. No interior duct liner shall be permitted.
   4. Where possible, all air terminal connections shall be hard-connected with sheet metal ductwork. If flexible ductwork is used, no flexible duct extension shall be more than six feet in length.
   5. All HVAC equipment shall be isolated from the ductwork system with flexible duct connectors to minimize the transmittance of vibration.
   6. All supply and return air branch ducts shall include the appropriate style of volume damper. Air terminal devices such as grilles, registers, and diffusers shall be balanced at duct branch dampers, not at terminal face.

J. Measurement and Verification: Install controls and monitoring devices as required by MEP divisions order to comply with International Performance Measurement & Verification Protocol (IPMVP), Volume III: Concepts and Options for Determining Energy Savings in New Construction, April 2003, Option D.

1. The IPMVP provides guidance on situation-appropriate application of measurement and verification strategies.

K. Material and Resources:
   1. MR Prerequisite 2, PBT Source Reduction – Mercury
      a. Comply with the mercury elimination requirement outlined in the 2010 FGI Guidelines for Design and Construction of Health Care Facilities (Section A1.3- 4b: Mercury Elimination).
         1) Do not install mercury-containing equipment, including thermostats, switching devices, and other building system sources (lamps are excluded).
      b. Do not install preheat, T-9, T-10, or T-12 fluorescents or mercury vapor type high intensity discharge (HID) lamps in the project. Do not install probe start metal halide HID lamps in interior spaces in the project.
      c. Illuminated exit signs will use Light-Emitting Diode (LED) or Light-Emitting Capacitor (LEC) lamps and use less than 5 watts of electricity.
      d. Submit manufacturer's documentation that fluorescent and high-pressure sodium lamps meet the following criteria:
         1) T-8 eight-foot fluorescent lamp: maximum 10 mg mercury.
         2) T-8 four-foot or shorter fluorescent lamp: maximum 3.5 mg mercury.
         3) T-8 U-bent fluorescent lamp: maximum 6 mg mercury.
         4) T-5 linear fluorescent lamp: maximum 2.5 mg mercury.
         5) T-5 circular fluorescent lamp: maximum 9 mg mercury.
         6) Compact fluorescent non-integral ballast lamp: maximum 3.5 mg mercury.
         7) Compact fluorescent integral ballast lamp: maximum 3.5 mg mercury Energy Star qualified.
         8) High pressure sodium lamp:
            a) Up to 400 watt fluorescent lamp: maximum 10 mg mercury.
            b) Above 400 watt fluorescent lamp: maximum 32 mg mercury.
   2. MR Credit 3, Sustainably Sourced Materials:
      a. General:
         1) General: LEED compliance based on the percentage total of all building materials and products used in the project (by cost) using any combination of the following measures.
            a) Document materials to indicate sum of compliant materials value constitutes a minimum 10 percent of the total materials cost for the project
         2) Materials and products used for MR 2 credit calculations must also verify compliance with the requirements for IEQ credit 4 or cannot be counted toward MR credit 3 compliance.
      b. Document materials to indicate sum of reused and salvaged materials .
         1) Determine Materials Reuse content value of project materials by method described in LEED Reference Guide
      c. Recycled Content: Document materials to indicate sum of post-consumer recycled content value plus one-half of post-industrial recycled content value.
         1) Determine recycled content value of project materials by method described in LEED Reference Guide.
         2) Steel and concrete cannot represent 75% or more of the total recycled content contributing toward this credit.
      d. Regional Materials: Document materials to indicate, by dollar value, materials and products for project are extracted, harvested or recovered, and manufactured, within five-hundred (500) mile radius of project site
         1) Determine amount of regional project materials by method described in LEED Reference Guide
      e. Rapidly Renewable Materials: Document materials, by dollar value, materials and products for project are biobased in nature and harvested within a ten (10) year or shorter cycle.

1) Determine amount of rapidly renewable materials by method described in LEED Reference Guide.

f. Certified Wood: Document materials to indicate percentage, by dollar value, of permanently installed virgin wood-based materials and products for project are certified in accordance with FSC STD 40-004 V2-1.
   1) Determine amount of FSC-certified project materials by method described in LEED Reference Guide.
      a) Vendor invoices for permanently installed wood products, both FSC certified and not, purchased by project contractor and subcontractors shall be compiled. Cost of wood products, both FSC certified and not, shall be tallied on appropriate LEED document (e.g., MRc7 template). Wood products not FSC certified and those identified on invoices as "FSC Pure" and "FSC Mixed Credit" shall be valued at 100 percent of product cost. Wood products identified as "FSC Mixed [NN] percent" shall be valued at indicated percentage of their cost, e.g., a product identified as "FSC Mixed 75 percent," shall be valued at 75 percent of cost. Wood products identified as "FSC Recycled" or "FSC Recycled Credit" do not count toward certified wood credits, but qualify instead as recycled content products.
      b) Each vendor invoice shall conform to the following requirements:
         (1) Each wood product shall be identified on a line-item basis;
         (2) FSC products shall be identified as such on a line-item basis;
         (3) Dollar value of each line item shall be shown;
         (4) Vendor's COC certificate number shall be shown on invoices including FSC products. Each wood product vendor that invoices FSC certified products shall be COC certified by an FSC accredited certifier.
      c) Wood-based materials include, but not limited to, following materials when made from wood, engineered wood products, or wood-based panel products:
         (1) Rough Carpentry
         (2) Miscellaneous carpentry.
         (3) Heavy timber construction.
         (4) Wood decking.
         (5) Metal-plate-connected wood trusses.
         (6) Structural glued-laminated timber.
         (7) Finish carpentry.
         (8) Architectural woodwork.
         (9) Wood paneling.
         (10) Wood veneer wall covering.
         (11) Wood flooring.
         (12) Wood lockers.
         (13) Wood cabinets.
      d) Supplemental cementitious materials derived from coal fired power plant wastes shall not have mercury content greater than 5.5 ppb (0.0055 mg/L). Fly ash generated as a by-product of municipal solid waster incinerators does not qualify as recycled-content material for this credit.

3. MR Credit 4.1, PBT Source Reduction - Mercury in Lamps
   a. Submit manufacturer's documentation that documents the fluorescent lamps are consistent with the following requirements:
      1) Eight-foot T-8 (Standard Output): 24,000 rated hours on instant start ballasts OR program start ballasts (3 hour starts).
      2) Eight-foot T-8 (High Output): 18,000 rated hours on instant start ballasts OR program start ballasts (3 hour starts).
      3) Four-foot T-8 (both Standard and High Output): 30,000 rated hours on instant start ballasts OR 36,000 rated hours on program start ballasts (3 hour starts).
      4) Two-foot and three-foot T-8: 24,000 rated hours on instant start ballasts OR program start ballasts (3 hour starts).

5) U-bent T-8: 18,000 rated hours on instant start ballasts OR 24,000 rated hours on program start ballasts (3 hour starts).
6) T-5 (both Standard and High Output): 25,000 rated hours on program start ballasts.
7) Compact fluorescent lamps – non integral ballast: 12,000 rated hours.
8) Compact fluorescent lamps - integral ballast – bare bulb: 10,000 rated hours.
9) Compact fluorescent lamps - integral ballast – covered models such as globes, reflectors and A-19s: 8,000 rated hours.
10) High pressure sodium lamps: Use non cycling type or replace with LED lamps or induction lamps.
11) Do not install circular fluorescent lamps or probe start metal halide lamps.

4. MR Credit 4.2, PBT Source Reduction - Lead, Cadmium, and Copper
   a. Submit manufacturer's documentation that lead-free solder and flux used to connect plumbing pipe on-site for water intended for human consumption meets the California AB1953 standard that solder shall not contain more than 0.2 percent lead and flux not more than a weighted average of 0.25 percent for wetted surfaces.
   b. Submit manufacturer's documentation that pipes, pipe fittings, plumbing fittings and faucets for water intended for human consumption meets the California AB1953 standard of a weighted average lead content of the wetted surface area of not more than 0.25 percent lead.
   c. Submit manufacturer's documentation that lead-free roofing and flashing have been applied.
   d. Submit manufacturer's documentation that the lead content of electrical wire and cable does not exceed <300ppm.
   e. Submit manufacturer's documentation that interior or exterior paints do not contain cadmium or lead. Green Seal certified paints or paints meeting Green Seal criteria exclude metals including cadmium, lead, mercury, antimony, and hexavalent chromium.
   f. Submit manufacturer's documentation that copper joints are mechanically crimped or that solder joints are compliant with ASTM B828 and specify and use ASTM B813 flux.
5. MR Credit 5, Furniture and Medical Furnishings
   a. A minimum of 30 percent of the total value of all freestanding furniture and medical furnishings, including, but not limited to, mattresses, foams, panel fabrics, cubicle curtains, window coverings, and other textiles, used in the Project (based on cost) shall meet the criteria below.
      1) All components of a furniture or medical furnishing assembly, including, but not limited to, textiles, finishes and dyes, shall contain less than 100 parts per million (ppm) of at least two of the following five chemicals:
         a) Urea formaldehyde.
         b) Heavy metals including mercury, cadmium, lead, antimony.
         c) Hexavalent chromium in plated finishes consistent with the Restriction of the Use of Certain Hazardous Substances of the European Union Directive (EU RoHS).
         d) Stain and non-stick treatments derived from perfluorinated compounds (PFCs), including perfluoroctanoic acid (PFOA).
         e) Added antimicrobial treatments.
      2) Product shall meet or exceed the indoor air quality requirements of California's Special Environmental Requirements, updated with California Department of Public Health Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers version 1.1 (CDPH/EHLB Standard Method v1.1) as determined by independent laboratory testing and using the standard office building furniture protocol parameters. The following program currently utilizes CDPH/EHLB Standard Method v1.1 requirements for compliance for furniture:
         a) Scientific Certification Systems (SCS) Indoor Advantage Gold Environmental Certification Program.

L. Low-Emitting Materials:
1. IEQ Credit 4, Low-Emitting Materials:
a. Group 1, Interior Adhesives and Sealants: For applications inside weatherproofing system and applied onsite, non-aerosol adhesives and sealants shall comply with following VOC content limits as adopted by SCAQMD Rule #1168, July 1, 2005 with rule amendment dated January 7, 2007. Aerosol adhesives must comply with Green Seal Standard GS-36, effective October 9, 2000.
1) Wood Glues: 30 g/L.
2) Metal-to-Metal Adhesives: 30 g/L.
3) Adhesives for Porous Materials (Except Wood): 50 g/L.
4) Subfloor Adhesives: 50 g/L.
5) Plastic Foam Adhesives: 50 g/L.
6) Carpet Adhesives: 50 g/L.
7) Carpet Pad Adhesives: 50 g/L.
8) VCT and Asphalt Tile Adhesives: 50 g/L.
9) Cove Base Adhesives: 50 g/L.
10) Gypsum Board and Panel Adhesives: 50 g/L.
11) Rubber Floor Adhesives: 60 g/L.
12) Ceramic Tile Adhesives: 65 g/L.
13) Multipurpose Construction Adhesives: 70 g/L.
14) Fiberglass Adhesives: 80 g/L.
15) Contact Adhesive: 80 g/L.
16) Structural Glazing Adhesives: 100 g/L.
17) Wood Flooring Adhesive: 100 g/L.
18) Structural Wood Member Adhesive: 140 g/L.
19) Single-Ply Roof Membrane Adhesive: 250 g/L.
20) Special-Purpose Contact Adhesive (Contact adhesive used to bond melamine-covered board, metal, unsupported vinyl, rubber, or wood veneer 1/16 IN or less in thickness to surface): 250 g/L.
21) Top and Trim Adhesive: 250 g/L.
22) Plastic Cement Welding Compounds: 250 g/L.
23) ABS Welding Compounds: 325 g/L.
24) CPVC Welding Compounds: 490 g/L.
25) PVC Welding Compounds: 510 g/L.
26) Adhesive Primer for Plastic: 550 g/L.
27) Sheet-Applied Rubber Lining Adhesive: 850 g/L.
28) Aerosol Adhesive, General-Purpose Mist Spray: 65 percent by weight.
29) Aerosol Adhesive, General-Purpose Web Spray: 55 percent by weight.
30) Special-Purpose Aerosol Adhesive (All Types): 70 percent by weight.
31) Other Adhesives: 250 g/L.
32) Architectural Sealants: 250 g/L.
33) Non-membrane Roof Sealants: 300 g/L.
34) Single-Ply Roof Membrane Sealants: 450 g/L.
35) Other Sealants: 420 g/L.
36) Sealant Primers for Nonporous Substrates: 250 g/L.
37) Sealant Primers for Porous Substrates: 775 g/L.
38) Modified Bituminous Sealant Primers: 500 g/L.
39) Other Sealant Primers: 750 g/L.
b. Group 2, Wall and Ceiling Finishes:
1) For applications inside weatherproofing system and applied onsite, paints and coatings shall comply with following VOC content limits as adopted by SCAQMD Rule 1113 July 1, 2008.
a) Flat Paints and Coatings: VOC not more than 50 g/L.
b) Nonflat Paints and Coatings: VOC not more than 150 g/L.
c) Dry-Fog Coatings: VOC not more than 150 g/L.
d) Primers, Sealers, and Undercoaters: VOC not more than 100 g/L.

e) Anticorrosive and Antirust Paints Applied to Ferrous Metals: VOC not more than 250 g/L.
f) Zinc-Rich Industrial Maintenance Primers: VOC not more than 100 g/L.
g) Pretreatment Wash Primers: VOC not more than 420 g/L.
h) Clear Wood Finishes, Varnishes, Lacquers, Sanding Sealers: VOC not more than 275 g/L.
i) Floor Coatings: VOC not more than 50 g/L.
j) Shellacs, Clear: VOC not more than 730 g/L.
k) Shellacs, Pigmented: VOC not more than 550 g/L.
l) Stains: VOC not more than 250 g/L.
m) Concrete Curing Compounds: 100 g/L.
n) Japans / Faux Finishing Coatings: 350 g/L.
o) Magnesite Cement Coatings: 450 g/L.
p) Waterproofing Sealers: 100 g/L.
q) Waterproofing Concrete / Masonry Sealers: 100 g/L.
r) Wood Preservatives: 350 g/L.
s) Low-Solids Coatings: 120 g/L.

2) Ceiling tiles, including suspended acoustical tiles, and wall coverings shall comply with the testing and product requirements of the California Department of Public Health Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers version 1.1 (CDPH/EHLB/M-500 Standard Method v1.1) modeled using the standard office building protocol parameters and certified as compliant by an independent third party.

c. Group 3, Flooring Systems: All flooring must comply with one of the following as applicable to the project scope:
1) Carpet and hard surface flooring installed in building interior shall comply with testing and product requirements of California Department of Public Health Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions From Indoor Sources Using Environmental Chambers version 1.1 (CDPH/EHLB/M-500 Standard Method v1.1), modeled using the standard office building protocol parameters and certified as compliant by an independent third party.
2) Mineral-based finish flooring products, such as tile, masonry, terrazzo, and cut stone without integral organic-based coatings and sealants and unfinished/untreated solid wood flooring, qualify for credit without any IAQ testing requirements.
a) Associated, site-applied adhesives, grouts, finishes and sealers must be compliant for a mineral-based or unfinished/untreated solid wood flooring system to qualify for the credit. :
3) Carpet cushion installed in the building interior must meet the requirements of the Carpet and Rug Institute Green Label program.
4) All flooring related adhesives shall comply with the requirements of Group 1.
5) Grout shall comply with requirements for ceramic tile adhesive.
6) Concrete, wood, bamboo and cork floor finishes such as sealer, stain and finish must meet the requirements of South Coast Air Quality Management District SCAQMD) Rule 1113, Architectural Coatings, rules in effect on January 1, 2004.
7) For carpet adhesive, concrete, wood, bamboo and cork floor finishes, and tile setting adhesives, compliance can be demonstrated with test results of: Total volatiles fraction, based on one of the following, provided that water and exempt compounds are subtracted from total volatiles test results and the mass VOC content is calculated consistent with SCAQMD Rule 1113 and Rule 1168: ASTM D 2369, EPA method 24, ISO 11890-1.

a) Total volatile organic compounds fraction, based on one of the following, provided that all VOCs with a boiling point up to 280°C (536°F) are included, and exempt compounds are subtracted from total volatiles test results and the mass VOC content is calculated consistent with SCAQMD Rule 1113 and Rule 1168: ASTM D 6886, ISO 11890-2.

d. Group 4, Composite Wood and Agrifiber Products and Batt Insulation Products:
   1) Composite wood and agrifiber products used inside of the weatherproofing system, shall contain no added urea-formaldehyde resins.
      a) Materials considered furniture, fixtures, and equipment (FF&E) are not to be included in credit compliance.
   2) Laminating adhesives used to fabricate on-site and shop-applied composite wood and agrifiber assemblies shall contain no added urea-formaldehyde resins.
   3) Batt insulation products shall contain no added formaldehyde, including urea formaldehyde, phenol formaldehyde, and urea-extended phenol formaldehyde.
e. Group 5, Exterior Applied Products:
   1) Adhesives, sealants, coatings, roofing and waterproofing materials field applied and installed from the weatherproofing system out, shall comply with the VOC limits of California Air Resources Board (ARB) 2007 Suggested Control Measure (SCM) for Architectural Coatings and South Coast Air Quality Management District (SCAQMD) Rule 1168 effective July 1, 2005.
   2) Roofing installations shall not use hot-mopped asphalt installation techniques.
   3) Parking lots and other paved surfaces shall not use coal tar sealants.
   4) For any waterproofing, asphalt roofing needing repair, parking lot sealing or other high VOC emissions outdoor construction process, create a plan to manage fumes and avoid infiltration to occupied spaces. Comply with procedures established by NIOSH's Asphalt Fume Exposures During the Application of Hot Asphalt to Roofs (Publication No. 2003-112)

END OF SECTION

SECTION 01 81 21
INDOOR AIR QUALITY MANAGEMENT (IAQ) DURING CONSTRUCTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements governing protection of indoor air quality (IAQ), absorbent materials, and mechanical system from contamination during construction and building flush out.

1.2 QUALITY ASSURANCE

A. American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) Standard 52.2-1999, Method of Testing General Ventilation Aor Cleaning Devices for Removal Efficiency by Particle Size.

B. SMACNA Guidelines for Occupied Buildings Under Construction, 2nd Edition 2007, ANSI/SMACNA 008-2008 (Chapter 3).

C. 2010 FGI Guidelines for Design and Construction of Health Care Facilities.

D. Joint Commission on Standards.

E. American Society of Healthcare Engineering (ASHE), Infection Control and Risk Assessment Standard.

F. US Centers for Disease Control and Prevention: Guidelines for Environmental Infection Control in Healthcare Facilities.

G. British Standard 5228-2009.

H. National Institute for Occupational Safety and Health, NIOSH Publication 2003-112, Asphalt Fume Exposures During the Application of Hot Asphalt to Roofs, Sections 4 and 5.

1.3 DESCRIPTION - GENERAL

A. IAQ Management Plan: Minimize contaminants generated during construction and pre-occupancy. Methods to include, but not limited to:
   1. Practices which minimize the amount of dust generated.
   2. Reduction of solvent fumes and volatile organic compound (VOC) emissions.
   3. Maintaining good housekeeping practices including sweeping and periodic dust and debris removal.
   4. Maintain dry conditions to protect stored on-site and installed absorptive materials from moisture damage.
   5. No visible haze in the air.

B. Prevent migration of moisture from exterior to building interior and prevent release of moisture from building materials that could result in formation of mold, delamination of adhesive applied materials or other damages caused by water.

1.4 PRECONSTRUCTION CONFERENCE

A. After award of Contract and prior to the commencement of the Work, schedule and conduct meeting with Owner and Architect to discuss and develop an agreement relative to the details of the following:
   1. IAQ Management Plan.
   2. Moisture Control Plan.
   3. Environmental Quality Management Plan (EQMP) or equivalent checklist.
   4. Moisture Control Plan.

1.5 SUBMITTALS

A. Project Information:
   1. IAQ Management Plan.
   2. Compliance Photographs:
      a. Provide a minimum of six (6) photographs at three distinct phases of completion demonstrating compliance with standard or examples of remediation efforts to bring into compliance.
      b. Date and time stamp photographs and identify approach taken for each.

B. IEQ 3.1, IAQ Management Plan:
   1. IAQ Management Plan.
   2. Compliance Photographs:
      a. Provide a minimum of six (6) photographs at three distinct phases of completion demonstrating compliance with standard or examples of remediation efforts to bring into compliance.
      b. Date and time stamp photographs and identify approach taken for each.
   3. Narrative describing protection measures for absorptive materials.
   4. Record of filtration media.
   5. Environmental Quality Management Plan (EQMP) or equivalent detailed checklist.
   6. Moisture Control Plan.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 CONSTRUCTION IAQ MANAGEMENT

A. IAQ Management Plan:
   1. Meet or exceed SMACNA Guidelines for Occupied Buildings Under Construction, 2nd Edition 2007, ANSI/SMACNA 008-2008 (Chapter 3), and include following measures:
      a. HVAC Protection
      b. Source Control
      c. Pathway Interruption
      d. Housekeeping
      e. Scheduling
   2. Provide solid physical barriers to isolate areas of construction.
      a. Securely attach and seal at floor and structure above.
   3. Schedule adequate time for product installation.
   4. Maintain negative pressure in construction area.
   5. Do not recirculate air prior to occupancy.
   6. Seal return air ducts and use direct exhaust to outside.
   7. Factory age sheet goods.
   8. Comply with manufacturer's instructions for appropriate drying times.
   9. Protect installed absorbent materials with recycled or recyclable materials.

B. HVAC Protection:
   1. Protect air handling and distribution equipment, and air supply and return ducting during construction.
   2. Adequately cover and protect exposed air inlets and outlets, openings, grilles, ducts, plenums, as required to prevent water, moisture, and other contaminant intrusion.
   3. Apply protection immediately after installation of equipment and ducting.
   4. Protect duct runs at end of each day's Work.
   5. During dust producing activities, e.g. drywall installation and finishing, turn ventilation system off, and protect HVAC supply and return openings from dust infiltration.
      a. Provide temporary ventilation.

6. Provide temporary filtration media for permanently installed air handlers if used during construction,
    a. Provide minimum efficiency reporting value (MERV) of 8 at each return air grille, per ASHRAE Standard 52.2-1999.
    b. Replace filtration media immediately prior to occupancy with air filters with that are a minimum of MERV 13.

C. Source Control:
1. Protect stored on-site or installed absorptive or porous materials such as batt insulation and drywall from exposure to moisture.
2. Do not use wet, damaged porous materials in the building. Materials with evidence of moisture damage, including stains, are not acceptable, including both stored and installed materials. Immediately remove them from the site and properly dispose.
3. Preconditioning:
    a. Prior to site delivery off-gas odorous products, or products with significant volatile organic compound (VOC) emissions, in dry, well ventilated space for 14 calendar days.
    b. Condition products, without containers and packaging, to maximize off-gassing of VOCs.
    c. Condition products in a ventilated warehouse or other building. Provide a temperature range of 60 degF minimum to 90 degF maximum continuously during ventilation period.
    d. Do not ventilate within limits of Work unless otherwise accepted by Architect.
    e. Comply with substitution requirements for consideration of other locations.
4. Take special care to prevent accumulation of moisture on installed materials and within packaging during delivery, storage, and handling to prevent development of molds and mildew, including materials with moisture stains.
5. Replace moldy materials with new, undamaged materials.
6. Provide ventilation, air circulation and air changes to dissipate excess humidity when present.
7. Prohibit the use of tobacco products inside the building and within 50 feet of the building during construction.

D. Pathway Interruption:
1. Seal openings within the designated work area.
2. Install exhaust ventilation equipment to maintain negative pressure differential between work area and adjacent areas of building.
3. Exhaust ventilation units to outside of building.

E. Housekeeping:
1. Provide temporary ventilation during construction to minimize accumulation of dust fumes, vapors, or gases in the building.
2. Continuously ventilate during and after installation of materials that emit VOCs until emissions dissipate:
    a. Period after installation shall be sufficient to dissipate odors and elevated levels of VOCs. Where no specific period is specified, ventilate for minimum of 72 hours.
    b. Ventilate areas directly to outside.
    c. If continuous ventilation is not possible via building's HVAC system, ventilate via openings and temporary fans at no less than 3 air changes per hour.
3. Suppress dust with wetting agents or sweeping compounds.
4. Remove dust using a wet method.
5. Increase cleaning frequency when dust build-up is noted.
6. Remove spills or excess applications of solvent-containing products as soon as possible.
7. Remove accumulated water and keep work areas as dry as possible.
8. Keep and store volatile liquid containers closed when container is inside of building and not in use.

F. Scheduling:

1. Where odorous or high VOC-emitting products are applied on site, apply before installation of porous and fibrous materials. Where not possible, protect porous materials with polyethylene vapor retarders.
2. Insure wet applied interior finish materials, such as paints, adhesives, sealants, coatings, finishes, and spray-applied materials, such as structural fireproofing, are fully cured prior to installation of finish materials.
3. Install carpets and furnishings after interior finish materials have been applied and fully cured.
4. Provide adequate ventilation of packaged dry products prior to installation. Remove from packaging and ventilate in a secure, dry, well-ventilated space free from strong contaminant sources and residues.
5. Complete interior finish material installation no less than 14 days prior to Substantial Completion.

3.2 MOISTURE CONTROL

A. Moisture Control Plan:
   1. Moisture Control Plan shall include:
      a. Project phasing and logistical planning that ensures either temporary or permanent protection in place that prevents the infiltration of water/moisture into the building.
      b. Communications of expectations and restrictions to subcontractors and suppliers involved in the Project.
      c. Methods used to seal building envelope prior to placement and installation of finish systems or materials prone to water intrusion and mold growth.
      d. A water damage response protocol that addresses notification, inspection, documentation, actions, repair/replacement and closeout.
      e. Protocol for pressurization of buildings or sections of building under construction , positive pressure maintained once sealed.
      f. Schedule of finish material application.

B. Moisture/Water/Mold Prevention:
   1. Protect stored on-site or installed absorptive or porous materials such as batt insulation and drywall from exposure to moisture.
   2. Install gypsum wall board minimum 1/2 IN above finish floor, unless otherwise indicated.
   3. Eliminate water or moisture intrusion into building or structure.
   4. Where mold growth is observed the effected materials shall be removed and disposed of by qualified handlers.
   5. Correct water leaks or infiltration within 24 hours of notification.

C. Store fuels, solvents, and other sources of VOCs separately from absorbent material.

D. Dispose materials off site susceptible to microbial growth and replace with new, undamaged materials.

3.3 ENVIRONMENTAL QUALITY MANAGEMENT

A. Environmental Quality Management Plan:
   1. Noise and Nuisance Plan.
      a. Develop a plan based on British Standard 5228-2009 to reduce noise emissions and vibrations from construction equipment and other non-road engines.
      b. Use construction equipment with low noise emissions or the lowest decibel level available that meets performance requirements in the British Standard.
      c. Construction crews must wear ear protection wherever sound levels exceed 85 dB for extended periods. Provide training and protective gear for workers.
      d. Limit effects of vibration on nearby historic or sensitive buildings.
      e. Implement source-reduction strategies by providing properly graded and maintained circulation paths, establishing no-idling and sequential equipment start-up policies, and retrofitting loud equipment with noise and vibration attenuators.
   2. Infection Control Risk Assessment.

a. Follow the 2010 FGI Guidelines for Design and Construction of Health Care Facilities and The Joint Commission on standards to establish an integrative infection control team comprising the owner, designer, and contractor to evaluate infection control risk.
b. Include an infection control risk assessment as part of IAQ Management Plan as a guideline for assessing the risk of construction activities and selecting mitigation procedures.
    1) Plan should take into account the occupants, patients, and programming unique to the project and the building as a whole per the 2010 FGI Guidelines for Design and Construction of Health Care Facilities Section 1.2-3 Infection Control Risk Assessment (ICRA) and The Joint Commission.

3. For renovation projects with any waterproofing, asphalt roofing needing repair, parking lot sealing, or other outdoor activities with high VOC emissions, comply with procedures in NIOSH Publication 2003-112, Asphalt fume Exposures During the Application of Hot Asphalt to Roofs, Sections 4 and 5.

END OF SECTION

SECTION 01 81 22
INDOOR AIR QUALITY PROTECTION BEFORE OCCUPANCY

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes procedural requirements for baseline indoor air quality testing prior to occupancy.

1.2 DESCRIPTION

A. Minimize indoor pollutant concentrations to required levels prior to occupancy by building flush-out.

1.3 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including Federal Acquisition Regulations, General Services Administration Acquisition Manual, and other Division 01 Specifications apply to this Section.

1.4 SUBMITTALS

A. Project Information:
   1. LEED Documentation:
      2. EQ Credit 3.2: IAQ Testing:
         a. Report from testing and inspecting agency indicating results of indoor-air-quality testing and documentation showing compliance with indoor-air-quality testing procedures and requirements
      3. EQ Credit 3.2: Building flush-out:
         1) Signed statement describing building air flush-out procedures including dates when flush-out was begun and completed and statement filtration media replaced after flush-out.
         2) Product data for filtration media used during flush-out and during occupancy.

PART 2 - PRODUCTS

2.1 FILTRATION MEDIA

A. Reference Section 01 81 21 for temporary filtration media required during and after IAQ Before Occupancy.

PART 3 - EXECUTION

3.1 BUILDING FLUSHOUT

A. LEED Credit EQ 3.2, IAQ Management Plan, Before Occupancy - Flushout:
   1. Option 1:
      a. Install new filtration media per Section 01 81 21.
      b. After construction ends, prior to occupancy and with interior finishes, furniture, and furnishings installed, perform building flush-out by supplying a total volume of 14,000 CU FT. of outdoor air per SF. of floor area while maintaining an internal temperature of at least 60 degF (and no higher than 80 degF) and a relative humidity of no higher than 60 percent.
   2. Option 2:
      a. Install new filtration media per Section 01 81 21.

b. If occupancy occurs prior to flush-out completion, space may be occupied following delivery of a minimum of 3,500 CU FT/SF of floor area of outdoor air to the space with interior finishes installed.
c. Maintain an internal temperature of at least 60 degF (and no higher than 80 degF) and a relative humidity of no higher than 60 percent.
d. When the space is occupied, ventilate at greater of minimum greater rate of 0.30 CFM/SF. of outside air or design minimum outside air rate as determined in by the EQ Prerequisite Minimum Indoor Air Quality Performance EQ Prerequisite 1.
e. Ventilate minimum three (3) hours prior to occupancy and continue during occupancy each day of flush-out period.
f. Maintain conditions until total of 14,000 CU FT/SF of outside air has been delivered to the space.
g. Interior finishes, furniture, and furnishings to be installed prior to flushout.

3.2 BASELINE IAQ TESTING

A. LEED Credit EQ 3.2, Construction IAQ Management Plan, Before Occupancy - Baseline IAQ Testing:
1. Air Quality Testing:
a. Conduct baseline indoor air quality testing after construction ends and prior to occupancy, using testing protocols consistent with EPA's "Compendium of Methods for the Determination of Air Pollutants in Indoor Air" and as detailed in USGBC's "LEED Reference Guide" with interior finishes installed.
b. Interior finishes, furniture, and furnishings to be installed prior to IAQ testing.
c. Demonstrate contaminant maximum concentrations listed below are not exceeded:
1) Formaldehyde: 20 micrograms/cu. m.
2) Particulates (PM10): 20 micrograms/cu. m.
3) Total Volatile Organic Compounds (TVOC): 200 micrograms/cu. m.
4) 4-Phenylcyclohexene (4-PH): 3 micrograms/cu. m.
5) Carbon Monoxide: 9 ppm and no greater than 2 ppm above outdoor levels.
d. For each sampling point where maximum concentration limits are exceeded, conduct additional flush out with outside air and retest specific parameters exceeded to indicate requirements are achieved. Repeat procedure until requirements are met. When retesting noncomplying building areas, take samples from same locations as in first test.
e. Air sample testing shall be conducted as follows:
1) Conduct measurements prior to occupancy during normal occupied hours with building ventilation system starting at normal daily start time and operated at minimum outside air flow rate for occupied mode throughout duration of air testing.
2) Building shall have interior finishes installed including, but not limited to, millwork, doors, paint, carpet, and acoustic tiles. Non-fixed furnishings such as workstations and partitions are encouraged but not required to be in place for testing.
3) Number of sampling locations vary depending on size of building and number of ventilation systems. For each portion of building served by a separate ventilation system, the number of sampling points shall not be less than one per 25,000 SF or for each contiguous floor area, whichever is larger, and include areas with least ventilation and greatest presumed source strength.
4) Air samples must be collected between 3 and 6 feet from the floor to represent the breathing zone of occupants, and over a minimum 4-hour period.

END OF SECTION

SECTION 01 91 00
GENERAL COMMISSIONING REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. The work under this Section is subject to requirements of the Contract Documents including the Owner's General Conditions and articles of the General Contractor's General Conditions.

B. This section includes the commissioning requirements for the building Specialties, Equipment, Conveying Equipment, Fire Suppression, Plumbing, HVAC, Electrical, Communications, Electronic Safety and Security, Site Utilities, Transportation and Integrated Systems. Refer to section 019115 for the Building Enclosure Commissioning requirements.

1. The Commissioning requirements for the building Specialties, Equipment, Conveying Equipment, Fire Suppression, Plumbing, HVAC, Electrical, Communications, Electronic Safety and Security, Site Utilities, Transportation and Integrated Systems given in this section are entirely separate from and in addition to the Building Enclosure Commissioning requirements specified in section 019115. The General Contractor, Contractors, Sub-contractors and Suppliers are required to participate in both Commissioning processes as required by this section and 019115 Building Enclosure Commissioning.
2. The 019113 Commissioning Agent and 019115 Building Enclosure Commissioning Agent will provide separate documentation for each Commissioning process.

1.2 DESCRIPTION

A. Commissioning is a systematic process of ensuring all building systems perform interactively according to design intent and Owner's operational needs. Commissioning will encompass and coordinate traditionally separate functions of system documentation, installation checkout, equipment start-up, control system calibration and point-to-point checkout, testing and balancing, and functional performance testing. Commissioning is intended to achieve the following specific objectives according to the Contract Documents:

1. Verify and document proper installation and performance of equipment and systems.
2. Provide Owner with functional buildings and/or systems with minimal operational problems at time of move-in.

B. Commissioning does not take away from or reduce responsibility of system designers or installing contractors to provide a finished and fully functioning product.

C. This section shall in no way diminish the responsibility of the Division 10, 11, 14, 21, 22, 23, 25, 26, 27, 28, 33, 34, and 48 Contractors, Sub-contractors and Suppliers in performing all aspects of work and testing as outlined in the contract documents. Any

requirements outlined in this section are in addition to requirements outlined in Division 10, 11, 14, 21, 22, 23, 25, 26, 27, 28, 33, 34, and 48 Specifications.

1.3 ABBREVIATIONS

A. The following are common abbreviations used in the Specifications (definitions are found further in this Section):

1. A/E - Architect and Design Engineers – Design Build
2. BAS - Building Automation System
3. BECxA – Building Enclosure Commissioning Agent (refer to 019115).
4. CC - Controls Sub-contractor – Design Build
5. CT - Commissioning Team
6. Cx - Commissioning
7. CxA - Commissioning Agent
8. Cx Plan - Commissioning Plan
9. Cx-PMOR – Commissioning Performance Monitoring, Optimization, and Reporting.
10. EC - Electrical Sub-contractor – Design Build
11. FPT - Functional Performance Test
12. GC – Design Build Contractor
13. MC - Mechanical Sub-contractor – Design Build
14. O&M - Operations & Maintenance
15. OR - Owner's Representative
16. PC – Plumbing Contractor – Design Build
17. PFC - Pre-Functional Checklist
18. RFI - Request for Information
19. TAB - Test, Adjust and Balance

1.4 DEFINITIONS

A. Acceptance Phase: Phase of construction after start-up and initial checkout when Functional Performance Tests, O&M documentation review and training occur.

B. Approval: Acceptance that a piece of equipment or system has been properly installed and is functioning in tested modes according to the Contract Documents.

C. Architect/Engineer (A/E) (Design Build): Prime consultant (architect) and sub-consultants who comprise the design team, generally HVAC Mechanical Designer/Engineer and Electrical Designer/Engineer.

D. Basis of Design (BOD): Documentation of primary thought processes and assumptions behind design decisions made to meet design intent. Describes systems, components, conditions and methods chosen to meet intent.

E. Building Enclosure Commissioning Agent (BECxA): Contracted to Owner. BECxA directs and coordinates day-to-day Building Enclosure Commissioning activities independently from CxA. Refer to section 019115 for Building Enclosure Commissioning Requirements. BECxA reports directly to Owner.

F. Commissioning Agent (CxA): Contracted to the Owner's A/E. The CxA is not the responsibility of the Design Build Team. CxA directs and coordinates commissioning activities discussed herein.

G. Commissioning Plan: Overall plan developed by the CxA that provides structure, schedule and coordination planning for commissioning process.

H. Commissioning Performance Monitoring, Optimization, and Reporting (Cx-PMOR) – Cloud Based SaaS (Software as a Service) which provides automated building operating data acquisition, analysis, archival, and reporting by utilizing data provided from the building automation system to continually analyze and improve the overall performance of the building and its underlying mechanical and electrical systems.

I. Contract Documents: Documents binding on parties involved in construction of this project (drawings, specifications, change orders, amendments, contracts, etc.).

J. Contractor (Design Build): Contracted directly to Owner.

K. Control System: System and components associated with building automation system.

L. Deferred Functional Tests: Functional tests performed after substantial completion due to partial occupancy, equipment, seasonal requirements, design or other site conditions that disallow test from being performed.

M. Deficiency: Condition of a component, piece of equipment or system that is not in compliance with Contract Documents (that is, does not perform properly or is not complying with design intent).

N. Functional Performance Test Procedures: Commissioning protocols and detailed test procedures and instructions that fully describe system configuration and steps required to determine if the system is performing and functioning properly. These procedures shall be used to document Functional Performance Tests.

O. Functional Performance Test (FPT): Test of dynamic function and operation of equipment and systems. Systems are tested under various modes, such as during low cooling or heating loads, high loads, component failures, unoccupied, varying outside air temperatures, life safety conditions, power failure, etc. Systems are run through all specified sequences of operation. Components are verified to be responding in accordance with contract documents. Functional Performance Tests are executed after Pre-Functional Checklists and start-ups are complete.

P. Monitoring: Recording of parameters (flow, current, status, pressure, etc.) of equipment operation using data loggers or trending capabilities of control systems.

Q. Overridden Value: Writing over a sensor value in control system to see response of a system (e.g., changing outside air temperature value from 52°F to 72°F to verify economizer operation). See also "Simulated Signal".

R. Pre-Functional Checklist (PFC): A list of static inspections and elementary component tests that verify proper installation of equipment (e.g., belt tension, oil levels, labels affixed, gages in place, sensors calibrated, etc.).

S. Seasonal Performance Tests: Functional Performance Tests deferred until system(s) ambient conditions are closer to design conditions.

T. Simulated Condition: Condition created for testing component or system (e.g., applying heat to space temperature sensor to monitor response of VAV box).

U. Simulated Signal: Disconnecting sensor and using signal generator to send amperage, resistance or pressure to transducer and/or DDC system to simulate value to BAS.

V. Specifications: Construction specifications of Contract Documents.

W. Start-up: The activities where systems or equipment are initially tested and operated. Start-up is completed prior to functional testing.

X. Sub-contractor: Contractors of the prime Design Build Contractor, and their Sub-contractors, who provide and install building components and systems.

Y. Test Procedures: Step-by-step process, which must be executed to fulfill test requirements.

Z. Test Requirements: Requirements specifying what modes and functions, etc. will be tested. Test requirements are not detailed test procedures. Test requirements are specified in the Cx Plan.

AA. Trending: Monitoring using building control system.

BB. Vendor: Supplier of equipment.

CC. Warranty Period: Warranty period for entire project, including equipment components.

1.5 RELATED WORK

A. Specific Building Systems Commissioning requirements are given in this specification. The following specification sections are related to the Commissioning work specified in this section:

1. 019115 and 019117 – Building Enclosure Commissioning Requirements
2. Division 10 – Specialties
3. Division 11 – Equipment
4. Division 14 – Conveying Equipment
5. Division 21 – Fire Suppression
6. Division 22 – Plumbing
7. Division 23 – HVAC
8. Division 25 – Integrated Automation
9. Division 26 - Electrical
10. Division 27 – Communications
11. Division 28 – Electronic Safety and Security
12. Division 33 – Utilities
13. Division 34 – Transportation
14. Division 48 – Electrical Power Generation

1.6 COORDINATION

A. Commissioning Team: Members of the Commissioning Team (CT) will consist of:

1. Commissioning Agent (CxA).
2. Building Enclosure Commissioning Agent (BECxA – see 019115)
3. Owner's Representative(s) (OR).
4. Architect and Design Engineers (A/E) (Design Build).
5. General Contractor (GC) (Design Build)
6. Mechanical Contractor (MC).
7. Plumbing Contractor (PC).
8. Electrical Contractor (EC).
9. Test and Balance Contractor (TAB Contractor).
10. Controls Contractor (CC).
11. Any other Division 10, 11, 14, 21, 22, 23, 25, 26, 27, 28, 33, 34, and 48 Contractors or Sub-contractors who provide and install the equipment to be commissioned.
12. Equipment Suppliers and Vendors.

B. Management: Owner will contract services of the CxA. The CxA will direct and coordinate commissioning activities and report to the OR. All members of the Commissioning Team shall cooperate to fulfill contracted responsibilities and objectives of the Contract Documents.

C. Kick-off Meeting: Within 60 days of commencement of construction, CxA will plan, schedule and conduct a commissioning kick-off meeting. Membership and responsibilities of the commissioning team will be clarified at this meeting. CxA will distribute meeting minutes to all parties.

D. Scheduling:

1. CxA will work with commissioning team to establish required commissioning activities to incorporate in preliminary commissioning schedule. The GC will integrate commissioning activities into master construction schedule. Representatives of the commissioning team will address scheduling problems. Necessary notifications are to be made in a timely manner in order to expedite commissioning.
2. The CxA will provide initial schedule of primary commissioning events at commissioning kick-off meeting. As construction progresses, more detailed schedules are developed by the commissioning team.

1.7 SUBMITTALS

A. Contractor shall provide CxA with documentation required for commissioning work. At minimum, documentation shall include: Requirements as described in Section 01 33 00.05 20, detailed start-up procedures, full sequences of operation, O&M data, performance data, any performance test procedures, duct pressure testing procedures and results, piping pressure testing and flushing procedures and results, control drawings and details of Owner contracted tests. In addition, installation and checkout materials actually shipped inside equipment and actual field checkout sheet forms used by factory or field technicians shall be submitted to CxA.

B. CxA shall review submittals concurrently with A/E. CxA shall review submittals:

1. For conformance as it relates to commissioning. Review is primarily intended to aid in development of functional testing procedures and only secondarily to verify compliance with equipment specifications.
2. To insure maintenance and operation requirements are addressed.
3. To verify compliance with the Basis of Design and Owner's Project Requirement information provided by the A/E.

C. CxA submittal review comments will be submitted to the A/E and OR.

1.8 START-UP PLAN

A. GC/Sub-contractors responsible for purchase, installation and start-up of commissioned equipment shall compile all testing and equipment start-up documentation into an overall Start-Up Plan document.

B. Start-Up Plan shall include the following documentation:

1. Testing Documentation:

a. GC/Sub-contractor shall compile documentation and recording forms for all testing required by Division 10, 11, 14, 21, 22, 23, 25, 26, 27, 28, 33, 34, and 48 specifications (e.g. duct pressure testing, duct cleaning, pipe pressure testing, piping flushing and cleaning plans, electrical testing, etc.). Testing documentation shall include:

1) A written description of the required testing and the procedures required to complete the testing.
2) All instrumentation utilized for the testing.
3) Checklist with boxes or lines for recording and documenting the completion of the testing activity and results.

2. Equipment Start-Up Documentation:

a. GC/Sub-contractor shall compile detailed start-up procedures from equipment manufacturer and checkout procedures with normally used field checkout sheets. Start-up documentation shall include checklists and procedures with specific boxes or lines for recording and documenting inspections of each piece of equipment.

3. Control System Start-Up Documentation:

a. GC/Controls Contractor shall compile all control systems start-up and initial check-out documentation and recording forms including but not limited to point-to-point verifications, control sensor calibrations, and control valve/damper actuator calibrations for inclusion in the Start-Up Plan. Control System Start-up documentation shall include checklists and procedures with specific boxes or lines for recording and documenting inspections of each control system point, sensor or device.

4. Test and Balance Documentation:

a. Start-Up Plan documentation shall include the TAB Execution Plan outlining the TAB procedures and proposed sequencing and scheduling of required TAB work.

5. Equipment Maintenance Log:

a. Start-Up Plan documentation shall include a list of all maintenance tasks (including frequency of execution) required to be performed on equipment started to insure equipment warranties are not voided. Start-Up Plan documentation shall include a log for each required maintenance task for Sub-contractor/Vendor to document execution of the required maintenance tasks from Start-Up through Final Application for Payment.

C. Start-Up Plan documentation shall be provided in "searchable" electronic PDF format as follows:

1. Provide a separate Start-Up Plan PDF file for each Division of work (e.g. Division 10 Start-Up Plan, Division 11 Start-Up Plan, Division 14 Start-Up Plan, Division 21 Start-Up Plan, Division 22 Start-Up Plan, Division 23 Start-Up Plan, etc.)
2. Each Start-Up Plan PDF file will have a Cover Sheet with Project Information and Document Title.
3. Each Start-Up Plan PDF file will have a Table of Contents. The Table of Contents shall be "bookmarked" for hyperlink navigation directly to each section and item/document noted below.

a. Proposed Schedule/Sequencing Plan of Testing and Start-Up activities.
b. Testing documentation (e.g. duct pressure testing, duct cleaning, piping pressure testing, piping flushing and cleaning, electrical testing, etc.) organized by specification section.
c. Start-Up Checklists for each item of equipment organized by specification section.
d. Control System Start-Up activities completed by the Controls Contractor including but not limited to all point-to-point verifications, control sensor calibrations and control actuator calibrations.
e. Warranty Maintenance Log for each item of equipment organized by specification section.
f. TAB Execution Plan.

D. Start-Up Plan Execution:

1. GC/Sub-contractor shall submit initial Start-Up Plan to CxA for review 60 days prior to start of any testing or start-up activities. CxA shall review the initial Start-Up Plan to insure that the required documentation is provided and organized as required. CxA shall provide a Start-Up Plan review report. GC/Sub-contractors shall revise the initial Start-Up Plan documentation as required by CxA review comments.
2. GC/Sub-contractor shall submit final schedule of testing and start-up activities to CxA 30 days prior to any testing or start-up activity to allow CxA to witness if desired.
3. GC/Sub-contractor shall execute equipment/systems testing and start-up per Start-Up Plan, document results and compile/organize all Start-Up Plan documentation into electronic PDF files (searchable from Table of Contents to each documentation item).
4. GC/Sub-contractor forward copy of completed Start-Up Plan PDF files to CxA for review to verify completion of start-up

activities. Executed Start-Up Plan PDF files must be submitted to CxA prior to start of Functional Testing.

1.9 OWNER TRAINING PLAN

A. GC/Sub-contractors/Vendors will provide complete Owner training in start-up, operation and maintenance of all commissioned systems/equipment under contract per Division 1, 10, 11, 14, 21, 22, 23, 25, 26, 27, 28, 33, 34, and 48 specifications.

B. GC with assistance from responsible Sub-contractors/Vendors and CxA shall develop a detailed program for Owner Training.

C. General sequencing of the development of the Owner Training Program and completion of the Owner training is as follows:

1. GC will hold a meeting with the GC/Sub-contractors/Vendors, and Owner's Facility Staff to review the Owner training requirements, preparation of Owner Training Program and coordinate scheduling of the Owner training sessions.
2. Schedule for Owner training sessions will be reviewed and updated as required throughout the project construction by CT at contractor progress meetings (attended by CxA during periodic site visits). GC will submit final Owner Training Schedule to CT 30 days prior to start of training exercises to allow CxA sufficient time to schedule site visit trips to witness the Owner training exercises as required.
3. Sub-contractors/vendors will execute training exercises per Training Program.
4. GC/Sub-contractors will submit a copy of the final executed Training Program including all Training Manuals and associated documentation (sign-in sheets, hand-outs, etc.)and Instructional DVDs to CxA on completion of Owner Training exercises (CxA copy is in addition to any copies required for Owner use).

1.10 SYSTEMS MANUAL DOCUMENTATION

A. GC/Sub-contractors/Vendors will provide the following documentation to the CxA prior to Project Closeout for preparation of a Systems Manual. This documentation is in addition to any other Project Closeout documentation required in other sections of the specifications:

1. Final A/E approved equipment submittals.
2. Final A/E approved Operations and Maintenance (O&M) Data including:

a. Recommended schedule and frequency for equipment maintenance.

3. As-Built Control Drawings and Sequences of Operation including:

a. Operating instructions for associated integrated building systems.
b. Instructions for Energy Saving Operations and descriptions of Energy Savings Strategies in use in the facility.
c. Seasonal start-up and shut down procedures, manual and restart operations procedures, recommendations regarding seasonal operational issues that affect energy use.

d. A list of equipment time of day schedules (occupied/unoccupied) and a schedule frequency to review them for relevance and efficiency.
e. A table of all sensors and actuators including a recommendation for recalibration frequency of each sensor and actuator by type and use.
f. A table of all user adjustable set points and reset schedules with a brief discussion of the purpose of each and the range of reasonable adjustments with energy implications. Include a schedule of frequency to review the various set points and reset schedules to ensure they are at current relevant and efficient values.

4. Documentation shall be provided in "searchable" electronic Adobe PDF format organized as follows:

a. Separate Adobe PDF file for:

1) Equipment Submittals.
2) Equipment O&M Data.
3) As Built Controls.

b. Table of Contents for each PDF document organized by contract document specification section and specific contract document identification tag. The Table of Contents shall by hyperlinked to allow direct access to each individual equipment item and each specific information item for the equipment.

PART 2 - PRODUCTS

2.1 "BUILDING START" DATABASE

A. The Commissioning process will be executed utilizing a "cloud-based" database called "Building Start". "Building Start" may be executed utilizing any Android, IOS or Windows based operating system notebook or tablet (notebook or tablet provided by GC/Sub-contractor; "Building Start" application provided free via web download).

B. CxA will provide the GC/Sub-contractors with web access to the "Building Start" database during the Commissioning process to allow the GC/Sub-contractors to complete the scoped Commissioning tasks indicated in other sections of this specification (e.g. notification of deficiency item corrections, readiness for Functional Performance Testing, etc.).

2.2 "PERFORMANCE PLUS" MONITORING, OPTIMIZATION AND REPORTING SYSTEM (Cx-PMOR)

A. Mechanical, Plumbing and Electrical Systems operation will be continually monitored and analyzed by a "cloud-based" software package (Cx-PMOR) provided by the CxA utilizing data provided from the Building Automation System.

B. The Controls Contractor for this project shall provide automated data reporting through the Building Automation System which shall deliver system operating data and utility consumption data daily to the Cx-

PMOR system via trend reports which are automatically emailed to the Cx-PMOR system. The complete cost for the Controls Contractor to set up ALL required trending and reporting shall be included in the project contract cost.

2.3 TEST EQUIPMENT

A. Division contractors shall provide all specialized tools, test equipment and instruments required to execute start-up, checkout and functional performance testing of equipment under their contract.

B. Test equipment shall be of sufficient quality and accuracy to test and/or measure system performance with tolerances specified. A testing laboratory shall have calibrated test equipment within the previous 12 months. Calibration shall be NIST traceable. Equipment shall be calibrated according to manufacturer's recommended intervals and when dropped or damaged. Calibration tags shall be affixed or certificates readily available.

PART 3 - EXECUTION

3.1 COMMISSIONING OVERVIEW

A. The following provides a brief overview of typical commissioning tasks during construction and general order in which they occur:

1. CxA develops project specific Construction Phase Commissioning Plan including specific Pre-Functional Checklists and equipment and system Functional Performance Test procedures. Construction Phase Commissioning Plan is forwarded to Commissioning team members for review prior to Cx Kick-Off meeting.
2. Commissioning during construction begins with a kick-off meeting conducted by CxA where membership of commissioning team is established and responsibilities reviewed. The construction phase commissioning plan is reviewed during this meeting.
3. CxA schedules subsequent meetings as necessary to plan, coordinate and schedule commissioning activities. Deficiencies and problem resolution will also be discussed at these meetings.
4. GC submits copies of submittals for all equipment to be commissioned to CxA for review simultaneous with A/E review. CxA reviews equipment submittals and forwards review comments to AE and OR.
5. GC/Sub-contractors develop Owner Training Program.
6. CxA executes Pre-Functional Checklists utilizing "Building Start" database during periodic site visits. The Pre-Functional Checklists will be executed in phases such as setting equipment, piping equipment, insulating it, making up electrical connections, etc. The purpose is to execute the process and complete the checklists in the "Building Start" database as the work is being completed and not to wait until the end of the installation to complete the checklists.
7. Sub-contractors provide the necessary personnel to assist CxA (e.g. remove A/C unit covers, open electrical panel covers, etc.) with the PFC completion.
8. Sub-contractors correct any installation issues noted by CxA during PFC completion. Sub-contractors will notify CxA of issue corrections by updating issue status in the "Building Start" database.

9. Sub-contractors develop Start-Up Plans. GC and Sub-contractors coordinate overall schedule of equipment/systems testing and start-up and submit schedule to CxA so that CxA may witness testing and start-up activities as required.
10. Sub-contractors complete testing (e.g. duct and piping pressure testing, piping flushing, etc.) as required by Division 22, 23 and 26 specifications. Sub-contractors compile copies of completed testing documentation in the Start-Up Plan for CxA review.
11. Sub-contractors perform start-up and initial checkout per the Start-Up Plan documentation and checklists. Sub-contractors assemble completed Start-Up Plan documentation and submit to CxA for verification of completion of start-up activities prior to functional performance tests.
12. Controls Contractor sets up required BAS System trending and reporting for Cx-PMOR Software analysis.
13. Functional Performance Tests are executed by Sub-contractors, under supervision of and documented by CxA.
14. Items of non-compliance in material, installation or set-up will be corrected at Sub-contractor expense and system shall be retested.
15. CxA executes Post Functional Performance Testing Cx-PMOR monitoring (2 week period following Cx Functional Performance Testing). GC/Sub-contractors correct deficiencies identified during Post Functional Performance Testing.
16. GC/Sub-contractors execute Owner Training exercises per Owner Training Plan.
17. CxA issues final Commissioning Report.
18. CT participates in an End of Warranty Review meeting with facility maintenance staff to review systems performance.
19. CxA issues updates for Warranty Review Meeting for insertion in final Commissioning Report.

3.2 SYSTEMS TO BE COMMISSIONED

Systems To Be Commissioned	**Description**
Building Exterior Closure - Refer to Specification 01 91 15	
Foundations (excluding structural)	Standard, special, slab-on-grade, vapor barriers, air barriers
Basements	Basement walls, crawl spaces, waterproofing, drainage
Superstructure	Floor construction, roof construction, sunshades, connections to adjacent structures
Exterior Closure	Exterior walls, exterior windows, exterior doors, louvers, grilles and sunscreens,
Roofing	Roof system (including parapet), roof openings (skylights, pipe chases, ducts, equipment curbs, etc.)
Specialties	
Patient Bed Service Walls	Medical gas certification and cross check, electrical connections
Equipment	
Parking Control Equipment	Barriers
Laboratory Fume Hoods	Fume Hood Certification
Biological Safety Cabinets	Cabinet Certification
Packaged Incinerators	Combustion Testing, Cycle Certification

Conveying Equipment	
Electric Dumbwaiters	Interface with other systems (Fire Alarm, etc.) [ASTM testing and certification by others]
Elevators	Interface with other systems (fire alarm, etc.) [ASTM testing and certification by others]
Escalators	Interface with other systems (fire alarm, etc.) [ASTM testing and certification by others]
Material Delivery Systems	Interface with other systems (fire alarm, elevators, etc.)
Pneumatic Tube Systems	Interface with other systems (fire alarm, etc.)
Fire Suppression	
Fire Pump	Fire Pump, jockey pump, fire pump controller/ATS
Fire Sprinkler Systems	Wet pipe system, dry pipe system, pre-action system, special agent systems
Plumbing	
Domestic Water Distribution	Booster pumps, backflow preventers, water softeners, potable water storage tanks
Domestic Hot Water Systems	Water heaters**, heat exchangers, circulation pumps, point-of-use water heaters*
Sewerage Pump Systems	Sewage ejectors
Wastewater Pump Systems	Sump pumps
Sanitary Waste Interceptors	Grease interceptors, acid neutralizers
General Service Air Systems	Packaged compressor systems, air dryers, filtration
Medical Air Systems	Packaged medical air compressor units. Outlet certification, cross-connection verification
Medical Vacuum Systems	Packaged medical vacuum units, outlet certification, cross-connection verification
Dental Air Systems	Packaged dental air compressor units, outlet certification, cross-connect verification
Dental Evacuation and Vacuum Systems	Packaged Dental Evacuation units, packaged dental vacuum units, outlet certification, cross-connection verification
Waste Anesthesia Gas Systems	Packaged Waste Anesthesia Gas units, outlet certification, cross-connection verification
Medical Gas Systems (other than Medical Air Systems)	Medical gas (oxygen, nitrogen, nitrous oxide, etc.) tank/manifold systems, outlet certification, cross-connection verification
Chemical Waste Systems	Chemical storage tanks, neutralization systems, ventilation, process control
Reverse-Osmosis Systems	Packaged Reverse-Osmosis systems
Water De-Alkalizing Systems	Package Water De-Alkalizing systems
HVAC	

Noise and Vibration Control	[Noise and vibration levels for critical equipment such as Air Handlers, Chillers, Cooling Towers, Boilers, Generators, etc. will be commissioned as part of the system commissioning]
Direct Digital Control System**	Operator Interface Computer, Operator Work Station (including graphics, point mapping, trends, alarms), Network Communications Modules and Wiring, Integration Panels. [DDC Control panels will be commissioned with the systems controlled by the panel]
Chilled Water System**	Chillers (centrifugal, rotary screw, air-cooled), pumps (primary, secondary, variable primary), VFDs associated with chilled water system components, DDC Control Panels (including integration with Building Control System)
Condenser Water System**	Cooling Towers, Fluid Coolers, heat exchangers/economizers, pumps, VFDs associated with condenser water system components, DDC control panels.
Steam/Heating Hot Water System**	Boilers, boiler feed water system, economizers/heat recovery equipment, condensate recovery, water treatment, boiler fuel system, controls, interface with facility DDC system.
HVAC Air Handling Systems**	Air handling Units, packaged rooftop AHU, Outdoor Air conditioning units, humidifiers, DDC control panels
HVAC Ventilation/Exhaust Systems	General exhaust, toilet exhaust, laboratory exhaust, isolation exhaust, room pressurization control systems
HVAC Energy Recovery Systems**	Heat Wheels, Heat Recovery Loops, AHU Integrated Heat Recovery
HVAC Terminal Unit Systems**	VAV Terminal Units, CAV terminal units, fan coil units, fin-tube radiation, unit heaters
Decentralized Unitary HVAC Systems*	Split-system HVAC systems, controls, interface with facility DDC
Unitary Heat Pump Systems**	Water-source heat pumps, controls, interface with facility DDC
Humidity Control Systems	Humidifiers, de-humidifiers, controls, interface with facility DDC
Hydronic Distribution Systems	Pumps, DDC control panels, heat exchangers,
Facility Fuel Systems	Boiler fuel system, generator fuel system
Geothermal Energy Direct Use Heating **	Geothermal well, ground heat exchanger, geothermal pumps, heat exchanger, valves, instrumentation
Solar Energy Heating Systems **	Solar collectors, heat exchangers, storage tanks, solar-boosted domestic hot water heater, pumps, valves, instrumentation
Facility Fuel Gas Systems	Witness Natural gas piping pressure testing, natural gas compressors and storage, propane storage

Smoke Evacuation System	Atrium smoke evacuation, other smoke evacuation and smoke management systems, controls, interface with other systems (fire alarm), emergency operation.
Electrical	
Medium-Voltage Electrical Distribution Systems	Medium-Voltage Switchgear, Medium-Voltage Switches, Underground ductbank and distribution, Pad-Mount Transformers, Medium-Voltage Load Interrupter Switches,
Grounding & Bonding Systems	Witness 3rd party testing, review reports
Electric Power Monitoring Systems	Metering, sub-metering, power monitoring systems, PLC control systems
Electrical System Protective Device Study	Review reports, verify field settings consistent with Study
Secondary Unit Substations	Medium-voltage components, transformers, low-voltage distribution, verify breaker testing results (injection current, etc.)
Low-Voltage Distribution System	Normal power distribution system, Life-safety power distribution system, critical power distribution system, equipment power distribution system, switchboards, distribution panels, panelboards, verify breaker testing results (injection current, etc.)
Emergency Power Generation Systems	Generators, Generator paralleling switchgear, automatic transfer switches, PLC and other control systems
Lighting & Lighting Control** Systems	Emergency lighting, occupancy sensors, lighting control systems, architectural dimming systems, theatrical dimming systems, exterior lighting and controls
Cathodic Protection Systems	Review 3rd party testing results.
Lightning Protection System	Witness 3rd party testing, review reports
Perturbation Testing	Testing of Emergency Power Systems Loss of power feed, confirmation of the following values: Time of ramp up of generator to full power Emergency lighting adequacy Effect on waste treatment facilities (if applicable) Alarms and notification system adequacy Drives & Controls functionality Functionality of all UPS systems And Switch-over of the above when main power feed is restored Perturbation Testing shall occur after completion of Functional performance Testing. Requires require signed certifications by Contractor's rep and Government witness that systems operated and

	responded properly.
Communications	
Grounding & Bonding System	Witness 3rd party testing, review reports
Structured Cabling System	Witness 3rd party testing, review reports
Master Antenna Television System	Witness 3rd party testing, review reports
Public Address & Mass Notification Systems	Witness 3rd party testing, review reports
Intercom & Program Systems	Witness 3rd party testing, review reports
Nurse Call & Code Blue Systems	Witness 3rd party testing, review reports
Security Emergency Call Systems	Witness 3rd party testing, review reports
Duress Alarm Systems	Witness 3rd party testing, review reports
Electronic Safety and Security	
Grounding & Bonding	Witness 3rd party testing, review reports
Physical Access Control Systems	Witness 3rd party testing, review reports
Access Control Systems	Witness 3rd party testing, review reports
Security Access Detection Systems	Witness 3rd party testing, review reports
Video Surveillance System	Witness 3rd party testing, review reports
Electronic Personal Protection System	Witness 3rd party testing, review reports
Fire Detection and Alarm System	100% device acceptance testing, battery draw-down test, verify system monitoring, verify interface with other systems.
Renewable Energy Sources	
Geothermal Energy Electrical Generation Systems **	Geothermal well, DC-AC Inverters, storage batteries, turbine generator modules, switchgear, combiner boxes, instrumentation, monitoring and control systems
Solar Energy Electrical Power Generation Systems **	Solar collector modules, DC-AC inverter, storage batteries, combiners, Switchgear, instrumentation, monitoring and control systems
Wind Energy Electrical Power Generation Systems **	Wind Turbines, DC-AC inverter, storage batteries, combiners, switchgear, instrumentation, monitoring and control systems
Site Utilities	
Water Utilities	City Water Service Entrance, Backflow Prevention, Pressure Control, Booster Pumps, Irrigation Systems, Rainwater Harvesting Systems
Sanitary Sewerage Utilities	City Sanitary Connection, Waste Treatment Systems

Storm Drainage Utilities	City Storm Water Connection, Site Storm Water Distribution
Energy Distribution Utilities	Connection to Third Party Energy (Steam, High Temp Hot Water, Chilled Water) Supply Systems, Metering, Pressure Control
Transportation	
Active Traffic Barrier Systems	Witness 3rd party testing
Integrated Systems Tests	
Loss of Power Response	Loss of power to building, loss of power to campus, restoration of power to building, restoration of power to campus.
Fire Alarm Response	Integrated System Response to Fire Alarm Condition and Return to Normal

Table Notes

All certification tests specified are the responsibility of the DB.

Functional Performance Test protocols are written by the CxA. Functional Testing is performed by the DB and is witnessed by the CxA.

** Denotes systems that LEED requires to be commissioned to comply with the Fundamental Commissioning pre-requisite.

3.3 RESPONSIBILITIES OF COMMISSIONING TEAM MEMBERS

A. Architect/Engineer (A/E) (Design Build):

1. Document design intent of systems.
2. Turn over the following design documentation in electronic (Adobe PDF) format to the CxA for preparation of a Systems Manual:

    a. Final Basis of Design document including a description and rationale for all energy and water saving features and strategies including design intent for operation and caveats about their function and maintenance relative to energy use.
    b. Final "as-built" one line system diagrams for systems to be commissioned.

B. Commissioning Agent (CxA):

1. Facilitate cooperation of CT in commissioning work.
2. Provide monthly progress reports of commissioning status.
3. Develop Construction Phase Commissioning Plan including project specific Pre-Functional Checklists and Functional Performance Test procedures.
4. Conduct initial commissioning Kick-Off Meeting within 60 days of construction notice to proceed to review Cx Plan and responsibilities of each member of the CT.
5. Identify commissioning activities for inclusion into the project schedule by the GC.
6. Review shop drawings for equipment to be commissioned concurrent with the A/E. Provide submittal review comments to A/E for inclusion in the submittal comments returned to the GC. Modify Cx Plan if required based on final A/E approved submittals.

7. Review A/E approved control submittal sequences of operation and update Commissioning Plan Functional Performance Tests (FPTs) if required. Work with Contractors and A/E until sufficient clarity has been obtained, in writing, to update Commissioning Plan FPTs.
8. Make periodic site visits to complete commissioning work. Provide a summary "Site Visit Report" following each site visit
9. Attend and chair commissioning team meetings as required. Typically periodic site visits will be scheduled to allow attendance at regularly scheduled contractor progress meetings.
10. Execute Pre-Functional Checklists in "Building Start" database in phases as the work is completed.
11. Review, track and coordinate resolution of non-compliance and deficiencies identified by commissioning team. Maintain Master Deficiency List (MDL), Resolution Log, & Testing Record. Maintain records of all issues submitted by commissioning team.
12. Review the Start-Up Plan prepared by the GC/Sub-contractors including the TAB Execution Plan, Flushing and Cleaning Plans and Start-Up/Sequencing Plans. Primary role is to ensure written documentation is produced that verifies that systems testing and equipment/system manufacturer recommended startup/checkout procedures have been completed
13. Monitor completion of Start-Up activities by Sub-contractors.

    a. CxA will randomly observe the Start-Up activities of key components and systems to be commissioned completed by the Sub-contractor/Vendor during periodic site visits. This will include random observations of the Controls Contractor Start-Up activities.
    b. CxA will review final executed Start-Up Plan systems testing and equipment start-up documentation completed by Sub-contractors.

14. Conduct a Commissioning Functional Testing Schedule Workshop with the Commissioning Team in order to establish a coordinated approach to the integration of the Functional Performance Testing activities within the Master Construction Schedule.
15. Conduct Trend-Logging Plan Meeting with GC/Controls Contractor prior to Functional Testing to coordinate BAS trending requirements for use with the Commissioning Performance Monitoring, Optimization and Reporting (Cx-PMOR) System. Trend-Logging Plan Meeting will coordinate and finalize:

    a. System points to be monitored.
    b. Frequency/interval of monitoring for each point.
    c. Trending data output format and presentation and e-mailing requirements.

16. Review the final Test and Balance Report prior to Functional Performance Testing.
17. Review the Electrical Protective Device Coordination Study and confirm installed settings in the field for commissioned equipment.
18. Witness FPTs. Document test results and recommend system for acceptance.
19. As a part of functional testing, verify accuracy of final TAB report by randomly sampling Final TAB report air and water readings spaces (16 hours of verifications over a single consecutive two day testing period). This will include a verification of the space pressure relationships by tissue/smoke test. Document results of TAB verification.
20. Executes Post Functional Performance Testing Cx-PMOR monitoring (2 week period following Cx Functional Performance Testing).

21. Review Operation & Maintenance Manuals for compliance with the contract document requirements.
22. Monitor the completion of the Owner Training exercises by:

    a. Attending selected Owner Training Sessions.
    b. Reviewing the final executed Owner Training Program documentation submitted by the GC/Sub-contractors at the completion of the Owner Training exercises.

23. Provide final commissioning report, summarizing final disposition of building systems after Functional Performance Testing.
24. Compile systems manual utilizing documentation provided by GC/Sub-contractors.
25. Witness Deferred Seasonal Testing and modify or append Commissioning Report as required.
26. Make Warranty Phase Site Visits (3 total prior to End of Warranty Review Meeting) to reinforce training, evaluate performance of the installed systems and provide technical support to the operating team to sustain commissioned performance of the systems.
27. Approximately 10-11 months into the Warranty Period, the CxA shall provide a comprehensive review of the system operation using the Cx-PMOR system to analyze the data provided from the BAS over the Warranty period and issue a Warranty Phase Issue Log for review by the CT at the Warranty Review Meeting.
28. Conduct a Warranty Review Meeting and document findings.

C. General Contractor (GC) (Design Build):

1. Review Commissioning Plan, Pre-Functional Checklists, and FPT procedures.
2. Attend commissioning kick-off meeting and other commissioning team meetings.
3. Assist CT with developing a comprehensive commissioning schedule.
4. Incorporate commissioning activities into the construction schedule.
5. Periodically update commissioning activities in the construction schedule.
6. Facilitate cooperation of Sub-contractors in commissioning work.
7. Submit copies of submittals for commissioned system equipment to CxA for review simultaneous with A/E review.
8. Oversee development of equipment Start-Up Plan (see paragraph 1.8) by Sub-contractor and execution of equipment Start-Up checks by Sub-contractor/Vendors.

    a. Insure equipment Start-Up Plan is developed and contains forms for all required testing and start-up activities.
    b. With Sub-contractors, develop overall schedule of testing and start-up activities. Submit final testing and start-up schedule to CxA 30 days prior to start of any such activities to allow CxA to schedule site visit trips to witness activities as required.
    c. Insure final executed Start-Up Plan is submitted to CxA prior to start of functional performance testing. Insure final executed start-up plan is organized and contains all documentation required by this specification before submitting to CxA.

9. Develop, with cooperation of CT, detailed Owner Training Program (see paragraph 1.9).
10. Attend the Commissioning Functional Testing Schedule Workshop conducted by CxA with the Commissioning Team in order to establish a coordinated approach to the integration of the Functional

Performance Testing activities within the Master Construction Schedule. Update the Master Construction Schedule to include all Functional Performance Testing activities.

11. Assures CxA that equipment and systems are ready for Functional Performance Testing. Verifies that the following activities are completed and documentation submitted to CxA as a prerequisite for Functional Performance Testing:

    a. All deficiency items noted by CxA prior to Functional Performance Testing are corrected by Sub-contractors and "Building Start" database is updated accordingly.
    b. Executed Start-Up Plan electronic PDF files submitted to CxA including:

        1) All equipment/systems testing documents completed by Sub-contractors.
        2) All equipment/systems start-up documents completed by Sub-contractors/Vendors.
        3) All control system start-up documentation completed by Controls Contractor.
        4) Maintenance logs of all interim maintenance tasks performed by Sub-contractors/Vendors on all equipment from initial start-up through final Owner acceptance so warranties are not void.

    c. Attend Trend-Logging Plan Meeting with CxA and Controls Contractor. Verify trending data is e-mailed to the Commissioning Performance Monitoring, Optimization and Reporting (Cx-PMOR) System prior to the start of Functional Testing.
    d. Submit hard-copy Commissioning Plan Functional Performance Test checklists signed and dated by Controls Contractor to CxA for review prior to start of Functional Testing (to verify Controls Contractor has thoroughly checked all FPTs prior to CxA witnessing FPTs).
    e. Final Test and Balance Report is submitted to CxA for review.

12. Insures resolution of non-compliance and deficiencies of construction related items identified by commissioning team. Obtains written documentation of completion from the appropriate Sub-contractors.
13. Notifies CxA of completion of GC/Sub-contractor Commissioning Activities (e.g. deficiency corrections, Start-Up completion, readiness for Functional Performance Testing, etc.) via "Building Start" database. Updates to "Building Start" database regarding status of Commissioning activities shall be made within two working days of activity completion.
14. Facilitate cooperation of Sub-contractors and Vendors during Functional Performance Testing.
15. Verify Sub-contractors correct deficiencies identified during Post Functional Performance Testing Cx-PMOR monitoring (2 week period following Cx Functional Performance Testing).
16. Compile and submit Operation & Maintenance Manuals for review by CxA.
17. Turn over Systems Manual documentation to CxA (see paragraph 1.10).
18. GC coordinates training sessions and executes training per Owner Training Program through his sub-contractors. GC will submit final Owner Training Schedule to CT 30 days prior to start of training exercises to allow CxA sufficient time to schedule site visit trips to witness and participate in the Owner training exercises as required.

19. Schedule, coordinate and assist CT in Deferred Seasonal Testing.
20. Participate in a warranty review of system/equipment performance.

D. Sub-contractors/Vendors (Design Build):

1. Review Commissioning Plan, Pre-Functional Checklists, and FPT procedures.
1. Attend commissioning kick-off meeting and other commissioning team meetings.
2. Assist CT with developing a comprehensive commissioning schedule.
3. Prepare Owner Training Program with GC (see paragraph 1.9).
4. Provide necessary personnel to assist CxA (e.g. remove FCU covers, open electrical panel covers, etc.) with execution of Pre-Functional Checklists during CxA periodic site visits.
5. Document that bolted connections in electrical equipment have been properly tightened to recommended torque levels. CxA will provide checklists for each major piece of electrical equipment for the Sub-contractor to complete. These checklists are intended to be completed as individual pieces of equipment are installed.
6. With GC and CT, develop Start-Up Plan (see paragraph 1.8).
7. Execute all required equipment and systems testing as required by project specifications (e.g. duct pressure testing, piping pressure testing, piping flushing, electrical acceptance testing, etc.). Provide schedule of testing activities to CxA 30 days prior to start of any testing so that CxA may witness a sampling of the testing as required. Submit completed testing documentation in final executed Start-Up Plan electronic PDF files to CxA for review prior to start of functional testing.
8. Execute equipment start-up per Start-Up Plan. Provide schedule of equipment start-up activities to CxA 30 days prior to beginning any equipment start-up so that CxA may witness a sampling of the equipment start-up activities as required. Submit completed start-up documentation in final executed Start-Up Plan electronic PDF files to CxA prior to start of functional testing.
9. Execute all periodic maintenance required on started equipment from initial start-up of equipment to final acceptance by Owner to prevent equipment warranties from being voided. Document execution of periodic maintenance by signing and dating maintenance logs for each item of equipment. Submit maintenance log documentation in final executed Start-Up Plan electronic PDF files to CxA prior to start of Functional Performance Testing.
10. Correct deficiencies of construction related items identified by CxA. Update "Building Start" database to reflect deficiency item corrections for CxA verification. Updates to "Building Start" database regarding corrections of deficiencies shall be made within two working days of completion of deficiency correction work.
11. Notify CxA of completion of Commissioning Activities (e.g. deficiency corrections, Start-Up completion, readiness for Functional Performance Testing, etc.) via "Building Start" database. Updates to "Building Start" database regarding status of Commissioning activities shall be made within two working days of activity completion.
12. Ensure installation work is complete, is in compliance with Contract Documents and is ready for Functional Performance Testing.

    a. Verify Pre-Functional Checklists are 100% complete electronically via "Building Start" database prior to start of Functional Performance Testing.
    b. Verify all deficiency items noted by CxA prior to Functional Performance Testing are corrected and deficiency item status

is updated in "Building Start" database. Deficiency item status updates should be made within two days of completion of corrective work.

c. Notify CT that equipment and systems are ready for Functional performance testing.

13. Execute FPTs developed by CxA as described in contract documents and Commissioning Plan. FPT test results will be documented by CxA.
14. Provide certified and calibrated instrumentation required to take measurements of system and equipment performance during Functional Performance Testing.
15. Correct deficiencies identified during Post Functional Performance Testing Cx-PMOR monitoring (2 week period following Cx Functional Performance Testing).
16. Prepare and submit Operation & Maintenance Manuals for review by CxA.
17. With GC; execute training per Owner Training Program as specified in Divisions 10, 11, 14, 21, 22, 23, 25, 26, 27, 28, 33, 34, and 48 of these specifications.
18. Turn over Systems Manual documentation to CxA (see paragraph 1.10).
19. Execute Deferred Seasonal Testing.
20. Make necessary amendments to O&M Plans for applicable issues identified in Deferred Testing and Peak Season Performance Testing.
21. Participate in a Warranty Review of system/equipment performance. Correct any deficiency issues noted during warranty period per the Project Warranty Process.

E. Controls Contractor (CC) (Design Build):

1. Attend commissioning kick-off meeting and other commissioning team meetings.
2. Prepare Owner Training Program with GC (see paragraph 1.9).
3. Completely install and thoroughly inspect start-up, test, adjust, calibrate and document systems and equipment under Building Automation/Controls Contract.
4. Provide necessary personnel to assist CxA (e.g. open control panel covers, etc.) with execution of Pre-Functional Checklists during CxA periodic site visits.
5. Provide laptop computer, software and training to accommodate TAB Contractor in system balancing.
6. Maintain database of control parameters submitted by TAB Contractor subsequent to field adjustments and measurements.
7. Submit schedule of control system start-up activities to CxA 30 days prior to beginning any control system start-up work to allow CxA to witness control systems start-up work as required.
8. Maintain comprehensive records of all control system start-up records including but not limited to system calibration checkout records and point-to-point checklists. Submit all control system start-up records to CT prior to start of functional testing.
9. Ensure installation work is complete, is in compliance with Contract Documents and is ready for Functional Performance Testing.

   a. Verify Pre-Functional Checklists are 100% complete electronically via "Building Start" database prior to start of Functional Performance Testing.
   b. Verify all deficiency items noted by CxA prior to Functional Performance Testing are corrected and deficiency item status is updated in "Building Start" database. Deficiency item

status updates should be made within two days of completion of corrective work.

c. Notify CT that equipment and systems are ready for Functional Performance Testing.

10. Submit executed copies of the commissioning functional tests (signed and dated by the control Sub-contractor technician directly responsible for verification of the control sequence or system operation) prior to functional testing (to show that the control Sub-contractor has actually tested and verified each sequence prior to CxA witnessing the functional testing).
11. Provide BAS System trending data for the Commissioning Performance Monitoring, Optimization and Reporting (Cx-PMOR) System as follows

a. Data Set-Up and Reporting. The Controls Contractor for this project shall provide automated data reporting through the Building Automation System which shall deliver system operating data and utility consumption data daily to the Cx-PMOR system via trend reports which are automatically emailed to the Cx-PMOR system. The complete cost for the Controls Contractor to set up ALL required trending and reporting shall be included in the project contract cost. The Cx-PMOR trending and reporting shall be provided for all equipment monitored and controlled by the BAS. All BAS system trending data set-up and reporting to Cx-PMOR system must be completed as a prerequisite for Cx Functional Performance Testing. BAS Trending shall remain in place regardless of continued Owner participation in Cx-PMOR monitoring.
b. Attend meeting with CxA and GC to coordinate trend-logging plan for Cx-PMOR system.
c. Trend reports shall be emailed to the Cx-PMOR server on a daily basis between 12AM and 6AM.
d. The duration of each trend report shall include at least the entire previous day's (e.g. midnight to midnight) data. Optionally, the report could be required to include the previous three days' data so that 1-2 days of missing reports could be made up by the subsequent report. The reports shall NEVER include more than a maximum five days data. The CxA shall provide direction as to the desired duration.
e. All required system operating data trends shall report the instantaneous value of the data point being trended at 15-minute intervals unless specifically directed otherwise by the CxA. The trend sampling interval for each data point must be consistent (e.g. data cannot start at a five-minute interval and then change to a fifteen-minute interval).
f. All utility consumption data (KWH, Ton-Hr, BTU, etc.) trends shall report the accumulated consumption across the interval period (e.g. electrical consumption, KWH, total for the 15-minute period) and shall not report total accumulating consumption. Demand shall be calculated as a virtual point by the Cx-PMOR analysis system.
g. The Contractor shall submit their proposed trending file format to the CxA for approval prior to implementing for all requested trend points (CSV or XLS files are preferred format however PDF may also be acceptable). ***Once approved and set up the trend file formatting shall NOT change from one report to the next.*** If trend formatting changes due to software upgrade then the Contractor shall be required to compensate CxA for any changes required to the PMOR system configuration to accept the new data formatting.
h. The following data point naming convention shall be utilized for all trend reports and for the subject line of emails delivering the automated report:

< Building Name >.< System Name >.<Point Name>

Example: "Building.AHU01.SAT"

i. All data point names must be unique from other points in the same project.
j. Minimum Required Monitoring Points:

1) The final list of points to be monitored will be furnished by CxA to the Controls Contractor after the building automation system submittal has been reviewed.
2) A formal trend request document will be provided to the Controls Contractor with the monitored points list and this same document shall be completed and returned to the CxA as proof that set-up has been completed.

k. Example of Monitored Points by System Type:

1) Variable Air Volume Air Handling Units

a) Outside Air Setpoint, cfm
b) Outside Air Flow, cfm
c) Mixed Air Temperature, deg F
d) Return Air Temperature, deg F
e) Supply Air Temperature, deg F
f) Chilled Water Control Valve, %OPEN
g) Heating Water Control Valve, %OPEN
h) Supply Fan Speed, %
i) Static Pressure Setpoint, "w.c.
j) Static Pressure, "w.c.

2) Variable Volume Terminal Units

a) Airflow, cfm
b) Airflow Required, cfm
c) Space Temperature, deg F
d) Discharge Air Temperature, deg F
e) Effective Temp Setpoint, deg F
f) Cooling Loop Output, %
g) Heating Loop Output, %
h) Primary Air Damper, %OPEN

l. Submit two weeks of operating data (either automatically or manually) to Cx-PMOR System for CxA review to assess the readiness of the specific system to begin on-site Functional Testing.
m. Trending data reporting will be left in place for Owner use after building occupancy.

12. Provide on-site technician skilled in software programming and hardware operation to exercise sequences of operation and to correct control deficiencies identified during Functional Performance Testing.
13. Provide instrumentation, computer, software, and communication resources necessary to demonstrate total operation of building systems and control system equipment during Functional Performance Testing.
14. Provide on-site technician skilled in software programming and hardware operation to exercise sequences of operation and to

correct control deficiencies identified during Post Functional Performance Testing Cx-PMOR monitoring.
15. Prepare and submit Operation & Maintenance Manuals for CxA review.
16. With GC; execute training per Owner Training Program.
17. Turn over Systems Manual documentation to CxA (see paragraph 1.10).
18. Provide on-site technician skilled in software programming and hardware operation to exercise sequences of operation and to correct control deficiencies identified during Deferred Seasonal Testing.
19. Provide instrumentation, computer, software, and communication resources necessary to demonstrate total operation of building systems and control system equipment during Deferred Seasonal Testing.
20. Participate in a Warranty Review of system/equipment performance. Correct any deficiency issues noted during warranty period per the Project Warranty Process.

F. Test, Adjust and Balance (TAB) Contractor (Design Build):

1. Attend commissioning kick-off meeting and other commissioning team meetings.
2. Prepare Owner Training Program with GC (see paragraph 1.9).
3. Submit TAB Plan and forms describing methodology for execution of test and balance procedures specific to this project in Start-Up Plan for CxA review.
4. Cooperate with CC with execution of required work.
5. Submit copy of final TAB report to CxA for review prior to start of functional testing.
6. Rebalance deficient areas identified during commissioning.
7. Provide on-site technician and equipment, as necessary, skilled in TAB procedures to provide verification of equipment and system performance during Functional Performance Testing (including equipment operations and control point, sensor and actuator verifications).
8. Provide on-site technician and equipment, as necessary, skilled in TAB procedures to provide verification of Final TAB Report air and water readings during Functional Performance Testing. Allow 16 hours over a single two consecutive day testing period for Final TAB Report verifications.
9. Provide on-site technician and equipment, as necessary, skilled in TAB procedures to provide verification of equipment and system performance and to correct any TAB deficiencies identified during Post Functional Performance Testing Cx-PMOR monitoring.
10. Prepare and submit Operation & Maintenance Manuals for CxA review.
11. Submit Systems Manual documentation to CxA (see paragraph 1.10).
12. With GC; execute training per Owner Training Program.
13. Provide on-site technician and equipment, as necessary, skilled in TAB procedures to provide verification of equipment and system performance during Deferred Seasonal Testing.
14. Participate in a Warranty Review of system/equipment performance. Correct any deficiency issues noted during warranty period per the Project Warranty Process.

3.4 COMMISSIONING TEAM (CT) MEETINGS

A. CT meetings will be held periodically as determined by CxA with frequency increasing as construction advances and systems become operational. Attendance is mandatory. CxA will record minutes and attendance. CxA will chair CT Meetings.

B. Discussions held in CT meetings shall include, but not be limited to system/equipment start-up, progress, scheduling, testing, documentation, deficiencies and problem resolution.

3.5 REPORTING

A. CxA will provide regular status reports to GC and Owner, with increasing frequency as construction and commissioning progresses.

B. CxA will regularly communicate with members of commissioning team, keeping them apprised of commissioning progress.

C. CxA shall submit non-compliance and deficiency reports to Owner and GC.

D. CxA shall provide a final summary report to Owner.

3.6 PRE-FUNCTIONAL CHECKLISTS

A. The objective of the Pre-Functional Checklist is to verify and document that the equipment/systems are provided and installed according to documented design intent and Contract Documents.

B. Pre-Functional Checklists are provided by the CxA and executed as the work is completed in phases by the CxA. Sample copies of Pre-Functional Checklists are included at the end of this specification. The sample copies are provided to give the Sub-contractors a general idea of the work required to complete the pre-functional checklists. The Pre-Functional Checklists included are prototypical, and do not reflect specific requirements of this project's plans or specification. Specific pre-functional checklist items may be added, modified or deleted in the Cx plan delivered to the Sub-contractor in order to reflect the final construction document requirements. GC and Sub-contractors shall review final construction documentation for applicable details and specifications related to equipment to be commissioned in order to fully ascertain all of the pre-functional checklist requirements.

C. The CxA will execute the Pre-Functional Checklists utilizing a "cloud-based" database called "Building Start".

D. The CxA will execute the Pre-Functional Checklists in phases as work is completed such as setting equipment, piping equipment, insulating it, making up electrical connections, etc. The purpose is to execute the commissioning process and complete the checklists as the work is being completed and not to wait until the end of the installation to complete the checklists.

E. Any Pre-Functional Checklist deficiency items noted by the CxA during periodic site visits will be forwarded to the GC/Sub-contractors via the "Building Start" database and in written Site Visit Reports. The Sub-contractors shall correct the deficiency items and notify the CxA when the items are corrected and ready for CxA verification by updating the deficiency item status via the "Building Start:" database. Once the CxA is notified that a deficiency item has been corrected, the CxA will verify the correction and update the item (note as corrected) in the "Building Start" database. Any Pre-Functional Checklist deficiency item marked as corrected by the Sub-

contractor which is later found to be incomplete and causes re-verification work by CxA will be back-charged to the responsible party.

F. The Pre-Functional Checklists must be 100% complete in "Building Start" - *including any deficiency corrections noted from CxA sample verifications* - prior to scheduling Functional Performance Testing. CxA will review "Building Start" deficiency report to determine if outstanding items prevent scheduling of Functional Performance Testing.

G. Any Pre-Functional Checklist item marked as complete which is later found to be incomplete and causes delays during Functional Performance Testing will be back-charged to the responsible party.

3.7 START-UP AND INITIAL CHECKOUT

A. GC/Sub-contractors shall schedule all required systems testing and equipment start-up with Commissioning Team. Sub-contractor shall execute equipment start-up per the Start-Up Plan (see paragraph 1.8 above).

B. GC/Sub-contractor to prepare an overall schedule of testing and start-up activities in advance and forward to CxA so that CxA can witness start-up activities as required.

C. GC/Sub-contractors shall provide CxA with signed and dated copy of completed Start-Up Plan documents prior to start of functional testing. Only individuals having direct knowledge that a line item task was actually performed will initial or check that item off.

D. GC/Sub-contractor shall clearly list outstanding items or start-up tests that are not completed successfully. Completed forms documenting any outstanding deficiencies shall be provided to CxA within two working days of completion.

E. GC/Sub-contractors shall submit an updated start-up report and Statement of Correction on any incomplete or non-compliance report.

F. Any start-up testing marked as complete which is later found to be incomplete and causes re-verification work by CxA or delays during Functional Performance Testing will be back-charged to the responsible party.

3.8 PERFORMANCE MONITORING, OPTIMIZATION, AND REPORTING (Cx-PMOR) SYSTEM

A. Objectives and Scope:

1. This project will utilize a cloud-based SaaS (Software as a Service) Commissioning, Performance Monitoring, Optimization, and Reporting (Cx-PMOR) system which is provided by the CxA. The system shall be utilized during three distinctive phases of the project: Construction, Acceptance, and Warranty Phase.

B. Construction Phase - System Readiness:

1. The Cx-PMOR system will be utilized prior to Functional Performance Testing in order to gauge the readiness of the systems to be tested.

2. At least 7 days prior to the scheduled start of Functional Testing the Building Automation System (BAS) shall have delivered two weeks of operating data to the Cx-PMOR system. If the BAS communication capabilities are not complete sufficiently to enable the BAS to email trend reports then the Controls Contractor shall manually generate two weeks trend data to a report. This manual report shall utilize the **SAME EXACT REPORT FORMAT** approved for the permanent reporting. This manual report shall either be emailed to the CxA or shall be emailed to the project's specific Cx-PMOR email account.
3. Following receipt of two weeks of operating data (either automatically or manual) the CxA shall review the data utilizing the Cx-PMOR system to assess the readiness of the specific system to begin on-site Functional Testing.
4. The CxA shall notify the project team of the any deficiencies identified by the trend data analysis that would need to be addressed prior to beginning Functional Testing.

C. Acceptance Phase – Post Functional Test Monitoring:

1. The Cx-PMOR system shall be utilized following on-site Functional Testing to assess dynamic operation stability and to ensure the systems operate properly under varying load conditions and occupancy modes. This is a limited length testing and is intended to be conducted for a short period (approximately two weeks) prior the completion of the formal Functional Testing.
2. Any deficiencies identified during this monitoring period shall be added to the project Commissioning Issue Log to be addressed by the Contractor as construction deficiencies. Some deficiencies identified by this monitoring may require supplemental on-site Functional Testing to be performed at the cost of the GC. Time and expenses for CxA to complete supplemental Functional Performance Testing to verify corrections of these deficiencies will be considered Additional Services to be paid by the GC (refer to paragraph 3.10).

D. Warranty Phase – Monitoring:

1. The Cx-PMOR system will be utilized during the first year following substantial completion to monitor the performance of the building and the individual systems.
2. Any operational deficiency identified by the system will be documented using the system's online Issue Log and the deficiency will be resolved through the contract's Project Warranty process.
3. At eleven months following substantial completion the CxA shall provide a comprehensive review of the system operation using the Cx-PMOR system to analyze the data provided from the BAS. An updated Warranty Phase Issue Log shall be generated and the Contractor shall resolve all issues determined by the team to be subject to Warranty requirements.

3.9 FUNCTIONAL PERFORMANCE TESTING

A. Objectives and Scope:

1. The objective of Functional Performance Testing is to demonstrate each system is operating according to documented design intent and Contract Documents. Functional Performance Testing facilitates bringing systems from a state of substantial completion to full dynamic operation. Additionally, during Functional Performance

Testing, areas of deficient performance are identified and corrected, improving operation and functioning of systems.

2. Each system shall be operated through all modes of operation (occupied, unoccupied, warm-up, cool-down, etc.) where there is a specified system response. Verifying each sequence in the sequences of operation is required.
3. The Functional Performance Testing specified herein is separate from and in addition to any other start-up, demonstration, or commissioning required in other sections of the project specifications.
4. The CxA will document the Functional Performance Testing utilizing the "Building Start" database.

B. Development of Test Procedures:

1. The purpose of any given specific test is to verify and document compliance with stated criteria of acceptance given on test form. CxA shall develop specific test procedures and forms to verify and document proper operation of each piece of equipment and system. Sub-contractor responsible to execute test will provide limited assistance to CxA in developing procedure (i.e. answering questions about equipment, operation, sequences, etc.). Prior to execution, CxA shall provide a copy of test procedures to Sub-contractor. Sub-contractor will review tests for feasibility, safety and equipment warranty protection. CxA shall submit tests to Owner, GC and A/E and other commissioning team members for review.
2. Test procedure forms developed by the CxA will include (but not be limited to) the following information:

   a. System and equipment or component name(s)
   b. Equipment location and ID number
   c. Date
   d. Project name
   e. Participating parties
   f. Specific sequence of operation or other specified parameters being verified
   g. Instructions for setting up test
   h. Specific step-by-step procedures to execute test, in a clear, sequential and repeatable format
   i. A Yes/No checkbox to allow for clearly marking whether or not proper performance of each part of test was achieved
   j. Section for comments

3. Sample copies of Functional Performance Test (FPT) forms are included at the end of this specification. The sample copies are provided to give the Sub-contractors a general idea of the work required to complete the FPT. The FPT checklists included are prototypical, and do not reflect specific requirements of this project's plans or specification. Specific FPT items may be added, modified or deleted in the Cx plan delivered to the Sub-contractor in order to reflect the final construction document requirements. GC and Sub-contractors shall review final construction documentation for applicable details and specifications related to equipment to be commissioned in order to fully ascertain all of the FPT requirements.

C. Initial Control Systems Checkout:

1. The control systems must be verified for correct operation by the Control System Sub-contractor *prior to the CxA witnessing and documenting the Functional Performance Tests*. The CxA Functional

Performance Tests are not intended to be quality control or "beta" testing of the control systems.

2. The Control Systems Sub-contractor shall sign/initial and date the "Master" copy of the Cx Plan FPT forms prior to verification by CxA. Only individuals having direct knowledge that a line item task or sequence of operation was actually performed or checked will initial or check that item off. The Control Systems Sub-contractor shall list any FPT sequences or items not completed successfully utilizing the notes section of the FPT form. These notes shall clearly indicate why the item or sequence was not completed or operated as indicated on the FPT form. Completed FPT forms documenting any outstanding deficiencies shall be provided to CxA within two working days of "sign-off" by the Control Systems Sub-contractor.
3. The intent of this process is for the Control Systems Sub-contractor to physically check and verify proper equipment and integrated systems operation for all operational sequences prior to the CxA witnessing and documenting the actual Functional Performance Testing.

D. Coordination and Scheduling:

1. GC will provide sufficient notice to CxA regarding completion schedule for equipment and systems. GC will schedule Functional Performance Tests with CT. CxA shall witness and document functional testing of equipment and systems. Sub-contractor shall execute tests under direction of CxA.
2. GC must allow sufficient time in the Construction Schedule to complete the Functional Performance Testing prior to turning the building over to the Owner (including any Owner move-in activities). This includes completing the Commissioned Systems Installations (PFCs), Testing, Start-Up, and all prerequisites required for Functional Performance Testing. Time and expenses for CxA to complete Functional Performance Testing after Owner occupancy/move-in will be considered additional services to be paid by the GC (refer to paragraph 3.10).
3. Functional Performance Tests are integrated systems tests. For example, the Fire Alarm System must be complete and ready for operation in order to test the Air Handling Unit Fire Alarm shutdown sequence. All equipment and systems associated with a Functional Performance Test must be complete and ready for testing.
4. In general the Functional Performance Testing will be organized/scheduled based on the following hierarchy:

    a. Project completion. Some areas of the building may be complete before other areas. Priority will be given to these area systems assuming they can be grouped together for integrated systems testing.
    b. Integrated systems. In general the testing will be organized into groups of integrated systems from larger systems down to smaller systems (e.g. chilled water system, air handling system, terminal units, etc.).
    c. Systems with limited integration and "stand alone" systems (e.g. unit heater or fan only being monitored by the building control system).

5. Functional Performance Tests will be grouped together to allow testing to be conducted over weekly testing periods to maximize testing efficiencies. Single system testing spread out over multiple testing weeks will not be allowed. In general, the testing will begin on Monday and end on Friday afternoon. The

actual testing hours will be coordinated with the GC/Sub-contractors based on the amount of testing work to be completed during that week. GC/Sub-contractors should be prepared to work from 8:00AM to 5:00PM each day to complete the testing for that weekly period.

6. Some systems may require testing after normal working hours (e.g. Lighting Controls, etc.) to avoid conflicts with ongoing work or adjacent building operations. This testing will be scheduled for evenings (Monday – Thursday) or early mornings (Tuesday – Friday). Weekend testing will only be allowed if agreed upon by CT in advance.

E. Prerequisites for Functional Performance Testing:

1. Pre-Functional Checklists must be 100% complete in "Building Start" – *including any deficiency corrections noted from CxA sample verifications* – as a prerequisite to scheduling Functional Performance Tests.
2. The GC/Sub-contractors must submit the fully executed Start-Up Plan electronic PDF files including all equipment and systems testing documentation (e.g. duct and piping pressure testing, cleaning/flushing documentation, etc.), and all executed start up and initial check-out documentation as a prerequisite to scheduling functional performance tests.
3. The TAB Sub-contractor shall complete all test and balance work and submit final Test and Balance report for review by A/E and CxA prior to start of Commissioning Functional Testing. A/E shall review final test and balance report for acceptance. CxA review of final TAB report is cursory (not for acceptance) and is primarily intended to insure that the equipment and systems are ready to be functionally tested.
4. The control Sub-contractor must submit all control systems start-up and initial checkout documentation (including point-to-point verifications, etc.) as a prerequisite to scheduling functional testing.
5. The GC/Control Sub-contractor must submit executed copies of the commissioning functional tests (signed and dated by the control Sub-contractor technician directly responsible for verification of the control sequence or system operation) to the CxA as a prerequisite to scheduling functional testing (to show that the control Sub-contractor has actually tested and verified each sequence prior to CxA witnessing the functional testing).
6. The GC/Control Contractor must complete BAS system trending data set-up and reporting set-up for Cx-PMOR System and submit two weeks of operating data (either automatically or manually) for CxA review to assess the readiness of the specific system to begin on-site Functional Testing. Operating data must be submitted at least 7 days prior to anticipated start of Functional Testing.
7. Operations & Maintenance Manuals must be submitted and approved prior to conducting Functional Performance Tests.
8. The GC must submit the final schedule of Owner Training exercises to the CxA prior to conducting Functional Performance Tests.
9. GC/Sub-contractors must submit Systems Manual documentation to the CxA prior to conducting Functional Performance Tests.

F. Test and Balance (TAB) Verification:

1. CxA will verify Final TAB Report air and water readings for randomly selected spaces as follows. Allow 16 hours (conducted over a single two consecutive day testing period) for Final TAB Report verification readings.

2. TAB Sub-contractor will re-read devices with the same equipment used in the TAB process in the presence of the CxA. The CxA will record the TAB Verification readings. All TAB Verification readings must be within ±10% of Final TAB Report readings.
3. Readings outside of the ±10% tolerance in more than 10% of the TAB Verification readings will indicate failure of the initial TAB Verification testing and require a Second TAB Verification Test. TAB Sub-contractor will correct all deficient readings and schedule the Second TAB Verification Test with CxA. For randomly selected space testing, the CxA may choose to select different spaces for the Second TAB Verification Test than were utilized in the initial test.
4. Readings outside of the ±10% tolerance in more than 10% of the Second TAB Verification Test will indicate failure of the Second TAB Verification Test and will require a third test. TAB Sub-contractor will correct all deficient readings and schedule Third TAB Verification Test with CxA. The Second TAB Verification Test procedures will be repeated a third time (again, different spaces may be utilized for any random space testing).
5. Readings outside of the ±10% tolerance in more than 10% of the Third TAB Verification Test readings will indicate failure of the Third TAB Verification Test and will require TAB Verification retesting for all of the TAB final report readings (CxA will witness TAB Sub-contractor retake all readings to verify all readings are within the ±10% tolerance).
6. All TAB verification retesting will be completed at no additional cost to the Owner. See paragraphs below for CxA costs for retesting.

3.10 DOCUMENTATION, NON-CONFORMANCE AND APPROVAL OF TESTS

A. Documentation:

1. CxA will witness and document results of FPT using specific Functional Performance Tests developed for that purpose. Prior to testing, FPTs are provided to the Commissioning Team for review and approval. CxA will include filled out FPTs in Commissioning Turnover Package.

B. Non-Conformance:

1. CxA will record results of functional testing. Deficiency or non-conformance issues will be noted and reported to GC and Owner on standard non-compliance FPT form.
2. Corrections of minor deficiencies identified may be made during tests at discretion of CxA. In such cases, deficiency and resolution will be documented on FPT form.
3. Every effort will be made to expedite testing and minimize unnecessary delays, while not compromising integrity of tests. CxA shall not overlook deficient work or loosen acceptance criteria to satisfy scheduling or cost issues unless directed to do so by the Owner.
4. Deficiencies are handled in the following manner:

   a. When there is no dispute on deficiency and Sub-contractor accepts responsibility for remedial action:

      1) CxA documents deficiency and Sub-contractors response and intentions and they go on to another test or sequence. CxA submits deficiency report to GC and

Owner. Copy is provided to Sub-contractor. Sub-contractor corrects deficiency, completes statement of correction form certifying that equipment is ready to be retested and sends it back to GC. GC forwards response to CxA.
2) GC reschedules test with Sub-contractor.

b. When there is a dispute about a deficiency, regarding whether it is a deficiency or who is responsible:

1) CxA documents deficiency and Contractors response and they go on to another test or sequence. CxA submits deficiency report to GC and Owner. Copy is provided to Sub-contractor.
2) GC facilitates resolution of deficiency. Other parties are brought into discussions as needed. Final interpretive authority is with A/E. Final acceptance authority is with the Owner.
3) GC documents resolution process.
4) Once interpretation and resolution has been decided, appropriate party corrects deficiency, signs statement of correction on deficiency form and provides it to GC. GC forwards response to CxA. GC reschedules test and test is repeated until satisfactory performance is achieved.

C. Costs for excessive Deficiency Issue Verifications and Functional Performance Test Delays/Retesting:

1. Cost for Sub-contractor to correct and retest any PFC or FPT deficiency item, if they are responsible for deficiency, will be theirs. If Sub-contractor is not responsible, cost recovery for correcting and retesting will be negotiated with GC.
2. CxA labor and expenses for any of the following will be back charged to the GC at a cost of $2500 per man-day. GC must pay CxA in advance for CxA to schedule reverification or retesting site visits.

a. Excessive Deficiency Issue Verifications (for excessive/repeated issues).
b. Any reverification of a Deficiency Issue when the Issue is marked as corrected by the Sub-contractor and found to remain deficient by CxA on verification.
c. Retesting required because any Functional Performance Test prerequisite (required by paragraph 3.9-E) reported to have been successfully completed by the GC/Sub-contractor is found to be faulty or incomplete during Functional Performance Testing.
d. Delays during Functional Performance Testing caused by excessive or repeated testing failures.
e. Any Deficiency Issue Verifications after Substantial Completion and/or Owner occupancy.

D. Cost for TAB Verification Retesting:

1. Cost for TAB Sub-contractor to correct and retest any TAB deficiency item, if they are responsible for deficiency, will be theirs. If TAB Sub-contractor is not responsible, cost recovery for retesting will be negotiated with GC.
2. CxA labor and expenses for any TAB Verification retesting will be back charged to the GC at a cost of $2500 per man-day. GC must

pay retesting costs to CxA in advance for CxA to schedule retesting site visits.

E. Costs for Functional Performance Test Additional Services:

1. Cost for GC/Sub-contractor to complete Functional Performance Testing Additional Services will be theirs.
2. Additional Services for CxA to complete supplemental Functional Performance Testing to verify corrections of deficiencies identified during Acceptance Phase Post Functional Performance Testing Cx-PMOR Monitoring will be paid for by the GC at a cost of $2500 per man-day. GC must pay retesting costs to CxA in advance for CxA to schedule retesting site visits.
3. Additional Services for CxA to complete ***any*** Functional Performance Testing during Owner move-in or after Owner occupancy (regardless of whether the testing was attempted prior to that point or not) will be paid for by the GC at a cost of $2500 per man-day. GC must pay testing costs to CxA in advance for CxA to schedule testing site visits after Substantial Completion and/or Owner occupancy.

F. Approval:

1. CxA notes each satisfactorily demonstrated function on test form. CxA, A/E and Owner provide formal approval of FPT. CxA recommends acceptance of each test to Owner. The Owner gives final approval, providing a signature to GC and Sub-contractor.

3.11 TRAINING OF OWNER PERSONNEL

A. GC/Sub-contractors/Vendors will provide complete training in start-up, operation and maintenance of all equipment under contract.

B. GC will hold a meeting with the Sub-contractors/Vendors, and Owner's Facility Staff to review the Owner training requirements, preparation of Owner Training Program (see paragraph 1.9) and coordinate scheduling of the Owner training sessions.

C. GC and Sub-contractors will be responsible for developing Owner Training Program, scheduling of Owner training, execution of Owner training and documentation of completed Owner training.

D. CxA will monitor the completion of the Owner training by attending a sampling of the Owner Training sessions and reviewing the final executed Owner Training Program documentation.

E. GC schedules training with CxA, Owner and Sub-contractors.

F. GC will submit a copy of the final executed Owner Training Program including all training documentation (sign-in sheets, hand outs, etc.) to CxA on completion of Owner Training exercises.

3.12 DEFERRED SEASONAL TESTING

A. Peak Season Performance Testing:

1. During warranty period, seasonal testing (tests delayed until weather conditions are closer to system's design) will be

completed as part of this contract. Deferred Seasonal Tests are separate from and in addition to Functional Performance Testing. GC will coordinate this activity.

2. One Deferred Seasonal Test will be conducted (during peak season opposite initial CxA Functional Performance Testing). Only seasonally impacted sequences and capacities will be retested during the Deferred Seasonal Test (e.g. AHU safeties and fire alarm interlocks will not be retested during the Deferred Seasonal Test).
3. Deferred Seasonal Tests are scheduled by the GC/Sub-contractors.
4. Deferred Seasonal Tests are executed by Sub-contractors, under supervision of and documented by CxA.
5. CxA will provide Deferred Seasonal Test updates for insertion in Final Commissioning Report as necessary.

3.13 END OF WARRANTY PERIOD MEETING

A. CT will participate in a warranty period meeting with the owner and O&M staff to review the facility and its performance. The meeting will be held 10 months into the one year warranty period.

B. This Warranty Review meeting shall address:

1. Any outstanding construction deficiencies.
2. Any deficiencies that were noted by the operations staff during the warranty period.
3. Any problems noted by the operations staff related to operating the facility as originally intended.
4. Any operational issues noted by Cx-PMOR process during warranty period.

C. CxA will provide a written report of the End of Warranty meeting. Report will include a responsibility matrix or plan for resolving any issues determined by the team to be subject to Warranty requirements.

3.14 COMMISSIONING DOCUMENTATION

A. Commissioning Turnover Package:

1. CxA is responsible to compile and organize commissioning records. CxA shall deliver Cx records to the Owner in Commissioning Binders. Turnover Package to include the following:

a. Commissioning Plan
b. Pre-Functional Checklists (completed by Sub-contractors)
c. Completed Functional Performance Test records
d. Deficiency Reports
e. Final Commissioning Report

B. Final Report Details:

1. Final commissioning report will include an executive summary, list of participants and roles, brief building description, overview of commissioning and testing scope and general description of testing and verification methods. Report will contain evaluation regarding disposition of equipment, systems and documentation in the following areas:

a. Conformance to specifications and design intent.
b. Equipment installation.
c. Functional performance.

2. All outstanding non-compliance items will be specifically listed.
3. Recommendations for improvement to equipment or operations, future actions, etc. will also be listed.
4. Each non-compliance issue will be referenced to specific FPT where deficiency is documented.
5. Sections will be provided for End of Warranty Meeting minutes to be inserted at a later date.

END OF SECTION 01 91 00
SAMPLE PRE-FUNCTIONAL CHECKLISTS AND FUNCTIONAL PERFORMANCE TESTS FOLLOW

SAMPLE AIR HANDLING UNIT PRE-FUNCTIONAL CHECKLIST

VAMC Tampa - Phase 4 New Bed Tower and Infrastructure Improvements

Date:
Unit #:
Area Served:
Location:

NOTE SAMPLE ONLY - REFERENCES ARE NOT PROJECT SPECIFIC

Model Verification			
Manufacturer	1		1=specified
	2		2=installed
Model	1		
	2		
serial #			
SF Electrical	1		
	2		
SF Starter	1		
	2		
Pre-filters	1		
	2		

General	**Comp. Y/N**
Equipment cleaned and properly labeled with 4.5"x6" engraved laminated plastic per 15075-2.1	
Fan installed on open-spring vibration isolation per 15725-2.4.J	
Inspection and access doors are operable	
Casing undamaged	
Stainless steel TAQ drain pan	
Manufacturer's required maintenance clearance provided.	
Any damage to coil tubing or fins has been repaired.	
Filters	**Comp. Y/N**
Disposable filters clean and in place.	
No gaps to allow air bypass around filters.	
Unit (as specified per 15725)	**Comp. Y/N**
Condensate drainage is unobstructed (Visually verify drainage by pouring a cup of water into drain pan.)	
Unit controlled via wall mounted thermostat ??	
Suspended with spring isolators per 15071	
Dampers installed and operational.	
Piping	**Comp. Y/N**
Piping installed at unit with flex connectors.	
Chilled water piping installed (no detail): supply, shutoff valve, strainer w/blowdown, union, thermometer, pressure gauge, flex, coil with air vent, flex, pressure gauge, thermometer, union, 2-way control valve, flow control device	
Hot water piping installed (no detail): supply, shutoff valve, strainer w/blowdown, union, thermometer, pressure gauge, flex, coil with air vent, flex, pressure gauge, thermometer, union, 2-way control valve, flow control device	
Insulation and Labeling	**Comp. Y/N**
Chilled water piping insulated 2" cellular glass per 15080-3.15	
Hot water piping insulated 2" mineral fiber per 15080	
Condensate piping insulated 1" mineral fiber per 15080	
All piping properly color coded per existing and labeled.	
Electrical	**Comp. Y/N**
Power available to unit control panel	
Proper motor rotation verified	
Electrical overloads installed & sized correctly	
Verify that power disconnect is located within sight of the unit controls and labeled	
Installation Inspection and testing	**Comp. Y/N**
Unit inspected by factory authorized rep. and report provided per 15725-3.4	
Installation of system and balancing devices allowed balancing to be completed following accepted procedures and contract documents	

SAMPLE AIR HANDLING UNIT PRE-FUNCTIONAL CHECKLIST

VAMC Tampa - Phase 4 New Bed Tower and Infrastructure Improvements

Date:
Unit #:
Area Served:
Location:

NOTE SAMPLE ONLY - REFERENCES ARE NOT PROJECT SPECIFIC

Operational Checks (These augment mfr's list. This is not the functional performance testing.)	**Comp. Y/N**
The HOA switch properly activates and deactivates the unit	
Fan rotation verified correct	
No unusual noise or vibration	
No leaking apparent around fittings	
Specified sequences of operation and operating schedules have been implemented	
Specified point-to-point checks have been completed for this system	
Startup report completed with this checklist attached. (Includes full listing of all internal settings with notes as to which settings are BAS controlled or monitored and which are integral.	
Startup report includes written certification from tower manufacturer that all specified features, controls and safeties have been installed and are functioning properly and that the installation and application comply with the manufacturer's recommendations.	
Notes	
(enter date)	
Present were:	

SAMPLE CHILLED WATER PUMP PRE-FUNCTIONAL CHECKLIST *VAMC Tampa - Phase 4 New Bed Tower and Infrastructure Improvements* Date: Unit #: Location: *NOTE SAMPLE ONLY - REFERENCES ARE NOT PROJECT SPECIFIC*			
Model Verification			
Manufacturer	1		1=As Specified
	2		2=As installed
Model	1		
	2		
Serial #	2		
Capacity;	1		
Feet of Head	2		
Elect	1		
	2		
Type	1		
	2		
Starter type	1		
	2		
Reference		**General Installation**	**Comp. Y/N**
M10G.1		Pump is mounted on a 4" housekeeping pad	
15185 3.4 D		Pump has been grouted, and bolts tightened	
Construction Standard		Pump / Motor alignment verified	
15071 3.7; ME 500		Pump is isolated and mounted on concrete inertia base with open spring isolators	
15071 3.2 C		All isolated equipment is also equipped with seismic snubbers	
Construction Standard		Pump and motor lubricated	
No Detail		Suction diffuser has support brace from floor	
Reference		**Piping**	**Comp. Y/N**
No Detail		Piping Train from Suction Side:16" Branch from main, Isolation valve, flexible inlet at suction, suction diffuser, discharge flexible connection, triple duty valve	
No Detail		Suction diffuser has drain connection with 1 ¼" drain line with isolation valve piped to floor drain	
No Detail		Pump has pressure gauge mounted across suction and discharge with multiple input selector switches	
15185 3.5 B		Pump is accessible for maintenance	
15185 3.3 D		Weight of piping and pumps are supported independently	
15185 2.4 A		Suction diffuser for pump is supported at floor	
Construction Standard		Pipe fittings complete	
15071 3.7		Piping supported (w/spring isolators or resilient vertical supports) to 3 hangers from the pump	
15122 2.6		Pressure gauge is dry type (bourdon tube), with 4 ½" dial and range equal to 2 times operating pressure with needle valve fitting and siphon fitting	
Reference		**Labeling**	**Comp. Y/N**
15075 2.1 B		Pump is properly labeled: ½" Letters on 4 ½" x 6" Engraved Plastic Marker with Equipment Name	
15075 2.01 A		Pump Nameplate from manufacturer is visible and indicates: model number, serial number, capacities and essential data.	
16075 2.6		VFD and disconnects labeled with minimum ¾" high letters	
15075 3.3 A		Condenser Water Piping marked or stenciled with Service/Contents and arrow indicating flow direction at wall/floor penetrations, and at least every 25'.	
15075 3.5 B		Valves marked with 1 ½" round tags	
15075 3.6 A		Valve Schedule mounted on wall in room and valves are on valve schedule	
Reference		**Electrical and Controls**	**Comp. Y/N**
15171 2.4 G 11		VFD mounted with the following items on the enclosure door:	
		Power "ON" light.	
		Drive "Trip" pilot light	
		Manual/Off/Automatic three position	
		Manual speed potentiometer for operation in the manual mode	
		Speed indicator calibrated for 0 - 100 % speed	
ME 500		Non Fused Disconnect Switch	
Construction Standard		VFD hooked up to BMS and Functional	
ME 500		HOA Switch is located in VFD Cover	
EP10G.1		VFD wired to Chiller Shutdown Panel	
ME500		VFD's provided with soft start type bypass contactor	

SAMPLE CHILLED WATER PUMP PRE-FUNCTIONAL CHECKLIST

VAMC Tampa - Phase 4 New Bed Tower and Infrastructure Improvements

Date:
Unit #:
Location:

NOTE SAMPLE ONLY - REFERENCES ARE NOT PROJECT SPECIFIC

Reference	Electrical and Controls	Comp. Y/N
Construction Standard	All electric connections tight	
Construction Standard	Proper grounding installed for components and unit	
Construction Standard	Motor overloads sized and installed correctly	
Construction Standard	Control system interlocks hooked up and functional	
Reference	**Flushing and Testing**	**Comp. Y/N**
Construction Standard	Installation of system and balancing devices allowed balancing to be completed following accepted procedures and contract documents	
15082 3.3 O 3,6	Chilled Water Pump housing and pump suction diffuser insulated: Type and thickness unspecified	
15083 3.13 H	CHW Piping properly insulated: 2" Mineral Fiber insulation with vapor barrier	
15181 3.8 B 5	CHW Piping hydrostatic pressure tested for at least 10 minutes	
15181 3.10 A	CHW System cleaned/flushed with clean water	
Reference	**Operational Checks** (These augment mfr's list. This is not the functional performance testing.)	**Comp. Y/N**
	The HOA switch properly activates and deactivates the unit	
	Pump rotation verified correct	
	Operation is quiet, no unusual noise or vibration	
	Piping is leak free, no leaking apparent around fittings	
	Specified sequences of operation and operating schedules have been implemented with all variations documented	
	Specified point-to-point checks have been completed and documentation record submitted for this system	
Notes		
Present were:		

SAMPLE AIR HANDLING UNIT FUNCTIONAL PERFORMANCE TEST

VAMC Tampa - Phase 4 New Bed Tower and Infrastructure Improvements

Date:
Unit #:
Area Served:
Location:

NOTE SAMPLE ONLY - REFERENCES ARE NOT PROJECT SPECIFIC

Pre-test setpoints

Parameter	Pretest Value	Returned to pretest setpoint
CHW valve	auto	
SAT	52	
Dirty Filter Stpt	Pre=0.5"; Final=1.2"	
Hi-limit	4 in.	
FZ-1	38	

Mode	Test Procedure	Expected response	Comp. Y/N
Fan Off	The unit is commanded off by the FMS	Verify by visual response that:	
		1. Interlocked primary EFs stop	
		2. Supply fan stops	
		3. Outside air dampers closed	
		4. CHW valves are closed	
		5. Hot water Preheat valve closed , open if OAT<35	
		6. Hot water Reheat valve closed , open if OAT<35	
		7. HVAC Control system & graphic updates to indicate condition	
Fan Start	The unit is commanded on by the FMS	Verify by visual response that:	
		Supply and Return Fans HOA is in auto	
		1. Interlocked EFs start	
		2. Outside air dampers open	
		3. Supply fan starts	
		4. CHW valves modulate to maintain SA temperature	
		5. Heating coil valves modulate to control SA temperature	
		6. Alarms/sensors (FZ, Filter, etc.) operational	
		7. HVAC Control system & graphic updates	
OA damper failure	Disable the OA damper	Verify by visual response that:	
		1. Unit shuts down	
		2. Unit requires reset ant the operator's terminal	
		3. HVAC Control graphic updates to indicate each condition	
SA fan control	Vary the static pressure sensor setpoint	Verify by visual response that:	
		1. Supply Fan VFD modulates fan speed as required to maintain static pressure sensor setpoint.	
		2. HVAC Control system & graphic updates to indicate each condition	
SAT control - summer	1. Record SAT setpoint	Verify by visual response that:	
		1. Chilled water valves modulate to maintain setpoint within +/- 0.5%. Setpt = _____ Actual= _____	
		2. SAT is limited by a SA low limit	
	2. Vary the SAT setpoint	3. Setpoint changed to _____ Actual=_____	
		4. Time from adjustment to steady state at new setpoint	
		5. HVAC Control system & graphic updates to indicate each condition	
Preheat coil control OAT<35	1. Vary the SAT by changing the setpoints.	Verify by visual response that:	
		1. Preheat coil valves modulate to maintain setpoint within +/- 0.5%. Setpt = _____ Actual= _____	
		2. SAT is limited by a SA high limit	
		3. Setpoint changed to _____ Actual=_____	
		4. Time from adjustment to steady state at new setpoint	
		5. HVAC Control system & graphic updates to indicate each condition	
Heating coil control OAT>35	1. Vary the SAT by changing the setpoints.	Verify by visual response that:	
		1. Heating valve modulates to maintain setpoint within +/- 0.5%. Setpt = _____ Actual= _____	
		2. Setpoint changed to _____ Actual=_____	
		3. Time from adjustment to steady state at new setpoint	
		4. HVAC Control system & graphic updates to indicate each condition	
Freezestat	Spray compressed air on sensor.	Verify by visual response that:	
		1. Unit shuts down	
		2. Unit requires reset ant the operator's terminal	
		3. HVAC Control graphic updates to indicate each condition	

SAMPLE AIR HANDLING UNIT FUNCTIONAL PERFORMANCE TEST

VAMC Tampa - Phase 4 New Bed Tower and Infrastructure Improvements

Date:
Unit #:
Area Served:
Location:

NOTE SAMPLE ONLY - REFERENCES ARE NOT PROJECT SPECIFIC

Mode	Test Procedure	Expected response	Comp, Y/N
EF Fan Status	1. Shutdown EF 2 Restart EF	Verify by visual response that:	
		1. FMS indicates EF is off via DP sensors or current sensing relays	
		2. FMS indicates EF is on via DP sensors or current sensing relays	
		3. HVAC Control graphic updates to indicate each condition	
Mode	**Test Procedure**	**Expected response**	**Comp, Y/N**
Pre -Filter Alarm operation	Override the value of the 1. "dirty" setpt to initiate alarm. 2. Reset setpt to normal.	Verify by visual response that:	
		1. An alarm is initiated in the FMS	
		2. Alarm automatically clears	
		3. HVAC Control graphic updates to indicate each condition	
Supply smoke detected	1. Alarm in zone or SA smoke/fire damper closes	Verify by visual response that:	
		1. Supply fan shuts down	
		2. OA damper closes	
		3. Return fan operates	
		4. HVAC Control graphic updates to indicate each condition	
Comments:			

SAMPLE EMERGENCY GENERATOR FUNCTIONAL PERFORMANCE TEST

VAMC Tampa - Phase 4 New Bed Tower and Infrastructure Improvements

Date:
Generator:
Location:

NOTE SAMPLE ONLY - REFERENCES ARE NOT PROJECT SPECIFIC

Generator Documentation			
Manufacturer	1		1=As Specified
	2		2=As installed
Model	1		
	2		
Voltage	1		
	2		
Capacity / Power Factor	1		
	2		
Generator Serial #	1		
	2		
Alterantor Serial #	1		
	2		

Reference	Generator Control Panel (Verify proper operation of each)	Comp. Y/N
	Monitoring Gauge Panel (dead front, vibration isolated) to include:	
	3-position selector switch (run/off/auto)	
	Local emergency stop button w/ lockout capability	
	Push-button reset switch	
	Voltage adjustment potentiometer	
	Self-diagnostic capabilities with a readout on a digital display panel	
	Alarm horn (and silence switch) and indicating LED's for the following alarms and shutdowns (shutdowns, alarms, and pre-alarms have been tested/verified):	
NFPA-110	Overcrank shutdown - red	
NFPA-110	Low coolant temperature alarm - red	
NFPA-110	High water temperature pre-alarm - amber	
NFPA-110	High water temperature shutdown - red	
NFPA-110	Low oil pressure pre-alarm - amber	
NFPA-110	Low oil pressure shutdown - red	
NFPA-110	Overspeed shutdown - red	
NFPA-110	Low fuel main tank	
NFPA-110	Low coolant level	
NFPA-110	EPS supplying load	
NFPA-110	Controls not in auto	
NFPA-110	High battery voltage	
NFPA-110	Low cranking voltage	
NFPA-110	Low battery voltage	
NFPA-110	Battery charger failure alarm	
NFPA-110	Low starting air pressure	
NFPA-110	Low starting hydraulic pressure	
	Ground fault alarm	
NFPA-110	Lamp Test	
	Panel illumination lights with on/off switch	
NFPA-110	Contacts for local and remote common alarm	

Reference	Generator Control Panel (Verify proper operation of each)	Comp. Y/N
	Control Panel shall include the following meters/gauges (each meter/gauge operational):	
	Running time meter	
	Voltmeter	
	Ammeter	
	Frequency meter	
	Power factor	
	KVAR	
	KWH	
	Battery charging voltmeter	

SAMPLE EMERGENCY GENERATOR FUNCTIONAL PERFORMANCE TEST

VAMC Tampa - Phase 4 New Bed Tower and Infrastructure Improvements

Date:
Generator:
Location:

NOTE SAMPLE ONLY - REFERENCES ARE NOT PROJECT SPECIFIC

Reference	Remote Annunciator Panel (Verify operation of each)	Comp. Y/N
16620P-2.2-G	Remote Annunciator Panel provided w/ battery power provided and includes:	
	Panel illuminating lights for:	
NFPA-110	Overcrank shutdown	
NFPA-110	Low coolant temperature alarm	
NFPA-110	High water temperature pre-alarm	
NFPA-110	High water temperature shutdown	
NFPA-110	Low oil pressure pre-alarm	
NFPA-110	Low oil pressure shutdown	
NFPA-110	Overspeed shutdown	
NFPA-110	Low fuel main tank	
NFPA-110	Low coolant level	
NFPA-110	Controls not in auto	
NFPA-110	Low cranking voltage	
	Ground fault alarm	
	Lamp test switch	
	Alarm horn and silence switch	
Reference	**Testing**	**Comp. Y/N**
NFPA 110	On-site (site-load) installation acceptance test:	
	From "cold start", primary power is disconnected to all ATS's.	
	Time delay on start is recorded	
	Time taken to reach operating speed recorded	
	Voltage and frequency overshoot recorded	
	Time-taken to achieve steady state condition recoreded.	
	100% full load test allowed to run for 2 hours	
	Voltage, frequency, load current, fuel pressure, oil pressure, and coolant temperature recorded for each generator at first load acceptance and in 15 minute intervals thereafter.	
	When primary power is restored, time delay of each ATS to retransfer is recorded.	
	Generator cooldown and shutdown period recorded.	
NFPA-110	At conclusion of site-load test, generator allowed to cool for 5 minutes and started individually and closed to 100% nameplate KW	
NFPA-110	Cranking time until the prime mover starts and runs shall be recorded	
NFPA-110	Time taken to reach operating speed recorded	
NFPA-110	Voltage and frequency overshoot recorded	
NFPA-110	Time taken to reach steady state recorded	
NFPA 110	2-hour load bank resistance test performed:	
	Voltage, frequency, load current, fuel pressure, oil pressure, and coolant temperature recorded (at paralleling gear and at Remote PC) at first load acceptance and in 15 minute intervals thereafter.	
	Visually inspect grounding of generator to verify installation and continuity.	
NFPA 110 / 16620P-2.2-A-2	Starting battery pack is tested to be capable of maintaining cranking speed per NFPA 110 (75 second cranking cycle (15 sec crank, 15 sec rest, 15 sec crank, 15 sec rest, 15 sec crank))	
Notes		
Date Present Were		**MDL/ VERIFIED**
Note 1		
Note 2		

SAMPLE AUTOMATIC TRANSFER SWITCH FUNCTIONAL PERFORMANCE TEST

VAMC Tampa - Phase 4 New Bed Tower and Infrastructure Improvements

Date:
Unit:
Location:

NOTE SAMPLE ONLY - REFERENCES ARE NOT PROJECT SPECIFIC

Mode	Test Procedure	Expected response	Comp. Y/N
Auto start	Open the normal power breaker serving the ATS.	Verify by visual response that:	
		1. ATS LED "Normal Power Available" indicator off.	
		2. The generator receives start signal following time delay to verify loss of utility power.	
		3. Generator is up to speed and voltage within (8) seconds of a loss of utility power.	
		4. ATS LED indicates "Emer Power Available".	
		5. ATS initiates time delay to stagger ATS transitions to emergency power.	
		6. At conclusion of time delay, ATS closes to the emergency position.	
Bypass (E)	Place XFR Switch in bypass (E).	Verify by visual response that:	
		1. Switch bypasses to the emergency source.	
		2. Bypass is a closed transition process	
Isolate from E Bypass	Move isolation handle to "isolate"	Verify by visual response that:	
		1. Transfer switch base is released (for inspection, maintenance, etc.)	
		2. Switch base is capable of being replaced into ATS and taken out of Bypass	
Auto stop	Close the normal power breaker serving the ATS.	Verify by visual response that:	
		1. The ATS indicates that normal power is available and begins time delay to verify stability of normal power.	
		2. At conclusion of (normal power stability) time delay, ATS initiates time delay to stagger ATS transitions to NP.	
		3. At conclusion of time delay, ATS verifies synchronization of normal and emergency sources and transfers load to normal power (momentary closed transition).	
		4. The generator goes thru a 5 minute cool down cycle.	
		5. The generator automatically stops.	
		6. ATS LED "Emergency Power Available" indicator off.	
Bypass (N)	Place XFR Switch in bypass (N).	Verify by visual response that:	
		1. Switch bypasses to the normal source.	
		2. Bypass is a closed transition process	
Isolate from N Bypass	Move isolation handle to "isolate"	Verify by visual response that:	
		1. Transfer switch base is released (for inspection, maintenance, etc.)	
		2. Switch base is capable of being replaced into ATS and taken out of Bypass	
Test start	Activate test switch in face of ATS	Verify by visual response that:	
		1. The generator receives start signal.	
		2. The ATS verifies synchronization of normal and emergency sources and transfers the load to emergency power (momentary closed transition).	
		3. The ATS indicates that both normal and emergency power are available.	
Test stop	Restore test switch to normal in face of ATS.	Verify by visual response that:	
		1. The ATS verifies synchronization of normal and emergency sources and transfers the load to normal power (momentary closed transition).	
		2. ATS indicates both normal and emergency power available.	
		3. The generator goes through a 5 minute cool down cycle.	
		4. The generator automatically stops.	
		5. ATS LED "Emergency Power Available" indicator off.	
Notes			
	Date Present Were		MDL/ VERIFIED
Note	1		
Note	2		

SECTION 01 91 15
BUILDING ENVELOPE COMMISSIONING REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES:

a. The work under this section is subject to requirements of the Contract Documents, including the Owner's General Conditions and articles of the General Contractor's General Conditions.

b. This section includes the commissioning requirements for the Building Envelope systems. Refer to Section 01 91 17 for Building Envelope Functional Performance Testing Requirements.

1. The commissioning requirements for the Building Envelope systems given in this section are entirely separate from, and in addition to, the General Commissioning Requirements for this project. The General Contractor (GC), Subcontractors, and Suppliers are required to participate in both commissioning processes as required and any supplemental General Commissioning requirements.

1.2 GENERAL DESCRIPTION

a. Building Envelope Commissioning (BECx) is a quality based process in which the design and constructed performance of all building envelope materials, components, assemblies, and systems are evaluated and validated to meet the defined objectives and requirements, as defined by the Owner. The BECx process is intended to achieve the following specific objectives according to the Contract Documents:

1. Verify and document the design and installation of the performance of building envelope materials, assemblies, and systems.
2. Endeavor to provide the Owner with functional building envelope systems that meet the Project Requirements.

b. Commissioning does not take away from, or reduce responsibility of, system designers or installing contractors to provide a finished and fully functioning product.

c. This section shall in no way diminish the responsibility of Division 03, 04, 05, 07, 08, and 09 Contractors, Subcontractors, and Suppliers in performing all aspects of work and testing as outlined in the Contract Documents. Any requirements outlined in this section are in addition to requirements outlined in Division 03, 04, 05, 07, 08, and 09.

1.3 RELATED WORK

a. Specific building envelope commissioning requirements are given in this specification. The following specification sections are related to the commissioning work specified in this section:

1. General Commissioning Requirements: Refer to 01 91 00
2. Building Envelope Functional Performance Testing Requirements: Refer to 01 91 17
3. Basic Concrete Requirements: Refer to Division 03
4. Basic Masonry Requirements: Refer to Division 04
5. Basic Thermal and Moisture Protection Requirements: Refer to Division 07
6. Basic Fenestration Systems Requirements: Refer to Division 08
7. Basic Finishing Requirements: Refer to Division 09

1.4 ABBREVIATIONS

a. The following are common abbreviations used in this Section (definitions are found further in this Section):

1. A/E - Architect and Design Team (Design-Build)
2. BECx – Building Envelope Commissioning
3. BECA – Building Envelope Commissioning Agent
4. CxA - Commissioning Agent - Refer to Section 01 91 00
5. GC – Design-Build Contractor
6. CT - Commissioning Team
7. Cx - Commissioning
8. Cx Plan - Commissioning Plan
9. FPT - Functional Performance Test
10. OR - Owner's Representative
11. O&M - Operations & Maintenance
12. RFI - Request for Information

1.5 DEFINITIONS

a. Approval: Acceptance that a material or system has been properly installed and is functioning in tested modes according to the Contract Documents.

b. Architect/Engineer (A/E): See Design Professional.

c. Basis of Design (BOD): The Architect's Basis of Design is comprised of two components: the Design Criteria and the Design Narrative, these documents record the concepts, calculations, decisions, and product selections used to meet the Owner's Project Requirements (OPR) and to satisfy applicable regulatory requirements, standards, and guidelines.

d. Building Envelope Commissioning Agent (BECA): Contracted to Owner and same entity as the CxA. The BECA directs and coordinates day-

to-day building envelope commissioning activities in conjunction with the CxA.

e. Commissioning Agent (CxA): The qualified Commissioning Professional who administers the Cx process by managing the Cx team. Where CxA is used in this manual means the Commissioning Agent, members of his staff or appointed members of the commissioning team. Note that LEED uses the term Commissioning Authority in lieu of Commissioning Agent.

f. Commissioning Issue: Any condition identified by the Commissioning Agent or other member of the Commissioning Team that adversely affects the commissionability, operability, maintainability or functionality of a system, equipment or component. Any condition that is in conflict with the Contract Documents and/or performance requirements of the installed systems and components. (See also – Commissioning Observation)

g. Commissioning Observation: An issue identified by the Commissioning Agent or other member of the Commissioning Team that does not conform to the project OPR, contract documents or standard industry best practices. (See also Commissioning Issue)

h. Commissioning Plan: A document that outlines the scope and defines responsibilities, processes, schedules, and the documentation requirements of the Commissioning Process.

i. Commissioning Team: Individual team members whose coordinated actions are responsible for implementing the Commissioning Process.

j. Contract Documents (CD): Contract documents include design and construction contracts, price agreements and procedure agreements. Contract Documents also include all final and complete drawings, specifications and all applicable contract modifications or supplements.

k. Deficiency: See "Commissioning Issue".

l. Design Professional: The architect(s) or engineer(s) of record of the project.

m. Functional Performance Test (FPT): A written protocol that defines methods, steps, personnel, and acceptance criteria for tests conducted on components, equipment, assemblies, systems, and interfaces among systems.

n. Owner's Project Requirements (OPR): A written document that details the project requirements and the expectations of how the building and its systems will be used and operated. These include project goals, measurable performance criteria, cost considerations, benchmarks, success criteria, and supporting information.

o. Mock-up: The activities where systems or materials are initially constructed and tested. Mock-ups are to be laboratory, free standing, or in-situ as required and approved prior to commencing full scale construction.

p. Specifications: Construction specifications of Contract Documents.

q. Sub-contractor: Contractors of GC, and their Sub-contractors, who provide and install building envelope components and systems.

1.6 COORDINATION

a. Commissioning Team: Members of the Commissioning Team (CT) will consist of:

1. Commissioning Agent (CxA)
2. Building Envelope Commissioning Agent (BECA)
3. Building Envelope Testing Agent (BETA)
4. Owner's Representative(s) (OR)
5. General Contractor (GC) (Design-Builder)
6. Architect and Design Engineers (A/E) (Design-Builder)
7. Building Envelope Subcontractors

b. Management: The CxA and BECA will be the same entity. The BECA will direct and coordinate commissioning activities through the CxA. All members of the Commissioning Team shall cooperate to fulfill contracted responsibilities and objectives of the Contract Documents.

c. Scheduling: BECA will work with the CT to establish required commissioning activities to incorporate in preliminary commissioning schedule. The GC will integrate commissioning activities into a master construction schedule. Necessary notifications are to be made in a timely manner in order to expedite the commissioning process.

1.7 SUBMITTALS

a. A/E or GC shall provide BECA with documentation required for commissioning work. All building envelope related submittals and shop drawings as required by the specifications shall be provided to the BECA for review and comment.

b. The BECA shall review building envelope related submittals and shop drawings prior to or concurrent with the A/E for conformance as it relates to BECx such that the BECA comments can be incorporated into the returned submittal.

c. The contractors shall review all exterior envelope related comments and address as required. Revised shop drawing details based on submittal review comments shall be clearly marked on the shop drawing resubmittal to indicate where and what changes have been made. All submittal and shop drawing review comments shall be tracked by the BECA and include formal, written responses to each comment by the contractors.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 SYSTEMS TO BE COMMISSIONED

a. Building Envelope Systems to be commissioned:

1. Foundations (excluding structural): standard, special, slab-on-grade, vapor barriers, air barriers.
2. Basements: basement walls, crawl spaces, waterproofing, drainage.
3. Superstructure: floor construction, roof construction, sunshades, connections to adjacent structures.
4. Exterior Closure: exterior walls, exterior windows, exterior doors, louvers, grilles and sunscreens.
5. Roofing: roof system (including parapet), roof openings (skylights, pipe chases, ducts, equipment curbs, etc.)
6. Note: the emphasis on commissioning the above building envelope systems is on control of air flow, heat flow, noise, infrared, ultraviolet, rain penetration, moisture, durability, security, reliability, constructability, maintainability, and sustainability.

3.2 RESPONSIBILITIES OF COMMISSIONING TEAM MEMBERS

a. Architect/Engineer (A/E)

1. Assist in the development and documentation of the Owner's Project Requirements document.
2. Develop mock-up drawings or description as required for testing within specification section 01 91 17.
3. Provide brief Basis of Design summary to document the design intent of building envelope systems to the BECA.
4. Review and incorporate Building Envelope Commissioning Requirements specification section and Functional Performance Test specification section into the construction documents.
5. Attend BECx design review meeting and other BECx meetings as required.
6. Provide construction documents electronically.

7. Review and respond to/incorporate BECA comments made during design reviews and submittal/shop drawings reviews.
8. Assist in dispute resolution regarding building envelope systems.
9. Review BECA reports and respond to A/E items.

b. Building Envelope Commissioning Agent (BECA)

Design Phase:

1. The BECA shall review documents developed by the A/E including the Owner's Project Requirements (OPR) document, Design Narrative, and Design Submissions.
2. The BECA shall develop commissioning process requirements for inclusion in the Construction Documents such as submittals, periodic inspections, laboratory testing, field testing, mock-ups of exterior assemblies, and documentation.
3. Develop preliminary construction checklists, pre-functional checklists, and functional performance test procedures.

Construction Phase:

4. Assist with developing construction details for elements not addressed or coordinated during the design phase.
5. Observe field testing, including coordinating the need for additional field testing, alteration of installation details, and resolution of issues identified during field or laboratory testing.
6. Review aesthetic and functional mock-ups; review the interface conditions to verify that they meet the design requirements; verify that the required level of water and air tightness can be achieved; review of iterative repair submittals; and testing prior to actual construction. Coordinate and document the building envelope mock-up testing
7. Conduct submittal reviews of shop drawings, mock-ups, sample constructions, project schedules and sequencing, and building enclosure components to verify the required level of water and air tightness can be achieved.
8. Review of the contractor's site-specific quality plans for the building enclosure.
9. Field verification of actual construction for conformance to design and manufacturers' requirements.
10. Assist in resolution of any issues identified during field reviews or testing.
11. Construction phase meetings shall be scheduled during regularly scheduled BECA site visits.

Operations and Maintenance Phase:

12. Perform Review and comment on contractor's documentation including (a) Operations and Maintenance Manuals; (b) manufacturers' conformance records; (c) field test records; (d) record drawings; (e) exterior envelope preventive maintenance program; and (f) manufacturer's and contractors' warranties.
13. Documentation of non-conforming performance levels relative to exterior closure systems.
14. Verification of exterior closure performance levels prior to warranty expiration.
15. Coordination of corrective actions relative to exterior closure systems.
16. Coordination of seasonal testing of exterior closure systems.
17. Developing the re-commissioning or ongoing commissioning program.

c. General Contractor (GC)

1. Attend BECx coordination/kick-off meeting and other commissioning team meetings. The GC is responsible for all coordination items with Subcontractors.
2. Incorporate commissioning activities into the construction schedule.
3. The GC is responsible for contracting an independent BETA for mock-up, field testing, and any required additional testing due to failures.
4. Periodically update commissioning activities in the construction schedule.
5. Facilitate cooperation of Sub-contractors in commissioning work.
6. Submit copies of initial and final A/E approved submittals for commissioned system equipment to BECA.
7. Review the BECA's shop drawings submittal comments.
8. Verify building envelope materials and assemblies are ready for functional performance testing.
9. Submit maintenance logs of all interim maintenance or repair tasks performed by subcontractors.
10. Submit maintenance logs of all interim maintenance or repair tasks performed by subcontractors.
11. Ensure resolution of non-compliance and deficiencies in construction or test results. Obtain written documentation of completion from the appropriate subcontractors.
12. Provide letters of compatibility for adjacent building envelope materials and assemblies.
13. Facilitate all repairs and retesting of failed functional performance testing and pay for all associated costs, including the costs of retesting.
14. Provide a summary of any repairs performed to any system during mock-up or field testing to the CT. All repairs performed to facilitate successful testing must be approved by the CT and performed comprehensively throughout project.

15. Provide all warranty information to the BECA.

d. Subcontractors/Vendors

1. Review Commissioning Plan and building envelope related specification sections.
2. Provide project specific submittals/shop drawings as required by the project specifications that clearly indicate how each system is interfaced with adjacent systems. All adjacent systems must be detailed accurately.
3. Attend BECx coordination/kick-off meeting and other commissioning team meetings.
4. Notify GC and BECA of work completion.
5. Attend all required material and systems functional performance testing.
6. Ensure installed work is complete, is in compliance with Contract Documents, and is ready for Functional Performance Testing. Notify GC that equipment and systems are ready for Functional Performance Testing. FPT test results will be documented by BECA.
7. Provide all warranty information to the GC.

e. Building Envelope Testing Agency (BETA)

1. Provide on-site technician and equipment to complete mock-up and field Functional Performance Testing.
2. Prepare and submit reports at the conclusion of all testing.
3. Perform retesting as required at previous failed test locations and prepare corresponding reports.

3.3 BUILDING ENVELOPE COMMISSIONING TEAM (BECx) MEETINGS

a. BECx meetings will be held periodically as determined by the BECA.

b. Discussions held in BECx meetings shall include, but not be limited to, system/materials, mock-up/field, progress, scheduling, testing, documentation, deficiencies, and problem resolution.

3.4 REPORTING

a. The BECA will provide periodic status reports to Owner, A/E, GC, and CxA.

b. The BECA shall submit non-compliance and deficiency reports Owner, A/E, GC, and CxA.

c. BECA shall provide a final summary report to Owner.

3.5 MOCK-UP AND FINAL CONSTRUCTION

a. The GC and Subcontractors shall verify completion of assemblies compliant with project documents and deficiency log items prior to functional performance testing or concealment of functional performance layers within the building envelope.

3.6 FUNCTIONAL PERFORMANCE TESTING

a. Objectives and Scope

1. The objective of Functional Performance Testing is to demonstrate each system is operating according to documented design intent and Contract Documents. Functional Performance Testing facilitates bringing systems from a state of substantial completion to fully operational. Additionally, during Functional Performance Testing, areas of deficient performance are identified for the purpose of operation and functioning of systems.

b. Development of Test Procedures

1. The purpose of a specific test is to verify and document compliance of the installed envelope systems with the OPR. The BECA shall develop specific test procedures for inclusion in Specification Section 01 91 17 – Building Envelope Functional Performance Testing Requirements.

c. Coordination and Scheduling

1. The GC shall provide two week minimum notice to the BECA regarding completion of schedule for materials and systems. In general, the BECA will perform site visits during the first installation of each envelope component. The GC will schedule Functional Performance Tests with CT. BECA shall witness and document functional testing of equipment and systems. BETA shall execute tests under direction of GC and BECA.

2. Successful completion of mock-up functional performance testing shall occur prior to installation of building envelope materials and systems on the building.

3.7 DOCUMENTATION, NON-CONFORMANCE, AND APPROVAL OF TESTS

a. Documentation

1. The BECA will witness and document results of FPT.

b. Non-Conformance

1. The BECA will record results of FPT. Deficiency or non-conformance issues will be noted and reported to the GC, A/E, and Owner.

2. Corrections of minor deficiencies identified may be made during tests at discretion of the BECA. In such cases, deficiency and resolution will be documented. All corrected deficiencies must be addressed and corrected at all similar conditions throughout the building.

3. Every effort will be made to expedite testing and minimize unnecessary delays, while not compromising integrity of tests. BECA shall not overlook deficient work or loosen acceptance criteria to satisfy scheduling or cost issues unless directed to do so directly by the Owner.

4. Deficiencies are handled in the following manner:

   a. When there is no dispute on deficiency and Sub-contractor accepts responsibility for remedial action:

      1) BECA documents deficiency and Sub-contractors response and intentions and they go on to another test or installation. BECA submits deficiency report to GC, CxA, and Owner. Copy is provided to Sub-contractor by GC. Sub-contractor corrects deficiency and verifies that material or assembly is ready to be retested. GC informs CT of retesting schedule.

      2) GC reschedules test with BECA and BETA.

   b. When there is a dispute about a deficiency, regarding whether it is a deficiency or who is responsible:

      1) BECA documents deficiency and Contractor's response. BECA submits deficiency report to GC, A/E, and Owner. Copy is provided to Sub-contractor by GC.

      2) GC facilitates resolution of deficiency. Other parties are brought into discussions as needed. Final interpretive authority is with A/E. Final acceptance authority is with the Owner.

      3) GC documents resolution process.

      4) Once interpretation and resolution has been decided, appropriate party corrects deficiency, GC reschedules test, and test is repeated until satisfactory performance is achieved.

c. Testing Failures

1. All failed test specimens shall be repaired and retested until passing results are achieved. For each failure, an additional three (3) tests (above the original amount of testing) will be performed at similar conditions.
2. Costs for all retesting and additional testing due to failure will be the full responsibility of the GC and Subcontractors. These retesting costs include all costs associated with the BECA and BETA site visits and includes all access, equipment, labor, and materials required to complete the retesting.

3.8 COMMISSIONING DOCUMENTATION

a. Final Report Details

1. The final BECx report will include an executive summary, list of participants and roles, brief building description, overview of BECx and testing scope, and general description of testing and verification methods. Report will contain evaluation regarding the conformance to specifications and design intent, the material/system installations, and the functional performance of the building envelope systems.

2. All outstanding non-compliance items will be specifically listed.

3. Recommendations for improvement to system or operations, future actions, etc. will also be listed.

END OF SECTION

SECTION 01 91 17
BUILDING ENVELOPE FUNCTIONAL PERFORMANCE TEST REQUIREMENTS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

a. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section. Division 3, 4, 7, 8 and 9 Specification Sections also apply to this section. Where conflicts arise regarding building envelope testing, this Section shall supersede other Sections where contradictions occur.

b. Refer to Section 01 91 13 for the general Building Systems (Fire Protection, Plumbing, HVAC, Electrical and Security Systems) commissioning requirements.

c. Refer to 01 91 15 for the general Building Envelope Commissioning Requirements.

2.1 TESTING AGENCY

a. Testing agency shall have a minimum five (5) years of experience performing the testing as outlined in this specification section.
b. The General Contractor (Design-Build Team) is fully responsible for contracting an independent testing agency for the building envelope mock-up and field testing requirements outlined within the project specifications. The General Contractor is also responsible for any costs associated with retesting and additional testing.

3.1 MOCK-UP TEST REQUIREMENTS

a. Pre-construction Laboratory Mock-up Shop Drawings: The General Contractor shall submit drawings of the laboratory mock-up with actual dimensions and thicknesses of component parts. The mock-up detail shop drawings must include all details with the functional performance layers (air, moisture, thermal) indicated continuously.
b. The mock-up shall be constructed, tested, and accepted prior to commencement of installation of building envelope systems, assemblies, and components. The mock-up shall include a junction with the roofing membrane, a building corner condition, and project specific base of wall condition. The mock-up shall be 2-1/2 stories tall and shall employ no less than 1000 square feet and include all major envelope components including opaque walls, fenestration assemblies, and a section of roof membrane. For certain building components that are not included in the laboratory mock-up, separate in-situ mock-ups that are the first installed on the building to remain are acceptable.
c. The water leakage requirements are as follows:

1. Water is contained and drained to the exterior
2. There is no wetting of an interior surface that is visible to the building occupants

3. There is no wetting, staining, or other damage or potential damage to completed building equipment, materials, or finishes

d. The coordination and completion of the mock-up construction should be completed by the General Contractor. The General Contractor shall permit inspections of the mock-up to the Building Envelope Commissioning Agent (BECA) and any member of the Building Envelope Commissioning Team throughout construction and testing as required.

e. The Preconstruction Laboratory Mockup Program: Test preconstruction laboratory mockups according to requirements in "Performance Requirements" Article. Perform the following tests in the following sequence:
   1. Remove and replace glass unit as per the approved re-glazing procedures.
   1. Preload wall to remove slack at 50% of positive pressure design load.
   2. Static Air Infiltration/Exfiltration; ASTM E 283: Air infiltration/exfiltration during test shall not exceed limits specified.
   3. Static Water Penetration Test; ASTM E 331: There shall be no infiltration of water to the interior face of the assembly during and/or at conclusion of test.
   4. Dynamic Pressure Water Penetration Test; AAMA 501.1: Perform testing in accordance with AAMA 501.1-05.
   5. Static Structural Performance Test; ASTM E330 Method B.
   6. Thermal Cycling and Condensation Resistance: Test specimen will be subject to three (3) temperature cycles with each cycle consisting of the following exterior conditions:
      a. Hot conditions: 180 deg. F + or – 1 deg. F wall surface temperature for 60 minutes.
      b. Cold conditions: -20 deg. F + or – 1 deg. F wall surface temperature for 60 minutes.
      c. The last cold cycle shall be maintained at 0 deg. F (to be reconciled with exterior cold design temperature) for six (6) hours. No interior surface temperature are allowed to drop below the design dewpoint (to be determined by project mechanical engineer). The thermocouple locations to be identified by the glazing contractor and verified/reviewed by the A/E and BECA.
   6. Repeat Test Sequence: static air, static water, dynamic water above.

f. The contractor shall perform all repairs as necessary to successfully complete the testing identified above prior to proceeding to the testing of completed mock-ups.

g. In the event of water leakage through the test sample either during pre-testing or final testing; additional isolation testing shall be conducted to best determine the location of the water infiltration as required.

h. Where testing indicates that performance requirements are not met, the contractor shall repair or replace the failed section and a retest conducted. Any repairs should be conducted with inspection and documentation by the BECA. Retesting shall be conducted by the

BETA. All costs associated with the repair and retesting shall be the responsibility of the contractor.

4.1 FIELD TEST REQUIREMENTS

A. The GC is responsible for providing all site conditions required for conducting field testing. These items include source of power, water (water to be provided at required rate of 5 gal/hr/sf), and access including any lifts, ladders, scaffolding, etc. Water and power must be within 50 ft. of the test specimen.

B. All field functional performance tests shall be conducted to project performance requirements as set forth in the Construction Documents.

C. The water leakage requirements are as follows:

1. Water is contained and drained to the exterior
2. There is no wetting of a surface that is visible to the building occupants
3. There is no wetting or staining or other damage to completed building equipment, materials, or finishes

D. Where testing indicates that performance requirements are not met, the contractor shall repair or replace the failed section and a re-test conducted. Any repairs should be conducted with inspection by the BECA. Retesting shall be conducted by the BETA. All costs associated with the repair and retesting shall be the responsibility of the contractor.

E. Field functional performance testing should focus on interfaces and transitions of building envelope systems, materials, and assemblies. The following functional performance shall be performed during the construction phase:

1. Static Water Penetration Test; ASTM E 1105: Testing shall be performed at 20 locations (test areas a minimum of 100 sq. ft.) as deemed critical and representative by the project team. Field water penetration testing shall be conducted at 15 psf air pressure differential. Testing shall focus on assembly interfaces and transitions. Dynamic pressure water penetration testing may be performed in lieu of static pressure water testing as deemed appropriate by the CT.
2. Air Barrier Adhesion Testing; ASTM D 4541-09: Measured air barrier adhesion strength shall not be less than 16 lbf/sq. in. Testing performed at a minimum of 8 randomly selected areas.
3. Static Air Infiltration/Exfiltration; ASTM E 783: Air infiltration/exfiltration during test shall not exceed limits specified. Testing shall be conducted at a minimum of three (3) locations on each type of fenestration assembly and

adjacent air barrier (including a minimum of 100 sf of opaque wall air barrier).

4. Sealant Adhesion Testing; ASTM C 1193: Sealant pull testing performed at periodic intervals during construction at each type of sealant joint at different substrates.
5. Horizontal Waterproofing Flood Testing; ASTM D 5957: Flood testing with water covering all of waterproofing membrane at all concealed horizontal waterproofing/roof systems above occupied space. Minimum water depth of 2 in. of water for 48 hours. Flood testing at all other roof systems at drain locations only, minimum water depth of 2 in. for 24 hours.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 11 73 00
CEILING MOUNTED PATIENT LIFT SYSTEM

PART 1 - PARGENERAL

1.1 DESCRIPTION

A. Ceiling Mounted Patient Lift Systems for the transfer of physically challenged patients are specified in this section.

1.2 RELATED WORK

A. Refer to Part 2

1.3 QUALITY ASSURANCE

A. Certification for compliance is required for Ceiling Mounted Patient Lift Systems. Certifications shall be provided by an independent third party who will conduct testing to ensure that the ceiling lift and charging system are safe and in compliance with ISO 10535 & UL 60601-1

1.4 SUBMITTALS

SD-01 Preconstruction Submittals

SD-04 Samples

Model Unit; G

A. Certificates of Compliance

B. Manufacturer's Literature and Data:
1. Lifting Capacity
2. Lifting Speed
3. Horizontal Displacement Speeds
4. Horizontal Axis Motor
5. Vertical Axis Motor
6. Emergency Brake
7. Emergency Lowering Device
8. Emergency Stopping Device
9. Electronic Soft-Start and Soft-Stop Motor Control
10. Current Limiter for Circuit Protection
11. Low Battery Disconnect System
12. Strap Length
13. All equipment anchors and supports. Submittals shall include weights, dimensions, center of gravity, standard connections, manufacturer's recommendations and behavior problems (e.g., vibration, thermal expansion,) associated with equipment or piping so that the proposed installation can be properly reviewed.

C. Individual Room layouts showing location of lift system installation shall be approved before proceeding with installation of lifts.

1.5 APPLICABLE PUBLICATIONS

A. The publications listed below form a part of this specification to the extent referenced. The publications are listed in the text by the basic designation only.

B. International Organization for Standardization (IOS):

10535-06 Hoist for the Transfer of Disabled Persons-Requirements and Test Methods

C. Underwriters Laboratories (UL):

60601-1	Medical Electrical Equipment: General Requirements for Safety
94-1996	UL Standards for Safety Test for Flammability of Plastic Materials for Parts in Devices and Appliances-Fifth Edition

D. International Electromagnetic Commission (IEC):

CISPR 11	Industrial Scientific and Medical (ISM) Radio Frequency Equipment – Electromagnetic Disturbance Characteristics-Limits and Methods of Measurement-Amendment 2
801-2	Electromagnetic Compatibility for Industrial-Process Measurement and Control Equipment-Part 2: Electromagnetic Discharge Requirements

PART 2 - PRODUCTS

2.1 CEILING TRACK SYSTEM

A. The Ceiling Track shall be made from high strength extruded aluminum T66081-T5 at a thickness of 3/16" (4.8mm). Provide anchor supports at a minimum 3 per linear foot at ceiling substrate. The ceiling track shall be finished with baked enamel paint.

2.2 LIFT UNIT

A. The Lift Unit shall be constructed of a steel frame system (2205lbs / 1000kg tested) driven by a gear reduced high torque motor

B. The Lift system shall have the following features.
1. Lifting capacity: 550 lbs (250 kg).
2. Electronic soft-start and soft-stop motor control
3. Emergency lowering device
4. Emergency stopping device
5. Rotating connector to allow 90 degrees of turning
6. Current limiter for circuit protection in case of overload
7. Safety device that stops the motor to lift when batteries are low
8. Lifting speed: 5 cm/s (1.97in/s)
9. Horizontal displacement speed: 5.9in/s (150mm/s)
10. Horizontal axis motor: 24VDC at 62 watts and vertical axis motor at 110 watts
11. Emergency brake (in case of mechanical failure)
12. Strap length up to 90in (2.3m) tested for 2998lbs (1360kg)
13. Cab: VO plastic–fire retardant, UL 94. Slim line style to maximize available lifting height.
14. Wireless remote control

C. Bariatric Lift Unit shall be comprised of two lift units described above, fixed together by a connector rail and able to be operated independently.

2.3 MOTORS

A. All motors shall be able to do more than 10,000 cycles in compliance with IEC CISPR 11.

B. Vertical Movement-DC Motor
1. Type: Class A, fully enclosed, permanent magnet.
2. Rating: 24Vdc, 1.1A, 110W, 4000RPM, 0.3N-m.
3. Mounting: Secured to chassis.

C. Horizontal Movement-DC Motor
1. Type: Fully enclosed, permanent magnet, integral reducer.
2. Rating: 24Vdc, 1.8A, 62W, 260RPM, 1.0N-m.
3. Mounting: Secured to chassis.

2.4 BATTERIES

A. The life cycle (number of charging cycles) for batteries shall be in compliance with IEC 801-2.

B. Provide rechargeable batteries with up to 120 transfers with a load of 200lbs (74kg) and up to 70 transfers with its maximum load of 550lbs (250kg).

2.5 CHARGER

A. Charger Input: 100-240 Vac, 50/60 Hz

B. Charger Output: 27 Vdc, 1 A max

C. Supplemental to the charger provide a clip on charging station with indicator lights.

2.6 STRAPS AND SLING

A. The straps shall be made of threaded nylon. The straps shall ensure the patient's safety by preventing the patient from falling out of the sling.

B. The sling shall be made from a polyester/nylon net material that is pliable, breathable and easy to use. The sling shall cradle the body of the patient.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install ceiling mounted patient lift system as per manufacturer's instruction and under the supervision of manufacturer's qualified representative and as shown on drawings.

B. If the distance in between the suspended ceiling and anchors is more than 18" consult with manufacturer to determine if lateral braces will be required.

3.2 INSTRUCTION AND PERSONNEL TRAINING

A. Training shall be provided for the required personnel to educate them on proper operation and maintenance for the lift system equipment.

3.3 TEST

A. Conduct performance test, in the presence of the Resident Engineer and a manufacturer's field representative, to show that the patient lift system equipment and control devices operate properly and in accordance with design and specification requirements.

END OF SECTION

SECTION 14 21 00
ELECTRIC TRACTION ELEVATOR

PART 1 GENERAL

Machine Room-less Elevators are not to be used.

1.1 DESCRIPTION

A. This section specifies the engineering, furnishing and installation of complete and ready for operation electric traction elevator systems described herein and as indicated on the contract drawings.

B. Items listed in the singular apply to each and every elevator in this specification except where noted.

C. Passenger Elevators No. P 1, P 2, P 3, P 4, shall be overhead gearless traction type; with Variable Voltage Variable Frequency (VVVF) microprocessor based control system with regenerative drive group selective collective automatic group automatic operation and power operated single-speed center opening car and hoistway doors. Elevators shall have Class "A" loading.

D. Patient Service Elevators No. S 5, S 6, shall be overhead gearless traction type; with Variable Voltage, Variable Frequency (VVVF) microprocessor based control system with regenerative drive; duplex selective collective automatic operation and power operated two-speed car and hoistway doors. Elevators shall have Class "C1" loading.

E. Materials Handling Elevators No. MH 7, MH 8, shall be overhead gearless traction type; with Variable Voltage, Variable Frequency (VVVF) microprocessor based control system with regenerative drive; duplex selective collective automatic operation and power operated two-speed car and hoistway doors. Elevators shall have Class "C1" loading. One elevator shall be capable of transporting the "Etheon" automatic Pharmacy robot as well as manual transport of materials handling carts. The second materials handling elevator shall have access to the roof penthouse.

1.2 RELATED WORK

A. Section 01 33 23 SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION (FAR 52.236-21) and, SPECIAL NOTES (VAAR 852.236-91), in GENERAL CONDITIONS.
B. Section 07 84 00, FIRESTOPPING: Sealing around penetrations to maintain the integrity of fire-rated construction.
C. SECTION 09 06 00, SCHEDULE FOR FINISHES: As a master format for construction projects, to identify interior and exterior material finishes for type, texture, patterns, color and placement.
D. Section 13 05 41, SEISMIC RESTRAINT REQUIREMENTS FOR NON-STRUCTURAL COMPONENTS: Requirements for seismic restraint of non-structural components.
E. Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS: General electrical requirements that are common to more than one section.
F. Section 26 05 21, LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES (600 VOLTS AND BELOW): Low Voltage power and lighting wiring.
G. Section 26 05 26, GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS: Requirements for personnel safety and to provide a low impedance path for possible ground fault currents.
H. Section 26 05 33, RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS: Conduits for cables and wiring.
I. Section 26 05 71, ELECTRICAL SYSTEM PROTECTIVE DEVICE STUDY: Requirements for installing the over-current protective devices to ensure proper equipment and personnel protection.
J. Section 26 22 00, LOW-VOLTAGE TRANSFORMERS: Low voltage transformers.
K. Section 26 24 16, PANELBOARDS: Low voltage panel-boards.
L. Section 26 43 13, TRANSIENT-VOLTAGE SURGE SUPPRESSION: Surge suppressors installed in panel-boards.
M. Section 26 51 00, INTERIOR LIGHTING: Fixture and ballast type for interior lighting.
N. VA Barrier Free Design Handbook (H-18-13)

1.3 QUALIFICATIONS

A. Approval by the Contracting Officer is required for products and services of proposed manufacturers, suppliers and installers and shall be contingent upon submission by Contractor of certificates stating the following:

1. Elevator contractor is currently and regularly engaged in the installation of elevator equipment as one of his principal products.
2. Elevator contractor shall have three years of successful experience, trained supervisory personnel, and facilities to install elevator equipment specified herein.

3. The installers shall be Certified Elevator Mechanics with technical qualifications of at least five years of successful experience and Apprentices actively pursuing certified mechanic status. Certificates shall be submitted for all workers employed in this capacity.
4. Elevator contractor shall submit a list of two or more prior hospital installations where all the elevator equipment he proposes to furnish for this project functioned satisfactorily to serve varying hospital traffic and material handling demands. Provide a list of hospitals that have the equipment in operation for two years preceding the date of this specification. Provide the names and addresses of the Medical Centers and the names and telephone numbers of the Medical Center Administrators.

B. Approval of Elevator Contractor's equipment will be contingent upon their identifying an elevator maintenance service provider that shall render services within one hour of receipt of notification, together with certification that the quantity and quality of replacement parts stock is sufficient to warranty continued operation of the elevator installation.
C. Approval will not be given to elevator contractors and manufacturers who have established on prior projects, either government, municipal, or commercial, a record for unsatisfactory elevator installations, have failed to complete awarded contracts within the contract period, and do not have the requisite record of satisfactorily performing elevator installations of similar type and magnitude.
D. All electric traction elevators shall be the product of the same manufacturer.
E. The Contractor shall provide and install only those types of safety devices that have been subjected to tests witnessed and certified by an

independent professional testing laboratory that is not a subsidiary of the firm that manufactures supplies or installs the equipment.

F. Welding at the project site shall be made by welders and welding operators who have previously qualified by test as prescribed in American Welding Society Publications AWS Dl.1 to perform the type of work required. Certificates shall be submitted for all workers employed in this capacity. A welding or hot work permit is required for each day and shall be obtained from the COTR of safety department. Request permit one day in advance.

G. Electrical work shall be performed by Licensed Electricians as requirements by NEC. Certificates shall be submitted for all workers employed in this capacity.

1.4 APPLICABLE PUBLICATIONS

A. The publications listed below form a part of this specification. Elevator installation shall meet the requirements of the latest editions published and adopted by the United States Department of Veterans Affairs on the date contract is signed.

B. Federal Specifications (Fed. Spec.):

J-C-30B	Cable and Wire, Electrical (Power, Fixed Installation)
W-C-596F	Connector, Plug, Electrical; Connector, Receptacle, Electrical
W-F-406E	Fittings for Cable, Power, Electrical and Conduit, Metal, Flexible
HH-I-558C	Insulation, Blankets, Thermal (Mineral Fiber, Industrial Type)
W-F-408E	Fittings for Conduit, Metal, Rigid (Thick- Wall and Thin-wall (EMT) Type)
RR-W-410	Wire Rope and Strand
TT-E-489J	Enamel, Alkyd, Gloss, Low VOC Content
QQ-S-766	Steel, Stainless and Heat Resisting, Alloys, Plate, Sheet and Strip

C. International Building Code (IBC)

D. American Society of Mechanical Engineers (ASME):

A17.1.....Safety Code for Elevators and Escalators

A17.2.....Inspectors Manual for Electric Elevators and Escalators

E. National Fire Protection Association:

NFPA 13.....Standard for the Installation of Sprinkler Systems

NFPA 70.....National Electrical Code (NEC)

NFPA 72.....National Fire Alarm and Signaling Code

NFPA 101.....Life Safety Code

NFPA 252.....Fire Test of Door Assemblies

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

A1008/A1008M-09 .....Steel, Sheet, Cold Rolled, Carbon, Structural, High-Strength Low-Alloy and High Strength Low-Alloy with Improved Farability

E1042-02 .....Acoustically Absorptive Materials Applied by Trowel or Spray

G. Society of Automotive Engineers, Inc. (SAE)

J517-91.....Hydraulic Hose, Standard

H. Gauges:

For Sheet and Plate: U.S. Standard (USS)

For Wire: American Wire Gauge (AWG)

I. American Welding Society (AWS):

D1.1 .....Structured Welding Code Steel

J. National Electrical Manufacturers Association (NEMA):

LD-3 .....High-Pressure Decorative Laminates

K. Underwriter's Laboratories (UL):

486A .....Safety Wire Connectors for Copper Conductors

797 .....Safety Electrical Metallic Tubing

L. Institute of Electrical and Electronic Engineers (IEEE)

M. Regulatory Standards:

Uniform Federal Accessibility Standards

Americans with Disabilities Act

1.5 SUBMITTALS

A. Submit in accordance with Specification Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, and SAMPLES.

B. Before execution of work, furnish information to evidence full compliance with contract requirements for proposed items. Such information shall include, as required: Manufacturer's Name, Trade

Names, Model or Catalog Number, Nameplate Data (size, capacity, and rating) and corresponding specification reference (Federal or project specification number and paragraph). All submitted drawings and related elevator material shall be forwarded to the Contracting Officer.

C. Shop Drawings:
   1. Complete scaled and dimensioned layout in plan and section view showing the arrangement of equipment and all details of each and every elevator unit specified including:
      a. Hoisting machines, controllers, power conversion devices, governors, and all other components located in machine room.
      b. Car, counterweight, sheaves, supporting beams, guide rails, brackets, buffers, size of car platform, car frame members, and other components located in hoistway.
      c. Rail bracket spacing and maximum vertical forces on guide rails in accordance with ASME A17.1 Section 2.23 and Section 8.4.8 for Seismic Risk Zone 2 or greater.
      d. Reactions at points of supports and buffer impact loads.
      e. Weights of principal parts.
      f. Top and bottom clearances and over travel of car and counterweight.
      g. Location of shunt trip circuit breaker, switchboard panel, light switch, and feeder extension points in the machine room.
   2. Drawings of hoistway entrances and doors showing details of construction and method of fastening to the structural members of the building.
      a. If drywall construction is used to enclose hoistway, submit details of interface fastenings between entrance frames and drywall.
      b. Sill details including sill support.

D. Samples:
   1. One each of stainless steel, 75 mm x 125 mm (3 in. x 5 in.).
   2. One each of baked enamel, 75 mm x 125 mm (3 in. x 5 in.).
   3. One each of color vinyl floor tile.
   4. One each of protection pads, 75 mm x 125 mm (3 in. x 5 in.) if used.
   5. One each car and hoistway Braille plate sample.
   6. One each car and hall button sample.

7. One each car and hall lantern/position indicator sample.
8. One each wall and ceiling material finish sample.
9. One each car lighting sample.
10. No other samples of materials specified shall be submitted unless specifically requested after submission of manufacturer's name. If additional samples are furnished pursuant to request, adjustment in contract price and time will be made as provided in Section 00 72 00, GENERAL CONDITIONS.

E. Name of manufacturer, type or style designation, and applicable data of the following equipment shall be shown on the elevator layouts:
1. Hoisting Machine.
2. Hoisting Machine Motor, HP and RPM ratings, Voltage, Starting and Full Load Ampere, and Number of Phases.
3. Controller
4. Starters and Overload Current Protection Devices.
5. Car Safety Device; maximum and minimum rated loads and rated speeds.
6. Governor
7. Electric Door Operator; HP and RPM ratings, Voltage and Ampere rating of motor.
8. Hoistway Door Interlocks.
9. Car and Counterweight Buffers; maximum and minimum rated loads, maximum rated striking speed and stroke.
10. Hoist and Compensation Ropes; ultimate breaking strength, allowable working load, and actual working load.
11. Cab Ventilation Unit; HP rating and CFM rating.

F. Complete construction drawings of elevator car enclosure, showing dimensioned details of construction, fastenings to platform, car lighting, ventilation, ceiling framing, top exits, and location of car equipment.

G. Complete dimensioned detail of vibration isolating foundations for traction hoisting machines.

H. Dimensioned drawings showing details of:
1. All signal and operating fixtures.
2. Car and counterweight roller guides.
3. Hoistway door tracks, hangers, and sills.
4. Door operator, infrared curtain units.

I. Drawings showing details of controllers and supervisory panels.

J. Furnish certificates as required under: Paragraph "QUALIFICATIONS".

1.6 WIRING DIAGRAMS

A. Provide three complete sets of field wiring and straight line wiring diagrams showing all electrical circuits in the hoistway, machine room and fixtures. Install one set coated with an approved plastic sealer and mounted in the elevator machine room as directed by the Resident Engineer.

B. In the event field modifications are necessary during installation, diagrams shall be revised to include all corrections made prior to and during the final inspection. Corrected diagrams shall be delivered to the Resident Engineer within thirty (30) days of final acceptance.

C. Provide the following information relating to the specific type of microprocessor controls installed:

1. Owner's information manual, containing job specific data on major components, maintenance, and adjustment.
2. System logic description.
3. Complete wiring diagrams needed for field troubleshooting, adjustment, repair and replacement of components. Diagrams shall be base diagrams, containing all changes and additions made to the equipment during the design and construction period.
4. Changes made during the warranty period shall be noted on the drawings in adequate time to have the finalized drawings reproduced for mounting in the machine room no later than six months prior to the expiration of the warranty period.

1.7 ADDITIONAL EQUIPMENT

A. Additional equipment required to operate the specified equipment manufactured and supplied for this installation shall be furnished and installed by the contractor. The cost of the equipment shall be included in the base bid.

B. Equipment not required by specification, which would improve the operation, may be installed in conjunction with the specified equipment by the contractor at his option at no additional cost to the

Government, provided prior approval is obtained from the Contracting Officer's Technical Representative.

1.8 TOOL CABINET

A. Provide a metal parts/tool cabinet, having two shelves and hinged doors. Cabinet size shall be 1220 mm (48 in.) high, 762 mm (30 in.) wide, and 457 mm (18 in.) deep.

1.9 PERFORMANCE STANDARDS

A. The elevators shall be capable of meeting the highest standards of the industry and specifically the following:
   1. Contract speed is high speed in either direction of travel with rated capacity load in the elevator. Speed variation under all load conditions, regardless of direction of travel, shall not vary more than three (3) percent.
   2. The controlled rate of change of acceleration and retardation of the car shall not exceed 0.1G per second and the maximum acceleration and retardation shall not exceed 0.2G per second.
   3. Starting, stopping, and leveling shall be smooth and comfortable without appreciable steps of acceleration and deceleration.
B. The door operator shall open the car door and hoistway door simultaneously at 2.5-feet per second and close at 1-foot per second.
C. Elevator control system shall be capable of starting the car without noticeable "roll-back" of hoisting machine sheave, regardless of load condition in car, location of car, or direction of travel.
D. Floor level stopping accuracy shall be within 3 mm (1/8 in.) above or below the floor, regardless of load condition.
E. Noise and Vibration Isolation: All elevator equipment including their supports and fastenings to the building, shall be mechanically and electrically isolated from the building structure to minimize objectionable noise and vibration transmission to car, building structure, or adjacent occupied areas of building.
F. Sound Isolation: Noise level relating to elevator equipment operation in machine room shall not exceed 80 dBA. All dBA readings shall be taken three (3) feet off the floor and three (3) feet from equipment.

G. Airborne Noise: Measured noise level of elevator equipment during operation shall not exceed 50 dBA in elevator lobbies and 60 dBA inside car under any condition including door operation and car ventilation exhaust blower on its highest speed.

1.10 WARRANTY

A. Submit all labor and materials furnished in connection with elevator system and installation to terms of "Warranty of Construction" articles of FAR clause 52.246-21. The one year Warranty shall commence after final inspection, completion of performance test, and upon full acceptance of the installation and shall concur with the guarantee period of service.

B. During warranty period if a device is not functioning properly or in accordance with specification requirements, or if in the opinion of the Contracting Officer's Technical Representative, excessive maintenance and attention must be employed to keep device operational, device shall be removed and a new device meeting all requirements shall be installed as part of work until satisfactory operation of installation is obtained. Period of warranty shall start anew for such parts from date of completion of each new installation performed, in accordance with foregoing requirements.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Where stainless steel is specified, it shall be corrosion resisting steel complying with Federal Specification QQ-S-766, Class 302 or 304, Condition A with Number 4 finish on exposed surfaces. Stainless steel shall have the grain of belting in the direction of the longest dimension and surfaces shall be smooth and without waves. During installation all stainless steel surfaces shall be protected with suitable material.

B. Where cold rolled steel is specified, it shall be low-carbon steel rolled to stretcher leveled standard flatness, complying with ASTM A109.

2.2 MANUFACTURED PRODUCTS

A. Materials, devices, and equipment furnished shall be of current production by manufacturers regularly engaged in the manufacture of such items. Items not meeting this requirement, but meet technical specifications which can be established through reliable test reports or physical examination of representative samples, will be considered.

B. When two or more devices of the same class of materials or equipment are required, these units shall be products of one manufacturer.

C. Manufacturers of equipment assemblies which include components made by others shall assume complete responsibility for the final assembled unit.

   1. Individual components of assembled units shall be products of the same manufacturers.
   2. Parts which are alike shall be the product of a single manufacturer.
   3. Components shall be compatible with each other and with the total assembly for the intended service.

D. Motor nameplates shall state manufacturers' name, rated horsepower, speed, volts, starting and full load amperes, and other characteristics required by NEMA Standards and shall be securely attached to the item of equipment in a conspicuous location.

E. The elevator equipment, including controllers, door operators, and supervisory system shall be the product of manufacturers of established reputation, provided such items are capably engineered and produced under coordinated specifications to ensure compatibility with the total operating system. Mixing of manufactures related to a single system or group of components shall be identified in the submittals.

F. Where key operated switches are furnished in conjunction with any component of this elevator installation, furnish four (4) keys for each individual switch or lock. Provide different key tumblers for different switch and lock functions. Each and every key shall have a tag bearing a stamped or etched legend identifying its purpose. Barrel key switches are not acceptable, except where required by code.

G. If the elevator equipment to be installed is not known to the Resident Engineer, the Contractor shall submit drawings in triplicate for approval to the Resident Engineer, Contracting Officer, and VA CFM Elevator Engineer showing all details and demonstrate that the

equipment to be installed is in strict accordance with the specifications.

2.3 CAPACITY, SIZE, SPEED, AND TRAVEL

A. Each and every elevator shall have the capacity to lift and lower the live load, including the weight of the car and cables, at the speed specified in the following schedule:

ELEVATOR SCHEDULE	
Elevator Number	Passenger Elevators No. P1,P2,P3 & P4
Overall Platform Size	
Rated Load –lb	4000
Contract Speed - fpm	350
Total Travel Distance -	58′-9″
Number of Stops	6
Number of Openings	6
Type of Roping	Gearless Traction
Entrance Type and Size	4′-0″ Center

ELEVATOR SCHEDULE	
Elevator Number	Passenger Elevators No. S5 & S6
Overall Platform Size	
Rated Load –lb	9000
Contract Speed - fpm	200
Total Travel Distance -	72′-7″
Number of Stops	6
Number of Openings	6
Type of Roping	Electric Traction
Entrance Type and Size	5′-0″ Side Slide

ELEVATOR SCHEDULE

ELEVATOR SCHEDULE	
Elevator Number	Passenger Elevators No. MH7 &MH8
Overall Platform Size	
Rated Load –lb	5000
Contract Speed - fpm	350
Total Travel Distance -	72′-7″
Number of Stops	6
Number of Openings	6
Type of Roping	Gearless Electric Traction
Entrance Type and Size	4′-6″ Side Slide

2.4 POWER SUPPLY

A. For power supply in each machine room, see Specification 26 05 21, Electrical specifications, and Electrical drawings.

B. It shall be the Electrical contractor's responsibility to supply the labor and materials for the installation of the following:

l. Feeders from the power source indicated on the drawings to each elevator controller.

2. Shunt Trip Circuit Breaker for each controller shall be located inside machine room at the strike side of the machine room door and lockable in the "Off" position.

3. Provide Surge Suppressors to protect the elevator equipment.

C. Power for auxiliary operation of elevator as specified shall be available from auxiliary power generator, including wiring connection to the elevator control system.

2.5 CONDUIT AND WIREWAY

A. Unless otherwise specified or approved, install electrical conductors, except traveling cable connections to the car, in rigid zinc-coated steel or aluminum conduit, electrical metallic tubing or metal wireways. Rigid conduit smaller than 3/4 inch or electrical metallic tubing smaller than 1/2 inch electrical trade size shall not be used. All raceways completely embedded in concrete slabs, walls, or floor

fill shall be rigid steel conduit. Wireway (duct) shall be installed in the hoistway and to the controller and between similar apparatus in the elevator machine room. Fully protect self-supporting connections, where approved, from abrasion or other mechanical injury. Flexible metal conduit not less than 3/8 inch electrical trade size may be used, not exceeding 18 inches in length unsupported, for short connections between risers and limit switches, interlocks, and for other applications permitted by NEC.

B. All conduit terminating in steel cabinets, junction boxes, wireways, switch boxes, outlet boxes and similar locations shall have approved insulation bushings. Install a steel lock nut under the bushings if they are constructed completely of insulating materials. Protect the conductors at ends of conduits not terminating in steel cabinets or boxes by terminal fittings having an insulated opening for the conductors.

C. Rigid conduit and EMT fittings using set screws or indentations as a means of attachment shall not be used. All fittings shall be steel or malleable iron.

D. Connect motor or other items subject to movement, vibration or removal to the conduit or EMT systems with flexible, steel conduits.

2.6 CONDUCTORS

A. Unless otherwise specified, conductors, excluding the traveling cables, shall be stranded or solid coated annealed copper in accordance with Federal Specification J-C-30B for Type RHW or THW. Where 16 and 18 AWG are permitted by NEC, single conductors or multiple conductor cables in accordance with Federal Specification J-C-580 for Type TF may be used provided the insulation of single conductor cable and outer jacket of multiple conductor cable is flame retardant and moisture resistant. Multiple conductor cable shall have color or number coding for each conductor. Conductors for control boards shall be in accordance with NEC. Joints or splices are not permitted in wiring except at outlets. Tap connectors may be used in wireways provided they meet all UL requirements.

B. Provide all conduit and wiring between machine room, hoistway and fixtures.

C. All wiring must test free from short circuits or ground faults. Insulation resistance between individual external conductors and between conductors and ground shall be a minimum of one megohm.
D. Where size of conductor is not given, voltage and amperes shall not exceed limits set by NEC.
E. Provide equipment grounding. Ground the conduits, supports, controller enclosure, motor, platform and car frame, and all other non-current conducting metal enclosures for electrical equipment in accordance with NEC. The ground wires shall be copper, green insulated and sized as required by NEC. Bond the grounding wires to all junction boxes, cabinets, and wire raceways.
F. Terminal connections for all conductors used for external wiring between various items of elevator equipment shall be solderless pressure wire connectors in accordance with Federal Specification W-S-610. The Elevator Contractor may, at his option, make these terminal connections on 10 gauge or smaller conductors with approved terminal eyelets set on the conductor with a special setting tool, or with an approved pressure type terminal block. Terminal blocks using pierce-through serrated washers are not acceptable.

2.7 TRAVELING CABLES

A. All conductors to the car shall consist of flexible traveling cables conforming to the requirements of NEC. Traveling cables shall run from the junction box on the car directly to the controller. Junction boxes on the car shall be equipped with terminal blocks. Terminal blocks having pressure wire connectors of the clamp type that meet UL 486A requirements for stranded wire may be used in lieu of terminal eyelet connections. Terminal blocks shall have permanent indelible identifying numbers for each connection. Cables shall be securely anchored to avoid strain on individual terminal connections. Flame and moisture resistant outer covering must remain intact between junction boxes. Abrupt bending, twisting and distortion of the cables shall not be permitted.
B. Provide spare conductors equal to 10 percent of the total number of conductors furnished, but not less than 5 spare conductors in each traveling cable.

C. Provide shielded wires for the auto dial telephone system within the traveling cable. Add 5 pair shielded wires for card reader, 2 RG-6/U coaxial CCTV cables, and 2 pair 14 gauge wires for CCTV power as needed.
D. If traveling cables come into contact with the hoistway or elevator due to sway or change in position, provide shields or pads to the elevator and hoistway to prevent damage to the traveling cables.
E. Hardware cloth wide may be installed from the hoistway suspension point downward to the elevator pit to prevent traveling cables from rubbing or chafing. Hardware cloth shall be securely fastened and tensioned to prevent buckling. Hardware cloth is not required when traveling cable is hung against a flat wall.

2.8 CONTROLLER and SUPERVISORY PANEL

A. UL/CSA Labeled Controller: Mount all assemblies, power supplies, chassis switches, and relays on a self-supporting steel frame. Completely enclose the equipment and provide a mean to control the temperature. Solid state components shall be designed to operate between 32 to 104 degrees Fahrenheit, humidity non-condensing up to 85 percent.
B. All controller switches and relays shall have contacts of design and material to insure maximum conductivity, long life and reliable operation without overheating or excessive wear, and shall provide a wiping action to prevent sticking due to fusion. Switches carrying highly inductive currents shall be provided with arc shields or suppressors.
C. Where time delay relays are used in the circuits, they shall be of acceptable design, adjustable, reliable, and consistent such as condenser timing or electronic timing circuits.
D. Properly identify each device on all panels by name, letter, or standard symbol which shall be neatly stencil painted or decaled in an indelible and legible manner. Identification markings shall be coordinated with identical markings used on wiring diagrams. The ampere rating shall be marked adjacent to all fuse holders. All spare conductors to controller and supervisory panel shall be neatly formed, laced, and identified.

2.9 MICROPROCESSOR CONTROL SYSTEM

A. Provide a microprocessor based system with absolute position/speed feedback encoded tape to control the hoisting machine and signal functions in accordance with these specifications. Complete details of the components and printed circuit boards, together with a complete operational description, shall be submitted for approval.
   1. All controllers shall be non-proprietary.
   2. Proprietary tools shall not be necessary for adjusting, maintenance, repair, and testing of equipment.
   3. Controller manufacturer shall provide factory training, engineering and technical support, including all manuals and wiring diagrams to the VA Medical Center's designated Elevator Maintenance Service Provider.
   4. Replacement parts shall be shipped overnight within 48 hours of an order being received.

B. All controller assemblies shall provide smooth, step-less acceleration and deceleration of the elevator, automatically and irrespective of the load in the car. All control equipment shall be enclosed in metal cabinets with lockable, hinged door(s) and shall be provided with a means of ventilation. All non-conducting metal parts in the machine room shall be grounded in accordance with NEC. Cabinet shall be securely attached to the building structure.

C. Circuit boards for the control of each and every elevator system; dispatching, signals, door operation and special operation shall be installed in a NEMA Type 1 General Purpose Enclosure. Circuit boards shall be moisture resistant, non-corrosive, non-conductive, fabricated of non-combustible material and adequate thickness to support the components mounted thereon. Mounting racks shall be spaced to prevent accidental contact between individual circuit boards and modules.

D. Modules shall be the type that plug into pre-wired mounting racks. Field wiring or alteration shall not be necessary in order to replace defective modules.

E. Each device, module and fuse (with voltage and ampere rating) shall be identified by name, letter or standard symbol in an approved indelible and legible manner on the device or panel. Coordinate identification markings with identical markings on wiring diagrams.

F. The electrical connections between the printed circuit boards (modules) and the circuit connectors incorporated in the mounting racks shall be made through individual tabs which shall be an integral part of each module. The tabs shall be nickel-gold plated or other approved metal of equal electrical characteristics. Modules shall be keyed or notched to prevent insertion of the modules in the inverted position.

G. Light emitting diodes (LED) shall be for visual monitoring of individual modules.

H. Components shall have interlocking circuits to assure fail-safe operation and to prevent elevator movement should a component malfunction.

I. Method of wire wrapping from point to point with connections on the mounting racks shall be submitted for approval.

J. Field wiring changes required during construction shall be made only to the mounting rack connection points and not to the individual module circuitry or components. If it is necessary to alter individual modules they shall be returned to the factory where design changes shall be made and module design records changed so correct replacement units will be available.

K. All logic symbols and circuitry designations shall be in accordance with ASME and NEC Standards.

L. Solid state components shall be designed to operate within a temperature range of 32 to 104 degrees Fahrenheit, humidity non-condensing up to 85 percent.

M. Wiring connections for operating circuits and for external control circuits shall be brought to terminal blocks mounted in an accessible location within the controller cabinet. Terminal blocks using pierce through serrated washers shall not be used.

2.10 VVVF AC MOTOR CONTROL WITH REGENERATIVE DRIVE

A. Variable Voltage Variable Frequency Motor Control:

1. Elevator control shall be affected by means of a compact solid state motor control unit for each and every elevator with electrical characteristics to suit the power supply. The system shall consist of the necessary three phase, full-wave bridge rectifiers and be equipped with regenerative drive.

2. Solid state motor control unit shall operate with high efficiency and low power consumption, have the capacity to handle peak currents typical of elevator service and contain a balanced, coordinated fault protection system which shall accomplish the following:
   a. Protect the complete power circuit and specifically the power semi-conductors from failure under short circuit (bolted fault) conditions.
   b. Protect against limited faults arising from partial grounds, partial shorts in the motor armature or in the power unit itself.
   c. Protect the drive motor against sustained overloads. A solid state overload circuit shall be used.
   d. Protect motor and power unit against instantaneous peak overload.
   e. Provide semi-conductor transient protection.
   f. Provide phase sequence protection to insure incoming line is phased properly.
   g. Removable printed circuit boards shall be provided for the VVVF control. Design tabs so boards cannot be reversed.

2.11A AUXILIARY POWER OPERATION

A. The control system for Elevators P 1 through P 4, S 5 and S 6 and MH7 and MH8 shall provide for the operation of at least one car per elevator bank on auxiliary power upon failure of the normal power supply.

C. Auxiliary equipment on elevator controllers, and wiring between associated elevator controllers and the remote selector panel as required to permit the elevators to operate as detailed shall be provided by the Elevator Contractor.

D. Upon loss of normal power supply there shall be a delay before transferring to auxiliary power of 10 seconds minimum to 45 seconds maximum, the delay shall be accomplished through an adjustable timing device. Following this adjustable delay the associated elevators shall function as follows:

   1. Selector switch, Automatic position:
      a. Not more than one elevator at a time in each group shall be automatically selected and returned to the main floor, at normal

speed, cycle its car and hoistway doors and shut down, with "Door Open" button remaining operable.

b. As each elevator reaches the designated floor and shuts down, another elevator shall start and return to the designated floor.

c. Elevators that have been manually removed from automatic service and are on independent service, fire service or medical emergency shall receive an automatic return signal. Elevators on inspection service or out of service shall not receive a signal.

d. When an elevator is given a signal to return and it is unable to start its movement to the designated floor within 30 seconds it shall be by-passed. When an elevator is by-passed, another elevator shall start and return.

e. This process shall continue until all elevators have returned to the designated floor and shut down.

f. Any elevator or elevators by-passed on initial return signal shall be signaled again.

g. When all cars in group have returned to designated floor, all elevators in each group shall be designated for automatic operation. Individual cars in each group shall restart at 5 second intervals.

h. If electric traction elevators are keyed on to medical emergency service in the car prior to transfer to auxiliary power operation, medical emergency service shall be retained. A car call registered prior to transfer shall also be retained. This elevator shall be the first automatically selected elevator to operate on auxiliary power operation and complete its selected call demand. The elevator will return to the designated floor after the key switch is reset to normal position.

2. Selector switch, Manual operation:

a. Selector switch shall be mechanically and electrically interlocked to prevent the selection of more than one elevator in that group from operating on auxiliary power.

b. The selector switch shall have positions marked with the number of each elevator controlled. It shall also have a position marked

"Automatic". When the selector switch is set to the automatic position, the medical emergency service car shall operate on auxiliary power operation, or if none, the last car arriving at the designated floor shall operate on auxiliary power operation.

c. Change in selection of elevators shall be by means of the selection switch and shall occur only when the previous selected elevator is stopped at the designated floor.

d. The selector switch shall be locked out of operation when the system is in the normal mode of operation.

e. Locate the selector switch above the hall push button station at the designated level in a NEMA 1B flush type enclosure furnished with a brushed finish stainless steel hinged door and frame. The door shall contain a tumbler type lock furnished with four keys. The enclosure faceplate shall be identified "Auxiliary Power Control" with 13 mm (1/2 in.) engraved letters filled with black paint.

3. The inside of the selector panel shall be brushed finish stainless steel with each device identified with 3 mm (1/8 in.) engraving filled with black paint. The panel shall contain:

a. Selector switch for selecting the elevators shall be toggle or rotary type switch.

b. Pilot lights to indicate normal mode of operation, auxiliary power service available, and which elevator or elevators in each group is connected to auxiliary service.

c. A lamp test circuit consisting of a momentary contact push button to test all pilot lights in the circuit.

d. Provide a permanently mounted, easy to read, instruction plate which shall include operating instructions for auxiliary power service and instructions for lamp test circuits.

E. Prior to the return of normal power an adjustable timed circuit shall be activated that will cause all cars to remain at a floor if already there or stop and remain at the next floor if in flight. Actual transfer of power from auxiliary power to normal building power shall take place after all cars are stopped at a floor with their doors open.

F. Car lighting circuits shall be connected to the auxiliary power panel.

2.11B EMERGENCY RESCUE OPERATION

A. Provide a power source to send the elevator to the nearest landing. After the elevator has leveled at the nearest landing, provide power to open the car and hoistway doors automatically. After a predetermined time the doors shall close. Power shall stay applied to the door open button so the doors can be opened from the inside of the elevator. The elevator shall remain shut down at the landing until normal power is restored. Install a sign on the controller indicating that the power is applied to emergency rescue operator and door operator during loss of normal power.

2.12B DUPLEX SELECTIVE COLLECTIVE AUTOMATIC OPERATION

A. Provide duplex selective collective automatic operation, for passenger service elevators S5 and S6.

B. Operate elevators from push buttons inside the cars and located at each and every floor between elevators. When cars are available, park one car at main floor (home car) and the other car at last call (free car). Respond to car calls and hall calls above main floor using the "free" car. Once a car has started, respond to registered calls in the direction of travel and in the order the floors are reached. Do not reverse the car direction until all car calls have been answered, or until all hall calls ahead of the car and corresponding to the direction of car travel have been answered.

   Slow and stop elevators automatically at floors corresponding to registered calls in the order in which they are approached in each direction of travel. As slowdown is initiated, automatically cancel the hall call and car call. Hold car at arrival floor an adjustable time interval to allow passenger transfer.

   When the "free" car is clearing calls, the "home" car shall respond to the following:

   1. Calls registered on "home" car push buttons.
   2. Up hall calls registered below "free" car.
   3. Up or down calls registered above "free" car while "free" car is traveling down.
   4. Hall calls when "free" car is delayed in its normal operation for a predetermined period.

C. When both cars are clearing calls, stop only one car in response to any registered hall call. Return the first car to clear its calls to the main floor. Should last service required bring both cars to main floor, the first arriving car becomes the "free" car. Illuminate floor push button to indicate call registration. Extinguish light when call is answered.
D. If a landing button is operated while the car and hoistway doors are closing at that floor, the call shall be registered for the next available elevator. Calls registered shall be canceled if closing doors are reopened by means of "DOOR OPEN" button or infrared curtain unit.
E. When an elevator is delayed for a predetermined time interval or shuts down after it receives a start signal, the system shall automatically permit the remaining car in the group to respond to hall calls and to be dispatched in normal manner. When cause of delay is corrected, car shall automatically resume normal operation unless it has been manually removed from the system.
F. Auxiliary Landing Call Operation: In the event of corridor call button circuit failure, elevators are to service each floor in both directions in a predetermined pattern without registration of a call within the elevators. Provide illuminated signal in each the controller to indicate that emergency dispatch operation is in effect. Restoration of the landing call button system shall cause normal operation to resume.
G. Car lights and fan in the elevator shall not shut off when elevator is idle. Arrange circuits so that power to lights and outlets on top and bottom of car shall not be interrupted.
H. Answer lower floor calls with the home car unless the free car is parked at the floor where the call occurs. If no car is parked at main level, answer calls below main floor using the first available car.

2.12C GROUP SELECTIVE COLLECTIVE AUTOMATIC OPERATION

A. Elevators P1 through P4, inclusive, shall have group automatic operation and shall be capable of balancing service and providing continuity of group operation with one or more cars removed from the system.
B. Group supervisory computer control system shall govern the movement of the individual cars in the group in a fully zoned system to provide the

maximum efficiency in serving the VA hospital traffic demands. The system shall electronically calculate and continuously evaluate the varying traffic demands and automatically change the method of dispatching, and send cars to various floors of the hospital as appropriate, to provide an effective response to the landing calls of prevalent traffic. The system shall function to accommodate the anticipated varying hospital traffic demand and be flexible so that it can be modified to accommodate changes in traffic patterns.

1. Arrange the system to maintain movement of cars to satisfy all traffic demands which occur throughout the day. The system shall function on the basis of conditions as they exist at the present time and not on conditions as measured in a preceding time period.
2. Any car, after satisfying all car calls and corridor calls in its direction of travel, shall become available for immediate dispatch to any floor where demand exists regardless of location or direction of travel.
3. The system shall always dispatch an available car to the lower dispatching terminal when no other car is parked or approaching this floor.
4. Select cars for dispatch by a non-sequence selection system. The system shall select from available cars and assign cars for loading. Select cars in the order of arrival at the dispatching terminal.

C. Two-way dispatching shall function during periods of appreciable traffic demand in both the up and down directions. Dispatch the cars up or down as appropriate to respond to the prevailing traffic demand. Each car shall answer unassigned landing calls ahead of it in its direction of travel until all calls not subject to load bypass have been answered. The method of dispatching shall include:

1. Dispatching the cars from predetermined zones consisting of an approximate division of the floors served by the number of elevators in the group unless the anticipated traffic demands should dictate otherwise. A car, after responding to the last call in an unoccupied zone, shall become the available car for that zone. Other cars that become available shall be assigned to other zones. Available cars shall respond immediately to a demand in their respective zones, except an available car shall respond to a demand in an unoccupied

zone, or if the demand in a zone exceeds an adjustable predetermined number, an additional available car shall be dispatched to that zone.

2. Available cars at landings shall be assigned and dispatched to answer service demands in a manner which shall provide equitable service to all floors.
3. An available car without a demand for service shall park with its doors closed.
4. The dispatching method shall be flexible to provide efficient service for two-way traffic that becomes predominant in either the up or down direction.

D. Off-hour dispatching shall function when the traffic demands subside to a degree of very light or inactive status. As the cars become inactive, they shall park with doors closed in assigned zones or seek an unoccupied zone. Station one car at the lobby floor with doors closed. When a demand for service occurs, the car or cars in the zone of demand shall be placed back in service automatically in order to satisfy the demand.

E. Auxiliary Landing Call Operation: In the event of corridor call button circuit failure, elevators are to service each floor in both directions in a predetermined pattern without registration of a call within the elevators. Provide an illuminated signal in the group operation panel to indicate that emergency dispatch operation is in effect. Restoration of the landing call button system shall cause normal operation to resume.

F. Car lights and fan in the elevator shall not shut off when elevator is idle. Arrange circuits so that power to lights and outlets on top and bottom of car shall not be interrupted.

2.12D MACHINE ROOM MONITOR (CCTV): GROUP OPERATION

A. Install a monitor in the machine room located in the Group Dispatch Operation Cabinet. Provide separate cabinets for the passenger elevator group and for the service elevator group. Provide one keyboard for each terminal.

B. The CCTV shall contain indicators to provide the following information:
1. The floor where each elevator is currently located.

2. The direction that each elevator is currently traveling or is scheduled to travel.
3. The location and direction of currently registered hall calls.
4. Elevators that are currently out of service.
5. Elevators that are currently bypassing hall calls.
6. Elevators that are currently engaged in passenger transfers.
7. Operations program under which entire group is currently operating.
8. Zone divisions of the entire group.
9. Door positions.
10. Status indication for cars on independent service, car top inspection, stop switch activated, alarm activated, fire service, and earthquake protection activated, etc.

C. The maintenance terminal shall be suitable for all troubleshooting procedures related to the specific type microprocessor installed on this project.

2.13 LOAD WEIGHING

A. Provide means for weighing car load for each and every elevator. When load in a car reaches an adjustable predetermined level of the rated capacity, that car shall bypass registered landing calls until the load in the car drops below the predetermined level. Calls bypassed in this manner shall remain registered for the next car. The initial adjustment of the load weighting bypass setting shall be 60 to 100 percent.

2.14 ANTI-NUISANCE FEATURE

A. If weight in the car is not commensurate with the number of registered car calls, cancel car calls. Systems that employ either load weighing or door protective device for activation of this feature are acceptable.

2.15 FIREFIGHTERS' SERVICE

A. Provide Firefighters' Service as per ASME A17.1 Section 2.27.

B. Smoke Detectors:

1. Smoke detection devices that are designated for actuation of Elevator Phase I "FIRE SERVICE" response in each elevator lobby, top of hoistway, and machine room shall be provided by others.

a. Elevator lobby smoke detectors shall activate only the elevators sharing the corresponding or common lobby.
b. Top of hoistway smoke detectors shall activate fire recall and the top of hoistway motorized vent.
c. Elevator or group of elevators serving separate isolated areas of the same floor shall have an independent smoke detection system.
d. Machine room smoke detectors shall activate fire recall for each and every elevator with equipment located in that machine room.
e. Hoistway ventilation, provided by others, located at the top of hoistway for elevators that penetrate more than three floors and meets the requirements of ASME A17.1 Section 2.1.4 and IBC Section 3004. The vent shall stay closed under power. When the top of hoistway smoke detector is activated, the power is removed from the vent and the vent shall open. When the smoke detector is reset, the vent shall close by power.

2.16 MEDICAL EMERGENCY SERVICE

A. Provisions shall be made for calling elevator S5, and S6 on "Medical Emergency" operating independently from the dispatch signals and landing call signals. Provide a two-position, key-operated, or card swipe operated contact, spring return switch at all floor levels
B. Install key switch or card swipe in the floor landing push button fixture above the push buttons.
C. Landing key switches shall be momentary pressure-spring return to "OFF" position. Provide a call registered light indicator adjacent to key switch. The landing key switch and the "Medical Emergency" key switch in the car shall not be operable by keys used for any other purpose in the hospital.
D. When switch is activated at any floor, the call register light indicator shall illuminate at that floor only, and the elevator supervisory control system shall instantly select the nearest available elevator in service to respond to the medical emergency call. Immediately upon selection, all car calls within that car shall be cancelled. Transfer any landing calls which had previously been assigned that car to another car. If the selected car is traveling away from the medical emergency call, it shall slow down and stop at the nearest floor, maintain closed doors, reverse direction and proceed

nonstop to the medical emergency call floor. If the selected car is traveling toward the medical emergency call floor, it shall proceed to that floor nonstop. If at the time of selection it is slowing down for a stop, the car shall stop, maintain doors closed, and start immediately toward the medical emergency floor.

E. Arriving at the medical emergency floor, the car shall remain with doors open for 30 seconds. After this interval has expired and the car has not been placed on medical emergency operation from within the car, the car shall automatically return to normal service.
   1. Locate a "Medical Emergency" key switch in the upper section of each main car operating panel for selecting medical emergency service. Activation of the key switch will allow the car to accept a car call for any floor, close doors, and proceed nonstop to the floor desired. The return of the key switch to normal position will restore the car to normal service. The key shall be removable only in the off position.

F. Any car in the group which is in group service may be selected. Additional medical emergency calls, as they are registered in the system, shall cause additional cars to respond as described below, always on the basis of one medical emergency call per car.

G. Provide an LED illuminated indicator light next to the Medical Emergency key switch the same size as the Fire Service indicator. In the center of the rear cab panel provide a back lighted "MEDICAL EMERGENCY" LED illuminated display that shall flash on and off continuously when the car is assigned to this operation and until it is restored to normal service. "MEDICAL EMERGENCY" indicator shall be a photographic negative type 1830 mm (72 in.) to center above the floor, 152 mm (6 in.) wide X 76 mm (3 in.) high, with 12 mm (1/2 in.) high letters and legible only when illuminated.

H. All of the key switches in the "Medical Emergency" system for each and every elevator shall operate from the same key. The medical emergency call service key shall not operate any other key switch in the elevator system, nor shall any other key required by the elevator system be able to operate the medical emergency call service switches.

I. Should all the cars be operating on "Independent Service", the medical emergency service indicator lights in the car operating panel and rear

wall shall be illuminated, buzzer shall sound, and the "Audio Voice" system shall direct the attendant to return the car to automatic operation.

J. Should all the cars be out of service and unable to answer medical emergency calls, the call register light shall not illuminate.

K. Each switch faceplate shall have legible indelible legends engraved or etched to indicate its identity and positions. All letters in faceplates shall be 6 mm (1/4 in.) high, filled with black paint.

L. When Phase I fire recall is activated it shall over-ride elevators on medical emergency service and return them to the main or alternate fire service recall floor. When the fire emergency floor has been identified the attendants may complete their medical emergency run on Phase II firefighters' operation if life safety is not affected.

M. Provide four (4) keys for each "Medical Emergency" key cylinder furnished.

2.17 ELEVATOR MACHINE BEAMS

A. Overhead beams shall meet the requirements of ASME A17.1 Section 2.9 to support machines and machinery in place to prevent any part from becoming loose or displaced under the conditions imposed in service. Machine beams shall be designed as follows:

1. The load resting on the beams and supports shall include the complete weight of the machine, sheaves, controller, governor, and any other equipment, together with the portion of the machine room floor supported by the beams.
2. Two times the sum of the tensions in all wire ropes supported by the beams with rated load in the car.

2.18 GEARLESS AND GEARED TRACTION MACHINE

A. Gearless Traction Hoist Machine:

1. Gearless traction machine with an AC motor, brake, drive sheave, and deflector sheave mounted in proper alignment on an isolated bedplate.
2. Provide hoist machine mounted direct drive, digital, closed-loop velocity encoder.

3. Armature must be electrically balanced and together with motor coupling and brake, mechanically balanced.
4. The structural design of the motor shall insure perfect alignment of bearings. The rotating elements shall be dynamically balanced to minimize vibration.
5. Hoist machine shaft shall be supported by two bearings mounted on a bedplate or integral with machine frame. Shaft shall be of forged steel or close grain electric furnace cast steel.
6. Drive sheaves shall be free from cracks, sand holes, and other imperfections that would tend to injure the hoist ropes. Sheave shall be turned smooth and true with rope grooves of proper design to insure maximum traction and maximum life of the hoist ropes. Traction sheave shall be mechanically coupled to the hoist motor shaft centered in a positive manner.
7. Hoisting machine brake shall be drum or disc type and shall have the capacity to hold the elevator with 125 percent of rated load. Arrange brake circuits so that no current shall be applied to the brake coil prior to the establishment of the hoistway door interlock circuit, except during leveling, re-leveling, and hoistway access operation.

B. Geared Traction Hoist Machine:
1. Worm geared traction type with an AC motor, brake, gear, drive shaft, deflector sheave, and gear case mounted in proper alignment on an isolated bedplate.
2. Provide hoist machine mounted direct drive, digital, closed-loop velocity encoder.
3. Armature must be electrically balanced and together with motor coupling and brake, mechanically balanced.
4. The structural design of the motor shall insure perfect alignment of bearings. The rotating elements shall be dynamically balanced to minimize vibration.
5. Thrust bearings shall be ball, roller, or radial type, of the highest grade, designed to take thrust in both directions. Motor and sheave bearings shall be ball or roller type. Bearings shall be of ample size, self-aligning or pre-loaded, non-adjustable and arranged to eliminate backlash.

6. Hoisting machine brake shall be drum or disc type and shall have the capacity to hold the elevator with 125 percent of rated load. Arrange brake circuits so that no current shall be applied to the brake coil prior to the establishment of the hoistway door interlock circuit, except during leveling, re-leveling, and hoistway access operation.
7. Provide hoist machine drip pans to collect lubricant seepage.

2.20 SHEAVES

A. Provide deflector sheaves with a metal basket type guard mounted below the sheave and a guard to prevent ropes from jumping out of grooves. Securely fasten guard to sheave beams.
B. Two-to-one idler sheaves on car and counterweight, if used, shall be provided with metal guards that shall prevent foreign objects from falling between ropes and sheave grooves and accidental contact or injury to workers on top of the car. Fabricate sheave guards from not less than 10-gauge thick steel and install with minimum clearance between guard and cables to prevent ropes from jumping out of grooves.

2.21 HOIST ROPES

A. Provide elevator with the required number and size of ropes to insure adequate traction for the range of loads with a factor of safety not less than that required by ASME A17.1 Section 2.20. Hoisting ropes shall be preformed 8 x 19 or 8 x 25 traction steel, conforming to Federal Specification RR-W-410 with minimum nominal diameter of 0.50 inch. For machines located overhead, 6 x 19 preformed traction steel hoisting ropes may be used in lieu of 8 x 19 that meet the requirements of the sheave manufacturer, at the elevator contractor's option.
B. Securely attach a corrosion resistant metal data tag to one hoisting rope fastening on top of the elevator.
C. Provide wedge type shackles.

2.22 HOIST ROPE COMPENSATION

A. Provide compensation when required by controller manufacturer for elevators with travel of 15.15 m (50ft) or more. Compensation shall consist of a necessary number and size of encapsulated chains or

whisper flex attached to the underside of car and counterweight frames. Hoist rope compensation shall meet the requirements of ASME A17.1 Rule 2.21.4.

1. Provide pit guide to minimize chain sway.
2. Provide take-up to compensate for hoist rope stretch.
3. Pad areas where compensation may strike car or hoistway items.

2.23 GOVERNOR ROPE

A. Governor Rope shall be 6 x 19 or 8 x 19 wire rope, preformed traction steel, uncoated, fiber core, conforming to Federal Specification RR-W-410 with minimum nominal diameter of 0.375 inch having a minimum safety factor of 5. Tiller rope construction is not acceptable.

B. Under normal operation rope shall run free and clear of governor jaws, rope guards, and other stationary parts.

C. Securely attach governor rope tag to governor rope releasing carrier. Data tag shall be corrosion-resisting metal and bear data as required by ASME A17.1 Section 2.18.

2.24 SPEED GOVERNOR

A. Provide Centrifugal type car driven governor, in accordance with ASME A17.1 Section 2.18, to operate the car safety device and counterweight governor to operate the counterweight safety device. Governor shall be complete with weighted pit tension sheave, governor release carrier and mounting base with protected cable sleeves.

B. Furnish over-speed switch and speed reducing switches when required.

C. The governor rope clamping device shall be designed so that no appreciable damage to or deformation of the governor rope shall result from the stopping action of the device in operating the safety.

D. Provide anti-friction metal bearings for the governor and pit tension sheaves. Bearing shall be either self-oiling or Zerk fitting type connections. Ball or roller bearings may be used in lieu of sleeve type.

E. Provide metal guard over top of governor rope and sheaves.

F. Governor, with the exception of finished surfaces, screw threads, etc., shall be factory painted and shall operate freely. Field painting of

governor parts shall be permitted in accordance with ASME A17.1 Rule 2.18.3.1.

G. Where the elevator travel does not exceed 100 feet, the weight tension sheave may be mounted on a pivoted steel arm in lieu of operating in steel guides.

2.25 CAR AND COUNTERWEIGHT SAFETY DEVICE

A. Provide "Type B Safeties" on the elevator//and counterweight// that meet the requirements of ASME A17.1 Section 2.17.

B. Field testing of car safety and governor shall be as specified in Section 3.7 PRETEST and TEST of this specification.

2.26 ASCENDING CAR OVERSPEED PROTECTION

A. Provide a device to prevent ascending over speed and unintended motion away from the landing when the doors are not locked in accordance with ASME A17.1 Section 2.19.

2.27 CAR AND COUNTERWEIGHT BUFFERS

A. Provide a minimum of two buffers for each car and one for each counterweight that meet the requirements of ASME A17.1 Section 2.22. Securely fasten buffers and supports to the pit channels and in the alignment with striker plates on car and counterweight. Each installed buffer shall have a permanently attached metal plate indicating its stroke and load rating. Buffer anchorage shall not puncture pit waterproofing.

B. Design and install buffers to provide minimum car runby required by ASME A17.1 Rule 2.4.2.

C. Furnish pipe stanchions and struts as required to properly support the buffer.

2.28 COUNTERWEIGHTS

A. Elevator shall be counterweighted with the weight of the car plus 40-50 percent of the rated capacity load as required by the controller manufacturer.

B. Furnish two (2) tie rods with cotter pins and double nuts at top and bottom. Install counterweight retainer plates or other approved means

on tie rods to prevent counterweight sub-weights from jumping and/or rattling. Both ends of tie-rods shall be visible and accessible.

C. Provide counterweight guards in the pit in accordance with ASME A17.1 Section 2.3.

2.29 CAR AND COUNTERWEIGHT ROLLER/SLIDE GUIDES

A. Provide car and counterweight with adjustable roller guides.

B. Each guide shall be of an approved type consisting of not less than three (3) wheels, each with a durable, resilient oil-resistant material tire rotating on ball bearings having sealed-in lubrication. Assemble rollers on a substantial metal base and mount to provide continuous spring pressure contact of all wheels with the corresponding rail surfaces under all conditions of loading and operation. Secure the roller guides at top and bottom on each side of car frame and counterweight frame. All mounting bolts shall be fitted with nuts, flat washers, split lock washers, and if required, beveled washers.

C. Provide sheet metal guards to protect wheels on top of car and counterweight.

D. Minimum diameter of car rollers shall be 150 mm (6 in.) unless the six wheel roller type is used. The entire elevator car shall be properly balanced to equalize pressure on all guide rollers. Cars shall be balanced in post-wise and front-to-back directions. Test for this balanced condition shall be witnessed at time of final inspection.

E. Minimum diameter of counterweight rollers shall not be less than 100 mm (4 in.). Properly balance counterweight frame to equalize pressure on all guide rollers. The Contractor shall have the option of furnishing, for counterweight only, mechanically adjusted roller guide in lieu of spring loaded roller guides as specified.

F. Equip all cars and counterweight with an auxiliary guiding device for each guide shoe which shall prevent the car or counterweight from leaving the rails in the event that the normal guides are fractured. These auxiliary guides shall not, during normal operation, touch the guiding surfaces of the rails. Fabricate the auxiliary guides from hot rolled steel plate and mount between the normal guide shoes and the car and counterweight frames. The auxiliary guides may be an extension of the normal guide shoe mounting plate if that plate is fabricated from

hot rolled steel. The portion of the auxiliary guide which shall come in contact with the rail guiding surfaces in the event of loss of the normal guides shall be lined with an approved bearing material to minimize damage to the rail guiding surfaces.

G. Alternate guide shoes for Freight Elevator: Install on car frame four flexible sliding swivel guide shoes each assembled on a substantial metal base, to permit individual self-alignment to the guide rails.
   1. Provide each shoe with renewable non-metallic gibs of durable material having low coefficient of friction and long-wearing qualities, when operated on guide rails receiving infrequent, light applications of rail lubricant. Gibs containing graphite or other solid lubricants are not acceptable.
   2. Flexible guide shoes of approved design, other than swivel type, may be used provided they are self-aligning on all three faces of the guide rails.
   3. Provide spring take-up in car guide shoes for side play between rails.

2.30 GUIDE RAILS, SUPPORTS AND FASTENINGS

A. Guide rails shall conform to ASME A17.1 Section 2.23.

B. Guide rails for car shall be planed steel T-sections and weigh 27.5 kg/m (18.5 lb/ft) Guide rails for counterweight shall be planed steel T-sections and weigh 22.5 kg/m (15 lb/ft).

C. Securely fasten guide rails to the brackets or other supports by heavy duty steel rail clips.

D. Provide necessary car and counterweight rail brackets and counterweight spreader brackets of sufficient size and design to secure substantial rigidity to prevent spreading or distortion of rails under any condition.
   1. Slotted or oversized holes shall be fitted with flat washers and shall conform to ASME A17.1 Rule 2.23.10.3.
   2. Where fastenings are over 4.2 m (14 ft) apart, rails shall be reinforced with 228 mm (9 in.) channel or approved equal backing to secure the rigidity required.

E. Rail joints and fishplates shall be in accordance with ASME A17.1 Rule 2.23.7. Rail joints shall not interfere with clamps and brackets.

Design rail alignment shims to remain in place if fastenings become loose.

F. Guide rails shall extend from channels on pit floor to within 76 mm (3 in.) of the underside of the concrete slab or grating at top of hoistway with a maximum deviation of 3.2 mm (1/8 in.) from plumb in all directions. Provide a minimum of 19 mm (3/4 in.) clearance between bottom of rails and top of pit channels.

G. Guide rail anchorages in pit shall be made in a manner that will not reduce effectiveness of the pit waterproofing.

H. In the event inserts or bond blocks are required for the attachment of guide rails, the Contractor shall furnish such inserts or bond blocks and shall install them in the forms before the concrete is poured. Use inserts or bond blocks only in concrete or block work where steel framing is not available for support of guide rails. Expansion-type bolting for guide rail brackets will not be permitted.

I. Guide rails shall be clean and free of any signs of rust, grease, or abrasion before final inspection. Paint the shank and base of the T-section with two field coats of manufacturer's standard enamel.

J. After completion of car safety testing during final inspection, all marks left on rails by application of car safety shall be filed smooth.

2.31 NORMAL AND FINAL TERMINAL STOPPING DEVICES

A. Normal and final terminal stopping devices shall conform to ASME A17.1 Section 2.25.

B. Mount terminal slowdown switches and direction limit switches on the elevator or in hoistway to reduce speed and bring car to an automatic stop at the terminal landings.

1. Switches shall function with any load up to and including 125 percent of rated elevator capacity at any speed obtained in normal operation.
2. Switches, when opened, shall permit operation of elevator in reverse direction of travel.

C. Mount final terminal stopping switches in the hoistway.

1. Switches shall be positively opened should the car travel beyond the terminal direction limit switches.
2. Switches shall be independent of other stopping devices.

3. Switches, when opened, shall remove power from hoist motor, apply hoist machine brake, and prevent operation of car in either direction.

D. After final stopping switches have been adjusted, through bolt switches to guide rail.

2.32 CROSSHEAD DATA PLATE AND CODE DATA PLATE

A. Permanently attach a non-corrosive metal Data Plate to car crosshead. Data plate shall bear information required by ASME A17.1 Section 2.16.3 and 2.20.2.1.

B. Permanently attach a Code Data Plate, in plain view, to the controller, ASME A17.1 Section 8.9.

2.33 WORKMAN'S LIGHTS AND OUTLETS

A. Provide duplex GFCI protected type receptacles and lamps with guards on top of each elevator car and beneath the platform. The receptacles shall be in accordance with Fed. Spec. W-C-596 for Type D7, 2-pole, 3-wire grounded type, rated for 15 amperes and 125 volts.

2.34 TOP-OF-THE CAR OPERATING DEVICE

A. Provide a car-top operating device that meets the requirements of ASME A17.1 Section 2.26.

B. The device shall be activated by a toggle switch mounted in the device. The switch shall be clearly marked "INSPECTION" and "NORMAL" on the faceplate, with 6 mm (1/4 in.) letters.

C. Movement of the elevator shall be accomplished by the continuous pressure on a direction button and a safety button.

D. Provide an emergency stop toggle type switch.

E. Provide permanent identification for the operation of all components in the device.

F. The device shall be permanently attached to the elevator crosshead on the side of the elevator nearest to the hoistway doors used for accessing the top of the car.

2.35 CAR LEVELING DEVICE

A. Car shall be equipped with a two-way leveling device to automatically bring the car to within 3 mm (1/8 in.) of exact level with the landing for which a stop is initiated regardless of load in car or direction.
B. If the car stops short or travels beyond the floor, the leveling device, within its zone shall automatically correct this condition and maintain the car within 3 mm (1/8 in.) of level with the floor landing regardless of the load carried.
C. Provide encoded steel tape, steel tape with magnets or steel vanes with magnetic switches. Submit design for approval.

2.36 EMERGENCY STOP SWITCHES

A. Provide an emergency stop switch for each top-of-car device, pit, machine spaces, service panel and firefighters' control panel inside the elevator. Mount stop switches in the pit adjacent to pit access door, at top of the pit ladder 1220 mm (48 in.) above the bottom landing sill and 1220 mm (48 in.) above the pit floor adjacent to the pit ladder.
B. Each stop switch shall be red in color and shall have "STOP" and "RUN" positions legibly and indelibly identified.

2.37 MAIN CAR OPERATING PANEL

A. Locate the main car operating panel in the car enclosure on the front return panel for passenger/service elevators and the front of the side wall for freight elevators. The top floor car call push button shall not be more than 1220 mm (48 in.) above the finished floor. Car call push buttons and indicator lights shall be round with a minimum diameter of 25 mm (1 in.), LED white light illuminated.
B. One piece front faceplate, with edges beveled 15 degrees, shall have the firefighters' service panel recessed into the upper section and the service operation panel recessed into the lower section, fitted with hinged doors. Doors shall have concealed hinges, be in the same front plane as the faceplate and fitted with cylinder type key operated locks. Secure the faceplate with stainless steel tamperproof screws.

C. All terminology on the main car operating panel shall be raised or engraved. Use 6 mm (1/4 in.) letters to identify all devices in upper section of the main car operating panel. The handicapped markings with contrasting background shall be recessed .030 inch in the faceplate, square or rectangular in shape, with the finished face of the 12 mm (1/2 in.) numerals and markings flush with the faceplates. Surface mounted plates are not acceptable.

D. The upper section shall contain the following items in order listed from top to bottom:

1. Engrave elevator number, 25 mm (1 in.) high with black paint for contrast.
2. Engrave capacity plate information with black paint for contrast with freight loading class and number of passengers allowed.
3. Emergency car lighting system consisting of a rechargeable battery, charger, controls, and LED illuminated light fixture. The system shall automatically provide emergency light in the car upon failure or interruption of the normal car lighting service, and function irrespective of the position of the light control switch in the car. The system shall be capable of maintaining a minimum illumination of 1.0 foot-candle when measured 1220 mm (48 in.)above the car floor and approximately 305 mm (12 in.) in front of the car operating panel, for not less than four (4) hours.
4. LED illuminated digital car position indicator with direction arrows. Digital display floor numbers and direction arrows shall be a minimum of 50mm (2 in.) high.
5. Firefighters' Emergency Operation Panel shall conform to the requirements of ASME A17.1 Section 2.27. Firefighters' Panel shall be 1676 mm (66 in.) minimum to 1830 mm (72 in.) maximum to the top of the panel above finished floor.
6. Firefighters' Emergency Indicator Light shall be round with a minimum diameter of 25 mm (1 in.).
7. Medical Emergency switch marked "MEDICAL EMERGENCY" with two positions labeled "ON" and "OFF" and Medical Emergency Indicator Light located next to the key switch shall be round with a minimum diameter of 25 mm (1 in.). Instruction for Medical Emergency operation shall be engraved below the key switch and light.

8. Key operated Independent Service; see Section 2.39 for detailed description.
9. Provide a Door Hold button on the faceplate next to the independent service key switch. It shall have "DOOR HOLD" indelibly marked on the button. Button shall light when activated. When activated, the door shall stay open for a maximum of one minute. To override door hold timer, push a car call button or door close button. Door Hold button is not ADA required and Braille is not needed.
10. Complete set of round car call push buttons, minimum diameter of 25 mm (1 in.), and LED white light illuminated, corresponding to the floors served. Car call buttons shall be legibly and indelibly identified by a floor number and/or letter not less than 12mm (1/2 in.) high in the face of the call button. Stack buttons in a single vertical column for low rise buildings up to six floors with front openings only.
11. Door Open and Door Close buttons shall be located below the car call buttons. They shall have "OPEN" and "CLOSE" legibly and indelibly identified by letters in the face of the respective button. The Door Open button shall be located closest to the door-jamb as required by ADA.

a. Rear Door Open and Rear Door Close buttons shall be located below the Front Door Open and Front Door Close buttons. They shall have "REAR OPEN" and "REAR CLOSE" legibly and indelibly identified by letters in the face of the respective button.

12. Red Emergency Alarm button that shall be located below the car operating buttons. Mount the emergency alarm button not lower than 890 mm (35 in.) above the finished floor. It shall be connected to audible signaling devices as required by A17.1 Rule 2.27.1.2. Provide audible signaling devices including the necessary wiring.
13. Emergency Help push button shall activate two way communications by Auto Dial telephone system as required by ASME A17.1 Rule 2.27.1.1.3. Help button shall be LED white light illuminated and flash when call is acknowledged. Legibly and indelibly label the button "HELP" in the face of the button with 12 mm (1/2 in.) high letters.

14. Provide a corresponding Braille plate on the left side of each button. The handicapped markings with contrasting background shall be recessed .030 inch in the faceplate, square or rectangular in shape, with the finished face of the 12 mm (1/2 in.) numerals and markings flush with the faceplates. Surface mounted plates are not acceptable.

E. The service operation panel, in the lower section shall contain the following items:
   1. Light switch labeled "LIGHTS" for controlling interior car lighting with its two positions marked "ON" and "OFF".
   2. Inspection switch that will disconnect normal operation and activate hoistway access switches at terminal landings. Switch shall be labeled "INSPECTION" with its two positions marked "ON" and "OFF".
   3. Three position switch labeled "FAN" with its positions marked "HIGH", "LOW" and "OFF" for controlling car ventilating blower.
   4. Two-position, spring return, toggle switch or push button to test the emergency light and alarm device. It shall be labeled "TEST EMERGENCY LIGHT AND ALARM".

2.38 AUXILIARY CAR OPERATING PANEL

A. Provide an auxiliary car operating panel in the front return panel opposite the main car operating panel side wall of the elevator between the handrails immediately adjacent to the front entrance column strike jamb. The auxiliary car operating panel shall contain only those controls essential to passenger (public) operation. The auxiliary car operating panel faceplate shall match the main car operating panel faceplate in material and general design. Secure the faceplate with stainless steel tamperproof screws.
   1. Mount door "OPEN" and door "CLOSE" buttons closest to the door jamb and mount the alarm button no lower than 875 mm (35 in.) above the finished floor. The Door Open button shall be located closest to the door as required by ADA.
   2. Complete set of round car call push buttons, minimum diameter 25 mm (1 in.), and LED white light illuminated, corresponding to the floors served. Car call button shall be legibly and indelibly identified by a floor number and/or letter not less than 12 mm (1/2

in.) high in the face of the call button corresponding to the numbers of the main car operating buttons. Install buttons in a vertical stack on front mounted panel up to six floors and horizontally for side mounted panel.

3. Cross-connect all buttons in the auxiliary car operating panels to their corresponding buttons in the main car operating panel. Registration of a car call shall cause the corresponding button to illuminate in the main and auxiliary car operating panel.
4. Emergency Help push button shall activate two way communications by Auto Dial telephone system as required by ASME A17.1 Rule 2.27.1.1.3. Help button shall be LED white light illuminated and flash when call is acknowledged. Legibly and indelibly label the button "HELP" in the face of the button with 12 mm (1/2 in.) high letters. Install emergency telephone system in the auxiliary car operating panel.
5. Provide a corresponding Braille plate on the left side of each button. The handicapped markings with contrasting background shall be recessed .030 inch in the faceplate, square or rectangular in shape, with the finished face of the 12 mm (1/2 in.) numerals and markings flush with the faceplates. Surface mounted plates are not acceptable.

2.39 INDEPENDENT SERVICE

A. Provide a legibly and indelibly labeled "INDEPENDENT SERVICE", two-position key operated switch on the face of the main car operating panel that shall have its positions marked "ON" and "OFF". When the switch is in the "ON" position, the car shall respond only to calls registered on its car dispatch buttons and shall bypass all calls registered on landing push buttons. The car shall start when a car call is registered, car call button or door close button is pressed, car and hoistway doors are closed, and interlock circuits are made. When switch is returned to "OFF" position, normal service shall be resumed.

2.40 CAR POSITION INDICATOR

A. Provide an alpha-numeric digital car position indicator in the main car operating panel, consisting of numerals and arrows not less than 50 mm

(2 in.) high, to indicate position of car and direction of car travel. Locate position indicator at the top of the main car operating panel, illuminated by light emitting diodes.

2.41 AUDIO VOICE SYSTEM

A. Provide digitized audio voice system activated by stopping at a floor. Audio voice shall announce floor designations, direction of travel, and special announcements. The voice announcement system shall be a natural sounding human voice that receives messages and shall comply with ADA requirements for audible car position indicators. The voice announcer shall have two separate volume controls, one for the floor designations and direction of travel, and another for special announcements. The voice announcer shall have a full range loud speaker, located on top of the cab. The audio voice unit shall contain the number of ports necessary to accommodate the number of floors, direction messages, and special announcements. Install voice announcer per manufacturer's recommendations and instructions. The voice system shall be the product of a manufacturer of established reputation. Provide manufacturer literature and list of voice messages.

1. Fire Service Message
2. Medical Emergency Service Message
3. "Please do not block doors"
4. Provide special messages as directed by Resident Engineer.

2.42 AUTO DIAL TELEPHONE SYSTEM

A. Furnish and install a complete ADA compliant intercommunication system.
B. Provide a two-way communication device in the car with automatic dialing, tracking and recall features with shielded wiring to car controller in machine room. Provide dialer with automatic rollover capability with minimum two numbers.
C. "HELP" button shall illuminate and flash when call is acknowledged. Button shall match floor push button design.
D. Provide "HELP" button tactile symbol engraved signage and Braille adjacent to button mounted integral with car operating panels.

E. The auto dial system shall be located in the auxiliary car operating panel. The speaker and unit shall be mounted on the backside of the perforated stainless steel plate cover.
F. Each elevator shall have individual phone numbers.
G. If the operator ends the call, the phone shall be able to redial immediately.

2.43 CORRIDOR OPERATING DEVICE FACEPLATES

A. Fabricate faceplates for elevator operating and signal devices from not less than 3 mm (1/8 in.) thick flat stainless steel with all edges beveled 15 degrees. Install all faceplates flush with surface on which they are mounted.
B. Corridor push button faceplates shall be at least 127 mm (5 in.) wide by 305 mm (12 in.) high. The centerline of the landing push buttons shall be 1067 mm (42 in.) above the corridor floor.
C. Elevator Corridor Call Station Pictograph shall be engraved in the faceplate.
D. Fasten all car and corridor operating device and signal device faceplates with stainless steel tamperproof screws.
E. Design corridor push button faceplates so that pressure on push buttons shall be independent of pressure on push button contacts.
F. Engraved legends in faceplates shall have lettering 6 mm (1/4 in.) high filled with black paint.
G. Provide a corresponding Braille plate on the left side of each button. The handicapped markings with contrasting background shall be recessed .030 inch in the faceplate, square or rectangular in shape, with the finished face of the 12 mm (1/2 in.) numerals and markings flush with the faceplates. Surface mounted plates are not acceptable.

2.44A CORRIDOR OPERATING DEVICES FOR PASSENGER/SERVICE ELEVETORS

A. Provide one risers of landing call buttons located as shown on contract drawings.
B. Fixtures for intermediate landings shall contain "UP" and "DOWN" buttons. Fixtures for terminal landings shall contain a single "UP" or "DOWN" button.

C. Each button shall contain an integral registration LED white light which shall illuminate upon registration of a call and shall extinguish when that call is answered.
D. The direction of each button shall be legibly and indelibly identified by arrows not less than 12 mm (1/2 in.) high in the face of each button.
E. Two or more risers of landing call buttons, if specified, shall be cross-connected so that either "UP" or "DOWN" buttons at a floor shall be capable of registering a call to that floor for the entire elevator group. Registration of a landing call shall illuminate "UP" or "DOWN" buttons simultaneously, and upon satisfaction of that call, both buttons shall be extinguished simultaneously.
F. Landing push buttons shall not re-open the doors while the car and hoistway doors are closing at that floor, the call shall be registered for the next available elevator. Calls registered shall be canceled if closing doors are re-opened by means of "DOOR OPEN" button or infrared curtain unit.

2.44B CORRIDOR OPERATING DEVICES FOR FREIGHT ELEVATORS

A. Provide one riser of landing call buttons located on the doorlock release side of the entrances for each and every freight elevator in this specification.
B. Fixtures for intermediate landings shall contain "UP" and "DOWN" buttons. Fixtures for terminal landings shall contain a single "UP" or "DOWN" button.
C. Each button shall contain an integral registration LED white light which shall illuminate upon registration of a call and shall extinguish when that call is answered.
D. The direction of each button shall be legibly and indelibly identified by arrows not less than 12 mm (1/2 in.) high in the face of each button.
E. Provide in each hall station a momentary pressure door "OPEN" button and a continuous pressure door "CLOSE" button. These devices shall be inoperative unless the car is at the respective landing.

2.45 DIGITAL CORRIDOR LANTERN/POSITION INDICATOR

A. Provide each car with combination corridor lantern/position indicator digital display mounted over the hoistway entrances at each and every floor. Provide each terminal landing with "UP" or "DOWN", minimum 64 mm (2 1/2 in.) high digital arrow lanterns and each intermediate landing with "UP" and "DOWN" digital arrow lanterns. Each lens shall be LED illuminated of proper intensity, so shielded to illuminate individual lens only. The lenses in each lantern shall be illuminated green to indicate "UP" travel and red to indicate "DOWN" travel. Lanterns shall signal in advance of car arrival at the landing indicating the direction of travel whether or not corridor button has been operated at that floor. Hall calls shall receive immediate assignment to individual cars and hall lantern shall sound and illuminate. Corridor lanterns shall not be illuminated when a car passes a floor without stopping. Each lantern shall be equipped with a clearly audible electronic chime which shall sound once for "UPWARD" bound car and twice for "DOWNWARD" bound car. Audible signal shall not sound when a car passes the floor without stopping. Provide adjustable sound level on audible signal. Car riding lanterns are not acceptable.

B. Provide alpha-numeric digital position indicators directly over hoistway landing entranceways between the arrival lanterns at each and every floor. Indicator faceplate shall be stainless steel. Numerals shall be not less than 50 mm (2 in.) high with direction arrows. Cover plates shall be readily removable for re-lamping. The appropriate direction arrow shall be illuminated during entire travel of car in corresponding direction.

C. Provide LED illumination in each compartment to indicate the position and direction the car is traveling by illuminating the proper alpha-numeric symbol. When the car is standing at a landing without direction established, arrows shall not be illuminated.

2.46 HOISTWAY ACCESS SWITCHES

A. Provide hoistway access switches for elevator at top terminal landing to permit access to top of car, and at bottom terminal landing to permit access to pit. Elevators with side slide doors, mount the access key switch 1830 mm (6 ft) above the corridor floor in the wall next to the strike jamb. Elevators with center opening doors, mount the access key switch 1830 mm (6 ft) above the corridor floor next to the hoistway

entrance jamb. Exposed portion of each access switch or its faceplate shall have legible, indelible legends to indicate "UP", "DOWN", and "OFF" positions. Submit design and location of access switches for approval. Each access switch shall be a constant pressure cylinder type lock having not less than five pins or five stainless steel disc combination with key removable only when switch is in the "OFF" position. Lock shall not be operable by any other key which will operate any other lock or device used for any other purpose at the VA Medical Center. Arrange the hoistway switch to initiate and maintain movement of the car. When the elevator is operated in the down direction from the top terminal landing, limit the zone of travel to a distance not greater than the top of the car crosshead level with the top floor.

B. Provide emergency access for all hoistway entrances, keyways for passenger and service elevators and locked door release system (key access) for freight elevators.

2.47 HOISTWAY ENTRANCES: PASSENGER/SERVICE ELEVATORS

A. Provide entrances of metal construction using cold rolled steel. Door frames shall be constructed of stainless steel. Complete entrances with sills, hanger supports, hangers, tracks, angle struts, unit frames, door panels, fascia plates, toe guards, hardware, bumpers, sight guards, and wall anchors.

B. Provide one piece extruded nickel silver sills with non-slip wearing surface, grooved for door guides and recessed for fascia plates. Sills shall have overall height of not less than 19 mm (3/4 in.), set true, straight, and level, with hoistway edges plumb over each other, and top surfaces flush with finished floor. Grout sills full length after installation.

C. Construct hanger supports of not less than 4.5 mm (3/16 in.) thick steel plate, and bolted to strut angles.

D. Structural steel angles 127 mm x 127 mm x 13 mm (5 in. x 5 in. x 1/2 in.) shall extend from top of sill to bottom of floor beam above, and shall be securely fastened at maximum 457 mm (18 in.) on center and at each end with two bolts.

E. Provide jambs and head soffits, of not less than 14-gauge stainless steel, for entrances. Jambs and head soffits shall be bolted or welded construction, and provided with three anchors each side. Side jambs shall be curved type. Radius of curvature shall be 89 mm (3 1/2 in.). Head jamb shall be square type, and shall overhang corridor face of side jambs by 6 mm (1/4 in.). Rigidly fasten jambs and head soffits to building structure. Provide jambs with protective covering. After installation, protect jambs and head soffits with wood framing to prevent damage to finish during construction. Solidly grout jambs.

F. Provide 14-gauge sheet steel fascia plates in hoistway to extend vertically from head of hanger support housing to sill above. Plates shall be the same width as the door opening of elevator and adequately reinforced to prevent waves and buckles. Below bottom terminal landing and over upper terminal landing provide shear guards beveled back to and fastened to the wall.

G. Provide hoistway entrance with flush two speed side slide center opening hoistway doors for Elevators Door panels shall be not less than 16-gauge stainless steel, flush type construction, and not less than 32 mm (1 1/4 in.) thick. Wrap stainless steel around the leading and trailing edges of the door panel. Top and bottom of door panels shall have continuous stiffener channels welded in place. Reinforcement of the door panels shall be approximately 1.0 mm (0.04 in.) in thickness and of the hat section type. At bottom of each and every panel, provide two removable laminated phenolic gibs or other approved material guides and a separate fire gib. Reinforce each door panel for hangers, interlock mechanism, drive assembly, and closer. One door panel for each entrance shall bear a BOCA label, Underwriters' label, or in lieu of this, labels from other accredited test laboratories may be furnished provided they are based on fire test reports and factory inspection procedures acceptable to the COTR. Fasten sight guard of 14-gauge stainless steel, extending full height of panel, to leading edge of doors.

H. Provide hangers for hoistway door panels and provide relating devices to transmit motion from one door panel to the other. Fasten the hangers to the door sections. Provide reinforcements at the point of attachment. The hanger shall have provisions for vertical and lateral

adjustments. Hang doors on two-point suspension hangers having sealed ball-bearing sheaves not less than 76 mm (3 in.) in diameter, with rubber or non-metallic sound-reducing tires mounted on a malleable iron or steel bracket. The hanger sheaves shall operate at a relatively low rotational speed, and shall roll on a high-carbon, cold-rolled or drawn steel track shaped to permit free movement of sheaves without regard to vertical adjustment of sheave, bracket or housing. Beneath the track and each hanger sheave, provide a hardened steel up-thrust roller capable of withstanding a vertical thrust equal to the carrying capacity of adjacent upper sheave. The up-thrust shall have fine vertical adjustments, and the face of the roller shaped so as to permit free movement of the hanger sheave. The up-thrust roller shall have ball or roller bearings. Provide the hanger sheaves with steel fire stops to prevent disengagement from tracks.

I. Do not use hangers that are constructed integrally with the door panels.

J. Provide raised numerals on cast, rear mounted plates for all openings. Numerals shall be a minimum of 50 mm (2 in.) high, located on each side of entrance frame, with centerline of 1524 mm (5 ft) above the landing sill. The number plates shall contain Braille.

K. Provide unique car number on every elevator entrance at designated main fire service floor level, minimum 76 mm (3 in.) in height.

2.48 ELECTRIC INTERLOCKS

A. Equip each hoistway door with an interlock, functioning as hoistway unit system, to prevent operation of car until all hoistway doors are locked in closed position. Hoistway door interlocks shall not be accepted unless they meet the requirements of ASME A17.1 Section 2.12.

B. Equip car doors with electric contact that prevents operation of car until doors are closed unless car is operating in leveling zone or hoistway access switch is used. Locate door contact to prevent its being tampered with from inside of car. Car door contact shall not be accepted unless it meets the requirements of ASME A17.1 Section 2.12.

C. Wiring installed from the hoistway riser to each door interlock shall be NEC type SF-2 or equivalent.

1. Type SF-2 cable terminations in the interlock housing shall be sleeved with glass braid fillers or equivalent.

D. Provide devices, either mechanical or electrical, that shall prevent operation of the elevator in event of damaged or defective door equipment that has permitted an independent car or hoistway door panel to remain in the "unclosed" and "unlocked" position.

2.49 CAR FRAME: PASSENGER/SERVICE ELEVATORS

A. Car frame shall conform to the requirements of ASME A17.1 Section 2.15, constructed of steel plates and structural shapes securely riveted, bolted, or welded together. Iron casting shall not be permitted. The entire assembly shall be rugged construction, and amply braced to withstand unequal loading of platform. Car frame members shall be constructed to relieve the car enclosure of all strains. Balance car front to back and side to side. Provide balancing weights and frames, properly located, to achieve the required true balance.

2.50 CAR PLATFORM: PASSENGER/SERVICE ELEVATORS

A. Construct the car platform to comply with all the requirements of ASME A17.1 Section 2.15.5. The platform shall be designed to withstand the forces developed under the loading conditions specified. Provide car entrances with extruded nickel silver sill or better with machined or extruded guide grooves. Cover underside and all exposed edges of wood filled platform with sheet metal of not less than 27-gauge, with all exposed joints and edges folded under. Fire resistant paint is not acceptable. Platform shall have flexible composition flooring not less than 3 mm (1/8 in.) thick. For color, see Section 09 06 00, SCHEDULE FOR FINISHES. Adhesive material shall be type recommended by manufacturer of flooring. Lay flooring flush with threshold plate and base.

B. Provide a platform guard (toe guard) that meets the requirements of ASME A17.1 Section 2.15.9, of not less than 12-guage sheet-steel on the entrance side, extend 76 mm (3 in.) beyond each side of entrance jamb. Securely brace platform guard to car platform, and bevel bottom edge at a 60-75 degree angle from horizontal. Install platform in the hoistway,

so that the clearance between front edge and landing threshold shall not exceed 32 mm (1 1/4 in.).

C. Isolate the platform from the car frame by approved rubber pads or other equally effective means.

D. Provide adjustable diagonal brace rods to hold platform firmly within car suspension frame.

E. Provide a bonding wire between frame and platform.

CAR ENCLOSURE: PASSENGER/SERVICE ELEVATORS

A. Car enclosure shall have a dome height inside the cab of 2440 mm (8 ft).

B. Securely fasten car enclosure to platform by through bolts located at intervals of not more than 457 mm (18 in.) running through an angle at the base of panels to underside of platform. Provide 6 mm (1/4 in.) bolts with nuts and lock washers.

C. Car enclosure base shall be of 14-gauge stainless steel, 152 mm (6 in.) high. Provide straight type base at front return sides. Vertical face of base at sides and rear shall be flush with or recessed behind the wainscot directly above the base. There shall be no exposed fastenings in base. Provide natural ventilation openings divided equally between the bottom and top of the car enclosure that shall provide a minimum 3.5 percent of the inside car floor area.

D. Construct canopy of not less than 12-gauge steel.

E. Car top railings that meet the requirement of ASME A17.1 Rules 2.14.1.7 and 2.10.2.

F. Front return wall panel, entrance columns, rear corner columns, entrance head-jamb and transom shall be 14-gauge stainless steel full height of car. Side and rear walls from top of base to top of panel shall be constructed of 14-gauge cold rolled steel. Side and rear walls up to 1220 mm (48 in.) above finished floor shall be covered with stainless steel. Side and rear walls from 1220 (48 in.) to the ceiling shall be covered with high-pressure plastic laminate. Apply directly to the cab walls or to 13 mm (1/2 in.) plywood/particle board that meets requirements of ASTM E 84, UL 723, and CAN/ULC-S102.2, whichever is applicable. Submit a method of fastening plywood/particle board to steel walls. It shall be flush with the face of the bottom section of

the stainless steel. Plastic laminate shall comply with Federal Specification L-P-508, Style Type 1, and Class 1. Color is specified in Section 09 06 00, SCHEDULE FOR FINISHES, Interior shall be flush panel construction with angles welded on exterior to insure adequate rigidity. Coat exterior of panels with mastic sound insulation material approximately 2.5 mm (3/32 in.) thick followed by a prime coat of paint. Mastic material shall conform to ASTM E1042.

1. Smooth and flush all joints with no ragged or broken edges. Plastic laminate shall comply with NEMA LD-3, textured finish, general purpose type, grade designation GP 50, and 0.050 in. thickness, except with a minimum wear resistance of 1200 cycles, and backer sheet, grade designation BK 20, and 0.020 in. thickness.

G. Provide a hinged top emergency exit cover. Exit shall be unobstructed when open and shall have mechanical stops on the cover. Provide a code approved exit switch to prevent operation of the elevator when the emergency exit is open.

H. Provide duplex, GFCI protected type receptacle in car. Locate flush-mounted receptacle on the centerline of the main car operating panel, 150 mm (6 in.) above the car floor.

I. Lighting for passenger elevators:

1. Provide aluminum hanging ceiling frame. Construct frame of 1/8 in. x 1 1/2 in. x 1 1/2 in. "T" and "L" sections, divide ceiling into six panels.
2. Provide fluorescent or LED illuminated car light fixtures above the ceiling panels. See Specification 265100, Interior Lighting for fixture and ballast type. Maintain a minimum light level of 50-foot candles at 914 mm (36 in.) above the finished floor.

J. Lighting for service elevators:

1. Provide car lighting with indirect fluorescent or LED lamps mounted in lighting coves along each side of the cab ceiling, front to back. See Specification 265100, Interior Lighting for fixture and ballast type. Maintain a minimum light level of 50-foot candles at 914 mm (36 in.) above the finished floor.
2. Equip the lighting cove with asymmetrical reflectors having specular ALZAK (or equal) finish. Maintain a minimum light level of 50-foot

candles 914 mm (36 in.) above finished floor at the car operating panels.

3. Enclose the entire vertical space between the light trough outer edge and the cab canopy with approved opaque white or clear lumicite sheeting. Install the lumicite sheeting so that it is removable for cleaning and re-lamping.

K. Provide a blower unit arranged to exhaust through an opening in the canopy. Provide a stainless or chrome plated fan grill around the opening. Provide 2-speed fan, capable of rated free delivery air displacement of approximately 380 and 700 cfm at respective speeds. Mount fan on top of car with rubber isolation to prevent transmission of vibration to car structure. Provide screening over intake and exhaust end of blower. Provide a 3-position switch to control the unit in the service panel.

L. Provide car enclosure with two sets of stainless steel handrails.

1. 75mm (3 in.) wide x 9 mm (3/8 in.) thick flatstock located with centerlines 750 mm and 1050 mm (30 in. and 42 in.) above the car floor.
2. Locate handrails 38 mm (1 1/2 in.) from cab wall. Install handrails on two side and rear walls. Curve ends of handrails to walls. Conceal all handrail fastenings. Handrails shall be removable from inside the car enclosure.

M. Provide car entrance with single speed center opening horizontal sliding car doors. Construct door panels to be flush hollow metal construction, not less than 32 mm (1 1/4 in.) thick, consisting of one continuous piece 16-gauge stainless steel on car side face wrapped around the leading and trailing edges. Separate two plates by a sound-deadening material, and reinforce by steel shapes welded to the plates at frequent intervals. Reinforce panels as required for installation of hangers, power-operating and door-opening devices. Hang doors on two-point suspension hangers having sealed ball-bearing sheaves not less than 76 mm (3 in.) in diameter, with rubber or non-metallic sound-reducing tires. Equip hangers with adjustable ball-bearing rollers to take upward thrust of panels. Upthrust rollers shall be capable of being locked in position after adjustment to a maximum of .38 mm (1/64 in.) clearance. Provide two laminated phenolic gibs on each door panel.

Gibs shall be replaceable without removal of door panel. Provide door drive assembly, restrictor, gate switch, header, track, arms, and all related door hardware.

N. Provide each service elevator one set of protection pads of sufficient length to completely cover two sides, rear walls and front return of cab interior. Pads shall consist of a minimum of 6 mm (1/4 in.) thick glass fiber insulation securely sewn between flame resistant vinyl coated coverings. Insulation shall conform to ASTM E84, UL 723, NFPA 252, CAN/ULC S102.2, or ASTM C612. Color of the covering shall be approved by the Resident Engineer. Provide stainless steel pad buttons or hooks, spaced at intervals of not more than 150 mm (18 in.) to adequately support pads.

2.52 POWER DOOR OPERATORS: PASSENGER/SERVICE ELEVATORS

A. Provide a high-speed heavy duty door operator to automatically open the car and hoistway doors simultaneously when the car is level with the floor, and automatically close the doors simultaneously at the expiration of the door-open time. Provide solid-state door control with closed loop circuitry to constantly monitor and automatically adjust door operation based upon velocity, position, and motor current. Motor shall be of the high-internal resistance type, capable of withstanding high currents resulting from stall without damage to the motor. The door operator shall be capable of opening a car door and hoistway door simultaneously, at a speed of .762 m (2.5 ft) per second. The closing speed of the doors shall be .3 m (1 ft) per second. A reversal of direction of the doors from the closing to opening operation, whether initiated by obstruction of the infrared curtain or the door "OPEN" button, shall be accomplished within 38 mm (1.5 in.) maximum of door movement. Emphasis is placed on obtaining quiet interlock and door operation; smooth, fast, dynamic braking for door reversals, stopping of the door reversal, and stopping of the doors at extremes of travel. Construct all levers and drive arms operating the doors, of heavy steel members, and all pivot points shall have ball or roller bearings. Auxiliary automatic door closers required under ASME A17.1 Section 2.11.3 shall be torsion spring type

B. Hoistway doors and car gates shall be manually operable in an emergency without disconnecting the power door operating equipment unless the car is outside the unlocking zone.
   1. It shall not be possible for the doors to open by power unless the elevator is within the leveling zone.
   2. Provide infrared curtain unit. The device shall cause the car and hoistway doors to reverse automatically to the fully-open position should the unit be actuated while the doors are closing. Unit shall function at all times when the doors are not closed, irrespective of all other operating features. The leading edge of the unit shall have an approved black finish.

C. Should the doors be prevented from closing for more than a predetermined adjustable interval of 20 to 60 seconds by operation of the curtain unit, the doors shall stay open, the audio voice message and a buzzer located on the car shall sound only on automatic operation. **Do not provide door nudging.**
   1. If an obstruction of the doors should not activate the photo-electric door control device and prevent the doors from closing for more than a predetermined adjustable interval of 15 to 30 seconds, the doors shall reverse to the fully open position and remain open until the "Door Close" button re-establishes the closing cycle.

D. Provide door "OPEN" and "CLOSE" buttons. When the door "OPEN" button is pressed and held, the doors, if in the open position, shall remain open and if the doors are closing, they shall stop, reverse and re-open. Momentary pressure of the door "CLOSE" button shall initiate the closing of the doors prior to the expiration of the normal door open time.

PART 3 – EXECUTION

3.1 PREPARATION

A. Examine work of other trades on which the work of this Section depends. Report defects to the Resident Engineer in writing that may affect the work of this trade or equipment operation dimensions from site for preparation of shop drawings.

B. Ensure that shafts and openings for moving equipment are plumb, level and in line, and that pit is to proper depth, waterproofed and drained with necessary access doors, ladder and guard.
C. Ensure that machine room is properly illuminated, heated and ventilated, and equipment, foundations, beams correctly located complete with floor and access stairs and door.
D. Before fabrication, take necessary job site measurements, and verify where work is governed by other trades. Check measurement of space for equipment, and means of access for installation and operation. Obtain dimensions from site for preparation of shop drawings.
E. Ensure the following preparatory work, provided under other sections of the specification has been provided. If the Elevator Contractor requires changes in size or location of trolley beams or their supports and trap doors, etc., to accomplish their work, he must make arrangements, subject to approval of the Contracting officer, and include additional cost in their bid. Where applicable, locate controller near and visible to its respective hoisting machinery. Work required prior to the completion of the elevator installation:
   1. Supply of electric feeder wires to the terminals of the elevator control panel, including circuit breaker.
   2. Provide light and GFCI outlets in the elevator pit and machine room.
   3. Furnish electric power for testing and adjusting elevator equipment.
   4. Furnish circuit breaker panel in machine room for car and hoistway lights and receptacles.
   5. Supply power for cab lighting and ventilation from an emergency power panel specified in Division 26, ELECTRICAL.
   6. Machine room enclosed and protected from moisture, with self closing, self locking door and access stairs.
   7. Provide fire extinguisher in machine room.
F. Supply for installation, inserts, anchors, bearing plates, brackets, supports and bracing including all setting templates and diagrams for placement.

3.2 SPACE CONDITIONS

A. Attention is called to overhead clearance, pit clearances, overall space in machine room, and construction conditions at building site in

connection with elevator work. Addition or revision of space requirements, or construction changes that may be required for the complete installation of the elevators must be arranged for and obtained by the Contractor, subject to approval by Resident Engineer. Include cost of changes in bid that become a part of the contract. Provide proper, code legal installation of equipment, including all construction, accessories and devices in connecting with elevator, mechanical and electrical work specified.

B. Where concrete beams, floor slabs, or other building construction protrude more than 50 mm (2 in.) into hoistway, bevel all top surfaces of projections to an angle of at 75 degrees with the horizontal.

3.3 INSTALLATION

A. Perform work with competent Certified Elevator Mechanics and Apprentices skilled in this work and under the direct supervision of the Elevator Contractor's experienced foreman.

B. Set hoistway entrances in alignment with car openings, and true with plumb sill lines.

C. Erect hoistway sills, headers and frames prior to erection of rough walls and doors. Erect fascias and toe guards after rough walls are finished.

D. Install machinery, guides, controls, car and all equipment and accessories in accordance with manufacturer's instructions, applicable codes and standards.

E. Isolate and dampen machine vibration with properly sized sound-reducing anti-vibration pads.

F. Grout sills and hoistway entrance frames.

3.4 ARRANGEMENT OF EQUIPMENT

A. Clearance around elevator, mechanical and electrical equipment shall comply with applicable provisions of NEC. Arrange equipment in machine room so that major equipment components can be removed for repair or replacement without dismantling or removing other equipment in the same machine room. Locate controller near and visible to its respective hoisting machine.

3.5 WORKMANSHIP AND PROTECTION

A. Installations shall be performed by Certified Elevator Mechanics and Apprentices to best possible industry standards. Details of the installation shall be mechanically and electrically correct. Materials and equipment shall be new and without imperfections.

B. Recesses, cutouts, slots, holes, patching, grouting, refinishing to accommodate installation of equipment shall be included in the Contractor's work. All new holes in concrete shall be core drilled.

C. Structural members shall not be cut or altered. Work in place that is damaged or defaced shall be restored equal to original new condition.

D. Finished work shall be straight, plumb, level, and square with smooth surfaces and lines. All machinery and equipment shall be protected against dirt, water, or mechanical injury. At final completion, all work shall be thoroughly cleaned and delivered in perfect unblemished condition.

E. Beams, slabs, or other building construction protruding more than four inches into the hoistway, all top surfaces shall be beveled at an angle of at least 75 degrees to the horizontal.

F. Sleeves for conduit and other small holes shall project 50 mm (2 in.) above concrete slabs.

G. Hoist cables that are exposed to accidental contact in the machine room and pit shall be completely enclosed with 16-gauge sheet metal or expanded metal or guards.

H. Exposed gears, sprockets, and sheaves shall be guarded from accidental contact in accordance with ASME A17.1 Section 2.10.

3.6 CLEANING

A. Clean machine room and equipment.

B. Perform hoistway clean down.

C. Prior to final acceptance; remove protective coverings from finished or ornamental surfaces. Clean and polish surfaces with regard to type of material.

3.7 PAINTING AND FINISHING

A. Hoist machine, motor, shall be factory painted with manufacturer's standard finish and color.

B. Controller, sheave, car frame and platform, counterweight, beams, rails and buffers, except their machined surfaces, cams, brackets and all other uncoated ferrous metal items shall be painted one factory priming coat or approved equal.

C. Upon completion of installation and prior to final inspection, all equipment shall be thoroughly cleaned of grease, oil, cement, plaster and other debris. All equipment, except that otherwise specified as to architectural finish, shall then be given two coats of paint of approved color, conforming to manufacturer's standard.

D. Field painting of governors shall be in accordance with ASME A17.1 Rule 2.18.3.1.

E. Stencil or apply decal floor designations not less than 100 mm (4 in.) high on hoistway doors, fascias or walls within door restrictor areas as required by ASME A17.1 Rule 2.29.2. The color of paint used shall contrast with the color of the surfaces to which it is applied.

F. Elevator hoisting machine, controller, governor, main line shunt trip circuit breaker, safety plank, and cross head of car shall be identified by 100 mm (4 in.) high numerals and letters located as directed. Numerals shall contrast with surrounding color and shall be stenciled or decaled.

G. Hoistway Entrances of Passenger, and Service Elevators:

1. Door panels shall be parkerized or given equivalent rust resistant treatment and a factory finish of one coat of baked-on primer and one factory finish coat of baked-on enamel.
2. Fascia plates, top and bottom shear guards, dust covers, hanger covers, and other metalwork, including built-in or hidden work and structural metal, (except stainless steel entrance frames and surfaces to receive baked enamel finish) shall be given one approved prime coat in the shop, and one field coat of paint of approved color.

H. Hoistway Entrances of Freight Elevators:

1. Metal surfaces of doors and frames shall receive shop prime coat.

2. Finish painting, after installation, shall be one coat of paint of approved color. For color, see Section 09 06 00, SCHEDULE FOR FINISHES.

I. Elevator Cabs for Passenger and Service Elevators:
1. Interior and exterior steel surfaces shall be parkerized or given equivalent rust resistant treatment before finish is applied.
2. Interior steel surfaces shall be factory finished with one coat of baked on enamel or proxylin lacquer. For color, see Section 09 06 00, SCHEDULE FOR FINISHES.
3. Give exterior faces of car doors one finish coat of paint of medium gray color.

J. Elevator Cabs for Freight Elevators:
1. Give interior of cab one prime coat and a minimum of one coat of enamel. For color, see Section 09 06 00, SCHEDULE FOR FINISHES.
2. Give exterior of cab one prime coat and one finish coat of an approved paint.
3. All surfaces of door frames, door panels, and cab interior surfaces that become damaged or marred shall be restored to original condition before final acceptance of work.

3.8 PRE-TESTS AND TESTS

A. Pre-test the elevators and related equipment in the presence of the Resident Engineer or his authorized representative for proper operation before requesting final inspection. Conduct final inspection at other than normal working hours, if required by Resident Engineer.
1. Procedure outlined in the Inspectors Manual for Electric Elevators, ASME A17.2 shall apply.
a. Final test shall be conducted in the presence of and witnessed by an ASME QEI-1 Certified Elevator Inspector.
b. Government shall furnish electric power including necessary current for starting, testing, and operating machinery of each elevator.
2. Contractor shall furnish the following test instruments and materials on-site and at the designated time of inspection: properly marked test weights, voltmeter, amp probe, thermometers, direct

read tachometer, meg-ohm meter, vibration meter, sound meter, light meter, stop watch, and a means of two-way communication.

B. Inspect workmanship, equipment furnished, and installation for compliance with specification.

C. Balance Tests: The percent of counterbalance shall be checked by placing test weights in car until the car and counterweight are equal in weight when located at the mid-point of travel. If the actual percent of counter balance does not conform to the specification, the amount of counterweight shall be adjusted until conformance is reached.

D. Full-Load Run Test: Elevators shall be tested for a period of one hour continuous run with full contract load in the car. The test run shall consist of the elevator stopping at all floors, in either direction of travel, for not less than five or more than ten seconds per floor.

E. Speed Test: The actual speed of the elevator shall be determined in both directions of travel with full contract load, balanced load and no load in the elevator. Speed shall be determined by applying a certified tachometer to the car hoisting ropes or governor rope. The actual measured speed of the elevator with all loads in either direction shall be within three (3) percent of specified rated speed. Full speed runs shall be quiet and free from vibration and sway.

F. Temperature Rise Test: The temperature rise of the hoisting motor shall be determined during the full load test run. Temperatures shall be measured by the use of thermometers. Under these conditions, the temperature rise of the equipment shall not exceed 50 degrees Centigrade above ambient temperature. Test shall start when all machine room equipment is within five (5) degrees Centigrade of the ambient temperature. Other tests for heat runs on motors shall be performed as prescribed by the Institute of Electrical and Electronic Engineers.

G. Car Leveling Test: Elevator car leveling devices shall be tested for accuracy of leveling at all floors with no load in car, balanced load in car, and with contract load in car, in both directions of travel. Accuracy of floor level shall be within plus or minus 3 mm (1/8 in.) of level with any landing floor for which the stop has been initiated regardless of load in car or direction of travel. The car leveling device shall automatically correct over travel as well as under travel

and shall maintain the car floor within plus or minus 3 mm (1/8 in.) of level with the landing floor regardless of change in load.

H. Brake Test: The action of the brake shall be prompt and a smooth stop shall result in the up and down directions of travel with no load and rated load in the elevator. Down stopping shall be tested with 125 percent of rated load in the elevator.

I. Insulation Resistance Test: The elevator's complete wiring system shall be free from short circuits and ground faults and the insulation resistance of the system shall be determined by use of megohm meter, at the discretion of the Elevator Inspector conducting the test.

J. Safety Devices and Governor Tests: The safety devices and governor shall be tested as required by ASME A17.1 Section 8.10.

K. Overload Devices: Test all overload current protection devices in the system at final inspection.

L. Limit Stops:

1. The position of the car when stopped by each of the normal limit stops with no load and with contract load in the car shall be accurately measured.
2. Final position of the elevator relative to the terminal landings shall be determined when the elevator has been stopped by the final limits. The lower limit stop shall be made with contract load in the elevator. Elevator shall be operated at inspection speed for both tests. Normal limit stopping devices shall be inoperative for the tests.

M. Oil Buffer Tests: These tests shall be conducted with operating device and limit stops inoperative and with contract load in the elevator for the car buffer and with no load in the elevator for the counterweight buffer. Preliminary test shall be made at the lowest (leveling) speed. Final tests shall be conducted at contract speed. Buffers shall compress and return to the fully extended position without oil leakage.

N. Setting of Car Door Contacts: The position of the car door at which the elevator may be started shall be measured. The distance from full closure shall not exceed that required by ASME A17.1. The test shall be made with the hoistway doors closed or the hoistway door contact inoperative.

O. Setting of Interlocks: The position of the hoistway door at which the elevator may be started shall be measured and shall not exceed ASME A17.1 requirements.
P. Operating and Signal System: The elevator shall be operated by the operating devices provided and the operation signals and automatic floor leveling shall function in accordance with requirements specified. Starting, stopping and leveling shall be smooth and comfortable without appreciable steps of acceleration or deceleration.
Q. Performance of the Elevator supervisory system shall be witnessed and approved by the representative of the Resident Engineer.
R. Evidence of malfunction in any tested system or parts of equipment that occurs during the testing shall be corrected, repaired, or replaced at no additional cost to the Government, and the test repeated.
S. If equipment fails test requirements and a re-inspection is required, the Contractor shall be responsible for the cost of re-inspection; salaries, transportation expenses, and per-diem expenses incurred by the representative of the Resident Engineer.

3.9 INSTRUCTION OF VA PERSONNEL

A. Provide competent instruction to VA personnel regarding the operation of equipment and accessories installed under this contract, for a period equal to one eight hour day. Instruction shall commence after completion of all work and at the time and place directed by the Resident Engineer.
B. Written instructions in triplicate relative to care, adjustments and operation of all equipment and accessories shall be furnished and delivered to the Resident Engineer in independently bound folders. DVD recordings will also be acceptable. Written instructions shall include correct and legible wiring diagrams, nomenclature sheet of all electrical apparatus including location of each device, complete and comprehensive sequence of operation, complete replacement parts list with descriptive literature, and identification and diagrammatic cuts of equipment and parts. Information shall also include electrical operation characteristics of all circuits, relays, timers, and electronic devices, as well as R.P.M. values and related characteristics for all rotating equipment.

C. Provide supplementary instruction for any new equipment that may become necessary because of changes, modifications or replacement of equipment or operation under requirements of paragraph entitled "Warranty of Construction".

3.10 INSPECTIONS AND SERVICE: GUARANTEE PERIOD OF SERVICE

A. Furnish complete inspection and maintenance service on entire elevator installation for a period of one (1) year after completion and acceptance of all the elevators in this specification by the Resident Engineer. This maintenance service shall run concurrently with the warranty. Maintenance work shall be performed by Certified Elevator Mechanics and Apprentices employed and supervised by the company that is providing guaranteed period of service on the elevator equipment specified herein.

B. This contract will cover full maintenance including emergency call back service, inspections, and servicing the elevators listed in the schedule of elevators. The Elevator Contractor shall perform the following:

1. Bi-weekly systematic examination of equipment.
2. During each maintenance visit the Elevator Contractor shall clean, lubricate, adjust, repair and replace all parts as necessary to keep the equipment in first class condition and proper working order.
3. Furnishing all lubricant, cleaning materials, parts and tools necessary to perform the work required. Lubricants shall be only those products recommended by the manufacturer of the equipment.
4. Equalizing tension, shorten or renew hoisting ropes where necessary to maintain the safety factor.
5. As required, motors, controllers, selectors, leveling devices, operating devices, switches on cars and in hoistways, hoistway doors and car doors or gate operating device, interlock contacts, guide shoes, guide rails, car door sills, hangers for doors, car doors or gates, signal system, car safety device, governors, tension and sheaves in pit shall be cleaned, lubricated and adjusted.
6. Guide rails, overhead sheaves and beams, counterweight frames, and bottom of platforms shall be cleaned every three months. Car tops and machine room floors shall be cleaned monthly. Accumulated

rubbish shall be removed from the pits monthly. A general cleaning of the entire installation including all machine room equipment and hoistway equipment shall be accomplished quarterly. Cleaning supplies and vacuum cleaner shall be furnished by the Contractor.

7. Maintain the performance standards set forth in this specification.
8. The operational system shall be maintained to the standards specified hereinafter including any changes or adjustments required to meet varying conditions of hospital occupancy.
9. Maintain smooth starting and stopping and accurate leveling at all times.

C. Maintenance service shall not include the performance of work required as a result of improper use, accidents, and negligence for which the Elevator Contractor is not directly responsible.

D. Provide 24 hour emergency call-back service that shall consist of promptly responding to calls within two hours for emergency service should a shutdown or emergency develop between regular examinations. Overtime emergency call-back service shall be limited to minor adjustments and repairs required to protect the immediate safety of the equipment and persons in and about the elevator.

E. Service and emergency personnel shall report to the Resident Engineer or his authorized representative upon arrival at the hospital and again upon completion of the required work. A copy of the work ticket containing a complete description of the work performed shall be given to the Resident Engineer or his authorized representative.

F. The Elevator Contractor shall maintain a log book in the machine room. The log shall list the date and time of all weekly examinations and all trouble calls. Each trouble call shall be fully described including the nature of the call, necessary correction performed or parts replaced.

G. Written "Maintenance Control Program" shall be in place to maintain the equipment in compliance with ASME A17.1 Section 8.6.

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SECTION 14 92 19
6" PNEUMATIC TUBES

PART 1 GENERAL

Presently, the existing VAMC Tampa hospital maintains a limited 6" pneumatic tube system manufactured by PEVCO that is primarily used for transporting specimens to the Laboratory. The existing 7 active stations are located in the following existing departments - main laboratory, PACU, 3 North, 3 South, outpatient lab, and the emergency department. The new bed tower project will require an extension of the current system by interconnecting the proposed system stations to the existing system and also provide service to the existing main pharmacy located on the ground level of the hospital. The existing system blower is located in the basement of the existing hospital below the main laboratory. This blower will be relocated in the new bed tower along with an additional blower that will serve the proposed new stations along with a super station to be located in the existing main pharmacy.

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM A 123/A 123M	(2008) Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA MG 1	(2007; Errata 2008) Standard for Motors and Generators

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70	(2007; AMD 1 2008) National Electrical Code - 2008 Edition

1.2 DESCRIPTION

The pneumatic tube system shall be a complete and operating system.

The Contractor shall become familiar with all details of the work and verify any discrepancy before performing the work.

Provide a 6" pneumatic-tube system, that is computer controlled and designed with 12 standard stations and 1 super station interconnected to permit automatic transmission of carriers from any station to any other

station. The system will be tied into the existing hospital p-tube system.

System components shall be designed and located in such a manner that in the event of a defect occurring, components may readily be removed and replaced. Carriers shall be the full access type similar to the existing p-tube carriers. Other system characteristics shall be as follows:

a. Destination selection by means of push buttons on the station control panel.

b. Carriers routed by means of diverters or in-line transfer units.

c. Carrier rejections indicated at the dispatching station for non-existing, signed-off, or malfunctioning station destinations. Reject station shall not be used.

d. Failure of one station shall not interfere with the normal functioning of any other station. Failure of any diverter will shut down that section of the system. Failure of an in-line sensor except zero-level sensor shall not shut down that section of the system.

e. Automatic sequencing of sending and receiving carriers.

f. Automatic recovery of a carrier will be required only after a transaction has been initiated and a failure occurs that prevents the completion. In such a case the carrier in process will be either returned to its source station or processed to the destination station after the failure has been repaired and cleared.

g. Selection of the shortest, most direct routing of all carriers to their destinations.

h. Complete "route proofing" of transaction paths before acceptance of the carrier to assure all components in the routing are operating.

i. Intra-zone transactions shall take the most direct path within the zone.

j. Self-adjusting priority within the system to load balance according to traffic.

k. Carriers may be positioned in senders simultaneously and destination selected on the station control panel.

l. Carriers in transit at the time a power failure occurs shall be delivered to their selected destinations upon restoration of power.

m. Processing of simultaneous, multiple transactions shall be directed to assure maximum operational efficiency of the system.

n. Carriers in transit at the time of station sign-off shall be delivered to their destination.

o. Carriers addressed to any non-existing or signed off station shall be rejected.

p. Automatic time clock sign off to allow any station to be automatically signed-off.

q. Preventive overload feature at station receiver. Carriers will not be dispatched to a station that is overloaded.

r. Automatic redistribution of empty carriers to return empty carriers to the locations with the greatest need.

s. Automatic purge by zone or system.

t. Each completed transaction, alarm condition that occurs and sign off schedule automatically printed out on printer

PART 2 PRODUCTS

2.1 STANDARD PRODUCTS

Provide all Materials and Equipment necessary for complete operation of the 6″ pneumatic tube system within the complex. Provide all standard products of a manufacturer similar and compatible with the current 6″ p-tube system in use within the existing hospital.

2.1.1 Stations

Stations shall be secured multi transaction processing type for medication transactions. The stations shall be wall mounted recessed enclosures.

Station Controls and Indicators shall consist of the following:

a. Carrier destination selectors, "Carrier Accepted" signal, "Send" buttons.

b. "Carrier Rejected" signal when a carrier cannot be dispatched because of destination sign off, an alarm condition, a non-existing selection or an overloaded station.

c. "Carrier in Receiver" to indicate a carrier is in the receiving unit when the carrier is not visible.

d. "Cancellation Button.

Non-operating requirements of control panel shall include the following:

a. "Operating Instructions" display.

b. Independent carrier dispatch and receive functions.

2.1.2 Carrier Tubing

Tubing for carrier transmission lines shall be OD 6 in 16 U.S. gauge OD galvanized electric welded steel with flash removed, conforming to ASTM A 123/A 123M. Air-lines shall be sized as required for proper system operation.

Tube Bends shall be of the same material as straight tubing, formed on the centerline to a radius of not less than (4 feet), free from wrinkles or distortion. Joints between sections shall be made with sleeve couplings, bolted couplings or bell end tubing.

2.1.3 Power Unit

Provide power units for as required. The power units shall be capable of operating all lines simultaneously and producing an average carrier speed of 20 fps. Power units shall be designed for floor or ceiling mounting. A timer or similar device shall shut the unit off after a predetermined time without carrier movement. Power units shall be complete with vibration isolators, intake and exhaust mufflers, in-take and exhaust piping, screen box, air valves if required, and shall be designed for easy access.

2.1.4 Automatic Central Control System

The proposed system expansion will tie into the existing central solid-state memory computer control system. The central computer control is located in the existing hospital. The existing components shall be utilized.

2.1.5 Automatic Switching Equipment

Diverters shall be automatically oriented to route carriers to or from intermediate stations. Units shall be air or electro-mechanically operated and designed to accommodate two or more stations or sublevels and enclosed in sheet metal housing with access panels.

Diverter shall be designed so that when a carrier does not clear the diverter completely, no other carrier can be routed to that diverter.

PART 3 EXECUTION

3.1 INSTALLATION

The pneumatic-tube system shall be installed as indicated and as recommended by the manufacturer.

3.1.1 Sound Insulation

Horizontal tubing and bends run over patient rooms or offices shall be sound deadened by applying a 38.1 mm thick layer of 24 kg/cubic meter density fiberglass insulation with a dust cover and taped joints over the tubing. Sound insulation material shall extend not less than 1.5 meters outside the patient rooms or offices. Insulation shall conform to EPA requirements in conformance with Section 01 62 35.00 50 RECYCLED /RECOVERED MATERIALS.

3.1.2 Hangers and Supports

Hangers and supports shall be spaced on 3 meters centers for horizontal runs of tubing. Vertical runs shall be supported at every floor. Each horizontal bend and in-line component shall be supported. Hangers for one or two lines of tubing shall be 10 mm plated and threaded rods attached to row clamps. Hangers for three or more lines shall be formed with row clamps or 38.1 mm channels laid flat against the bottom of the tubing and supported by not less than two rods spaced not more than 900 mm apart. Row clamps shall maintain centerlines of horizontal runs of multiple tubes straight and level and spaced apart in a consistent configuration.

3.1.3 Installation of Tubing

Joints shall be made airtight by methods recommended by the manufacturer. Lines shall be installed where indicated and securely held in place and braced against any motion caused by the passage of carriers. Tubing passing through openings in floors shall be installed in suitable sleeves or slots which shall be stuffed with 25 mm fiberglass blanket and sealed on both ends with a continuous bead of non-hardening mastic at least 6.4 mm deep.

3.1.4 Firewall Penetrations

Where holes are required in fire and smoke walls for the passage of tubing and other accessories, the annular space between pipe and hole shall be filled with a UL approved fireproof material.

3.1.5 Tests

Tests shall be conducted in accordance with the approved test procedures to determine that the system is functional, operational and installed in accordance with the specifications. The Contractor shall notify the Contracting Officer in writing 10 working days prior to conducting tests.

The following test shall be conducted:

a. Computer simulation and interrogation.

b. Consecutive dispatching to random stations within the zone.

c. Consecutive dispatching to random stations outside the zone.

d. Multi-station dispatching within the zone where all dispatchers are loaded with carriers, random stations selected and dispatching begins.

e. Multi-station dispatching outside the zone where all dispatchers are loaded with carriers, random stations selected and dispatching begins.

f. Two stations in each zone will be randomly selected to dispatch carriers into other zones.

3.1.6 Manufacturer's Services

Services of a manufacturer's representative who is experienced in the installation, adjustment, and operation of the equipment specified shall be provided. The representative shall supervise the installation, adjustment, and testing of the equipment

-- End of Section --