

**SECTION 01 00 00**

**GENERAL REQUIREMENTS**

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## **SECTION 01 00 00 GENERAL REQUIREMENTS**

### **PART 1 - GENERAL**

#### **1.1 SAFETY REQUIREMENTS**

- A. Refer to section 01 35 26, SAFETY REQUIREMENTS for safety and infection control requirements.

#### **1.2 GENERAL INTENTION**

- A. Contractor shall completely prepare site for building operations, including selective demolition and relocation of existing utilities structures within the project area, furnish labor and materials to construct the project 620-334 New Community Living Center as required by these drawings and specifications.
- B. Visits to the site by Bidders may be made only by appointment with the Medical Center Engineering Officer.
- C. Offices of Triple C - The A/E Group, as Architect-Engineers, will render certain technical services during construction. Such services shall be considered as advisory to the Government and shall not be construed as expressing or implying a contractual act of the Government without affirmations by Contracting Officer or his duly authorized representative.
- D. All employees of general contractor and subcontractors shall comply with VA security management program and obtain permission of the VA police, be identified by project and employer, and restricted from unauthorized access.
- E. Prime Contractor Personal Minimum Requirements:
  - 1. As Required in other parts of the Project Manual and Contract Requirements the following are minimum requirements:
    - a. The Superintendent shall be an employee of the Prime Contractor or in writing assign a worksite competent superintendent with authority to act as the contractor, responsible for the day-to-day operations at the construction site, planning, quality control, verification of delivery of approved material and equipment, subcontractor coordination responsibilities and execution of the complete project as per the contract documents.
      - 1) Superintendent shall have no hands-on construction interaction. In addition, the superintendent shall provide proof to the COR regarding completion of 30 hour OSHA.
      - 2) Superintendent assigned to this project shall not be assigned to any other project and shall only have duties on one project at a time. The Superintendent shall sign-in at the beginning of each day of work and Sign-out at the end of the work day at the Office of Engineering Service. No work shall be performed by any contractors or subcontractors without the presence of the superintendent at the actual work site.
      - 3) The Superintendent shall be responsible for submitting daily work logs to the COR at the end of every work day.
    - b. Site Safety and Health Officer (SSHO) shall be a separate qualified individual from the Prime Contractor's Superintendent or CQC System Manager with duties only as the SSHO. See 01 35 26 SAFETY REQUIREMENTS for more information on roles and responsibilities for General Contractor's staff.
    - c. CQC System Manager shall be a separate qualified individual from the Prime Contractor's Superintendent or Site Safety and Health Officer (SSHO) with duties only as the CQC System Manager. See Section 01 45 00 Quality Control for more information on roles and responsibilities for CQC Personnel.

- d. The Prime contractor shall provide services of a Project Manager whose responsibilities would include but not be limited to providing support to the Superintendent at the job site and shall be responsible for finance related tasks and scheduling.
  - F. Dig Permit
    - 1. The contractor shall complete the VA dig permit with the COR and submit the Dig Safe notification prior to start of any excavation work.
  - G. Electrical Work Permit
    - 1. The contractor shall complete the VA Electrical Work Permit with the COR and submit to the COR a minimum of 72 hours prior to start of electrical work within the facility.
  - H. Welding and Cutting
    - 1. A Hot Work Permit is required. See Section 01 35 26, SAFETY REQUIREMENTS for requirements.
  - I. Contract Work Hours
    - 1. Normal working hours are 8:00 am to 4:30 pm. Contractors who wish to work other than “normal working hours” for work to be done during those hours must submit a written request to the Contracting Officer for approval. The request must state that the Contractor is requesting to work other than normal working hours at no additional expense to the Government. Such requests shall be coordinated with the COR and must be submitted to the CO two (2) working days in advance.
    - 2. For certain aspects of work the Contractor shall be required to work off duty hours to perform that part of the work, for continued operations of the Medical Center. After duty hours work shall be coordinated with and approved by the COR.
      - a. Noisy demolition work, work at building entrances, electrical or other utility work necessary to pass within, above, traverse hallway corridors, temporary shutdowns of utilities for tie-in.
  - J. Contractor shall perform work in accordance with requirements of **“ASHE Construction in a Healthcare Facility”**.
  - K. The contractor shall use the A/E provided Project Website for file sharing in addition to email distribution. This will be provided at the time of award.
  - L. Contractor shall provide Infection Control Plan as required by Memorandum 111-40, Subj: VHA Directive 7715 Safety and Health During Construction dated April 6, 2017. Submit to COR for approval prior to the start of work.
  - M. Prior to commencing work, general contractor shall provide proof that an OSHA designated “competent person” (CP) (29 CFR 1926.20(b)(2)) will maintain a presence at the work site whenever the general or subcontractors are present. CP will have authority letter.
  - N. Per VA Directive 1085, smoking, vaping and smokeless tobacco are prohibited on the grounds of VA facilities, including in vehicles. This Directive applies to all Prime Contractor and Subcontractor employees.
  - O. Pricing Proposal transparency requirements:
    - 1. This project requires pricing proposals to include breakdown pricing for the General Contractor and all subcontractors.
    - 2. All price proposals, shall including subcontractor pricing must include a breakdown of pricing per the format included with this Project Manual. Third-party inspections must be included as a line item in the price proposal. See example at the end of Section 00 41 13 BID FORM.
- 1.3 STATEMENT OF BID ITEM(S)**
- A. ITEM I, GENERAL CONSTRUCTION: Work includes general construction, alterations, roads, parking lot, walks, grading, drainage, necessary to a new standalone Community Living Center

General Requirements

that will house accommodations for a total of 28 Veteran Residents and provide community space for socialization and family interaction on a previously developed site where existing structures have already been removed.

- B. ALTERNATE NO. 1: REDUCE WATER AND ICE SHIELD COVERAGE. Refer to Drawings (Sheet A-103) for additional information.
  - 1. Eliminate 10 days from the construction schedule.
- C. ALTERNATE NO. 2: ELIMINATE TUNNEL (EAST LEG). Remove east leg of tunnel entirely.
  - 1. Eliminate 20 days from the construction schedule.
- D. ALTERNATE NO. 3: ELIMINATE FAUX WINDOWS AT CLERESTORY. Refer to plans for location.
  - 1. Eliminate 15 days from the construction schedule.
- E. ALTERNATE NO. 4: ELIMINATE WORK AT B6 CORRIDOR. Remove all work associated with B6 corridor.
  - 1. Eliminate 25 days from the construction schedule.
- F. ALTERNATE NO. 5: ELIMINATE CONCRETE. All sidewalk work to be removed with the exception of the fire egress path.
  - 1. Eliminate 20 days from the construction schedule.
- G. ALTERNATE NO. 6: ELIMINATE LANDSCAPE. (No gazebo is provided in this scope of work) Removal of all plants, outdoor seating, rock mulch, wood mulch, irrigation & irrigation controls.
  - 1. Eliminate 30 days from the construction schedule.
- H. ALTERNATE NO. 7: REDUCE PLATFORM AT CHILLER. Remove 156 SF of chiller maintenance platform.
  - 1. Eliminate 5 days from the construction schedule.
- I. ALTERNATE NO. 8: ELIMINATE NVR SECURITY. Remove security equipment.
  - 1. Eliminate 10 days from the construction schedule.
- J. ALTERNATE NO. 9: ELIMINATE LARGE PORCH. Remove porch concrete slab, shade structure, fence, gate & lighting/power.
  - 1. Eliminate 20 days from the construction schedule.
- K. ALTERNATE NO. 10: ELIMINATE SMALL PORCH-A. Remove porch concrete slab, shade structure, fence, gate & lighting/power.
  - 1. Eliminate 15 days from the construction schedule.
- L. ALTERNATE NO. 11: ELIMINATE SMALL PORCH-B. Remove porch concrete slab, shade structure, fence, gate & lighting/power.
  - 1. Eliminate 15 days from the construction schedule.
- M. ALTERNATE NO. 12: ELIMINATE ENTRANCE CANOPY. Remove Canopy 1 & 2 entirely including all lighting/power.
  - 1. Eliminate 25 days from the construction schedule.
- N. ALTERNATE NO. 13: ELIMINATE FENCE/ FAUX ROOFS AT RESIDENT ROOMS. Remove all decorative railing and roof facade detail at all resident rooms (27 LF of railing / 12 faux roof fronts).
  - 1. Eliminate 20 days from the construction schedule.
- O. ALTERNATE NO. 14: ELIMINATE PATIENT LIFTS TRACK EXTENSION. Eliminate patient lifts track extension into resident bathrooms (26 rooms affected) (full extension to bathrooms in bariatric rooms) (PT/OT lift will remain).
  - 1. Eliminate 30 days from the construction schedule.
- P. ALTERNATE NO. 15: ELIMINATE ASPHALT. Remove portion of asphalt and parking spaces entirely.

1. Eliminate 15 days from the construction schedule.
- Q. ALTERNATE NO. 16: ELIMINATE EXTERIOR SIGNAGE. Remove all exterior signage.
1. Eliminate 10 days from the construction schedule.
- R. The expected **construction period duration of 730 days** includes all pre-construction activity, construction, and post-construction testing, third-party inspections, Owner inspections, and commissioning. Contractor shall submit a comprehensive schedule of work in compliance with 01 32 16.15 PROJECT SCHEDULES (SMALL PROJECTS DESIGN/BID/BUILD).
1. Contractor shall submit and obtain approval for all project submittals including coordination drawings prior to beginning physical construction.
  2. Contractor shall perform Commissioning of all new systems and existing systems impacted by the project according to requirements in sections:
    - a. 01 91 00 – GENERAL COMMISSIONING REQUIREMENTS.
    - b. 07 08 00 – FACILITY EXTERIOR CLOSURE COMMISSIONING.
    - c. 21 08 00 – COMMISSIONING OF FIRE SUPPRESSION SYSTEMS.
    - d. 22 08 00 – COMMISSIONING OF PLUMBING SYSTEMS.
    - e. 23 08 00 – COMMISSIONING OF HVAC SYSTEMS.
    - f. 26 08 00 – COMMISSIONING OF ELECTRICAL SYSTEMS.
    - g. 27 08 00 – COMMISSIONING OF COMMUNICATIONS SYSTEMS.
    - h. 28 08 00 – COMMISSIONING OF SECURITY SYSTEMS.
    - i. 33 08 00 – COMMISSIONING OF SITE UTILITIES.
    - j. A detailed commissioning plan is required to ensure that all systems are calibrated, programmed, and all graphic displays are accurate and approved by applicable VA staff.

#### 1.4 SPECIFICATIONS AND DRAWINGS FOR CONTRACTOR

- A. Drawings and contract documents may be obtained from the website where the solicitation is posted. Additional copies will be at Contractor's expense.
- B. Refer to specifications for installation requirements for each Division. Refer to drawings for estimated quantities and schematic layouts/locations. Contractor to provide a complete, commissioned, functioning systems. Contractor shall provide all testing reports prior to the start of commissioning. This project will require night and weekend work, Renovation includes requirements for Testing and Balancing the HVAC for the existing and new systems configuration.

#### 1.5 CONSTRUCTION SECURITY REQUIREMENTS

- A. Security Plan:
  1. The security plan defines both physical and administrative security procedures that will remain effective for the entire duration of the project.
  2. The General Contractor is responsible for assuring that all sub-contractors working on the project and their employees also comply with these regulations.
- B. Security Procedures:
  1. General Contractor's employees shall not enter the project site without appropriate badge. They may also be subject to inspection of their personal effects when entering or leaving the project site.
  2. Before starting work the General Contractor shall give one week's notice to the Contracting Officer so that security arrangements can be provided for the employees. This notice is separate from any notices required for utility shutdown described later in this section.
  3. No photography of VA premises is allowed without written permission of the Contracting Officer.
  4. VA reserves the right to close down or shut down the project site and order General Contractor's employees off the premises in the event of a national emergency. The

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

- C. Guards:
1. The General Contractor shall provide unarmed guards at the project site after construction hours.
  2. The Contractor shall provide the guards and VA police with communication devices as directed.
  3. The general Contractor shall install equipment for recording guard rounds to ensure systematic checking of the premises.
- D. Key Control:
1. Contractor will be issued VA Keys and will require a signature confirming that they received the key(s) listed on signature form. General Contractor is responsible for returning these keys upon separation of project or at any time the VA requests. Lost or misplaced keys are to be reported to VA COR immediately and additional costs to replace keys and all cores associated with that key series will be calculated at that time with the VA Locksmith Shop and charged to the contractor.
  2. The General Contractor shall provide duplicate keys and lock combinations to the Contracting Officers Representative (COR) for the purpose of security inspections of every area of project including tool boxes and parked machines and take any emergency action.
  3. The General Contractor shall turn over all permanent lock cylinders to the VA locksmith for permanent installation. See Section 08 71 00, DOOR HARDWARE and coordinate.
- E. Document Control:
1. Before starting any work, the General Contractor/Sub Contractors shall submit an electronic security memorandum describing the approach to following goals and maintaining confidentiality of "sensitive information".
  2. The General 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.
  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 VA.
  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 following VA standards and procedures using an Engineering Document Management Software (EDMS).
    - a. Security, access and maintenance of all project drawings, both scanned and electronic shall be performed and tracked through the EDMS system.
    - b. "Sensitive information" including drawings and other documents may be attached to e-mail provided all VA encryption procedures are followed.
- F. Motor Vehicle Restrictions
1. Vehicle authorization request shall be required for any vehicle entering the site and such request shall be submitted 24 hours before the date and time of access. Access shall be restricted to picking up and dropping off materials and supplies.
  2. A limited number of (2 to 5) permits shall be issued for General Contractor and its employees for parking in designated areas only.

## 1.6 OPERATIONS AND STORAGE AREAS

- A. The Contractor shall confine all operations (including storage of materials) on Government premises to areas authorized or approved by the Contracting Officer. The Contractor shall hold and save the Government, its officers and agents, free and harmless from liability of any nature occasioned by the Contractor's performance.
- B. Temporary buildings (e.g., storage sheds, shops, offices) and utilities may be erected by the Contractor only with the approval of the Contracting Officer and shall be built with labor and materials furnished by the Contractor without expense to the Government. The temporary buildings and utilities shall remain the property of the Contractor and shall be removed by the Contractor at its expense upon completion of the work. With the written consent of the Contracting Officer, the buildings and utilities may be abandoned and need not be removed.
- C. The Contractor shall, under regulations prescribed by the Contracting Officer, use only established roadways, or use temporary roadways constructed by the Contractor when and as authorized by the Contracting Officer. When materials are transported in prosecuting the work, vehicles shall not be loaded beyond the loading capacity recommended by the manufacturer of the vehicle or prescribed by any Federal, State, or local law or regulation. When it is necessary to cross curbs or sidewalks, the Contractor shall protect them from damage. The Contractor shall repair or pay for the repair of any damaged curbs, sidewalks, or roads.
- D. **(FAR 52.236-10)**
- E. Working space and space available for storing materials shall be as shown on the drawings and as determined by the COR.
- F. Workers are subject to rules of Medical Center applicable to their conduct.
- G. Execute work in such a manner as to interfere as little as possible with work being done by others. Keep roads clear of construction materials, debris, standing construction equipment and vehicles at all times.
- H. Execute work so as to interfere as little as possible with normal functioning of Medical Center as a whole, including operations of utility services, fire protection systems and any existing equipment, and with work being done by others. Use of equipment and tools that transmit vibrations and noises through the building structure, are not permitted in buildings that are occupied, during construction, jointly by patients or medical personnel, and Contractor's personnel, except as permitted by COR where required by limited working space.
  - 1. Do not store materials and equipment in other than assigned areas.
  - 2. Schedule delivery of materials and equipment to immediate construction working areas within buildings in use by Department of Veterans Affairs in quantities sufficient for not more than two work days. Provide unobstructed access to Medical Center areas required to remain in operation.
  - 3. Where access by Medical Center personnel to vacated portions of buildings is not required, storage of Contractor's materials and equipment will be permitted subject to fire and safety requirements.
- I. Utilities Services: Where necessary to cut existing pipes, electrical wires, conduits, cables, etc., of utility services, or of fire protection systems or communications systems (except telephone), they shall be cut and capped at suitable places where shown; or, in absence of such indication, where directed by COR. All such actions shall be coordinated with the COR or 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.
- J. Phasing:

1. 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 COR 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:
  2. To ensure such executions, Contractor shall furnish the COR with a schedule of approximate phasing dates on which the Contractor intends to accomplish work in each specific area of site, building or portion thereof. In addition, Contractor shall notify the COR two weeks in advance of the proposed date of starting work in each specific area of site, building or portion thereof. Arrange such phasing dates to ensure accomplishment of this work in successive phases mutually agreeable to Medical Center Director, COR and Contractor, as follows:
    - a. Phase I: Construction of New CLC building
    - b. Phase II: Connection of new Connection Corridor to Building 6.
    - c. Warranty Phase:
      - 1) 4 month walk through
      - 2) 9 month walk through
- K. Building(s) No.(s) 6 will be occupied during performance of work; but immediate areas of alterations will be vacated.
1. Contractor shall take all measures and provide all material necessary for protecting existing equipment and property in affected areas of construction against dust and debris, so that equipment and affected areas to be used in the Medical Centers operations will not be hindered. Contractor shall permit access to Department of Veterans Affairs personnel and patients through other construction areas which serve as routes of access to such affected areas and equipment. These routes whether access or egress shall be isolated from the construction area by temporary partitions and have walking surfaces, lighting etc. to facilitate patient and staff access. Coordinate alteration work in areas occupied by Department of Veterans Affairs so that Medical Center operations will continue during the construction period.
  2. Immediate areas of alterations not mentioned in preceding Subparagraph 1 will be temporarily vacated while alterations are performed.
- L. Construction Fence: Before construction operations begin, Contractor shall provide a chain link construction fence, 2.4m (eight feet) minimum height, around the construction area indicated on the drawings. Provide gates as required for access with necessary hardware, including hasps and padlocks. Fasten fence fabric to terminal posts with tension bands and to line posts and top and bottom rails with tie wires spaced at maximum 375mm (15 inches). Bottom of fences shall extend to 25mm (one inch) above grade. Remove the fence when directed by COR .
- M. When a building and/or construction site is turned over to Contractor, Contractor shall accept entire responsibility including upkeep and maintenance therefore:
1. Contractor shall maintain a minimum temperature of 4 degrees C (40 degrees F) at all times, except as otherwise specified.
  2. Contractor shall maintain in operating condition existing fire protection and alarm equipment. In connection with fire alarm equipment, Contractor shall make arrangements for pre-inspection of site with Fire Department or Company (Department of Veterans Affairs or municipal) whichever will be required to respond to an alarm from Contractor's employee or watchman.
- N. Utilities Services: Maintain existing utility services for Medical Center at all times. Provide temporary facilities, labor, materials, equipment, connections, and utilities to assure uninterrupted services. Where necessary to cut existing water, steam, gases, sewer or air pipes, or conduits, wires, cables, etc. of utility services or of fire protection systems and

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

1. No utility service such as water, gas, steam, sewers or electricity, or fire protection systems and communications systems may be interrupted without prior approval of COR. Electrical work shall be accomplished with all affected circuits or equipment de-energized. When an electrical outage cannot be accomplished, work on any energized circuits or equipment shall not commence without a detailed work plan, the Medical Center Director's prior knowledge and written approval. Refer to specification Sections 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS, 27 05 11 REQUIREMENTS FOR COMMUNICATIONS INSTALLATIONS and 28 05 00, COMMON WORK RESULTS FOR ELECTRONIC SAFETY AND SECURITY for additional requirements.
  2. Contractor shall submit a request to interrupt any such services to COR, in writing, 7 days in advance of proposed interruption. Request shall state reason, date, exact time of, and approximate duration of such interruption.
  3. Contractor will be advised (in writing) of approval of request, or of which other date and/or time such interruption will cause least inconvenience to operations of Medical Center Cemetery. Interruption time approved by Medical Center may occur at other than Contractor's normal working hours.
  4. Major interruptions of any system must be requested, in writing, at least 15 calendar days prior to the desired time and shall be performed as directed by the COR.
  5. In case of a contract construction emergency, service will be interrupted on approval of COR. Such approval will be confirmed in writing as soon as practical.
  6. Whenever it is required that a connection fee be paid to a public utility provider for new permanent service to the construction project, for such items as water, sewer, electricity, gas or steam, payment of such fee shall be the responsibility of the Government and not the Contractor.
- O. Abandoned Lines: All service lines such as wires, cables, conduits, ducts, pipes and the like, and their hangers or supports, which are to be abandoned but are not required to be entirely removed, shall be sealed, capped or plugged at the main, branch or panel they originate from. The lines shall not be capped in finished areas, but shall be removed and sealed, capped or plugged in ceilings, within furred spaces, in unfinished areas, or within walls or partitions; so that they are completely behind the finished surfaces.
- P. To minimize interference of construction activities with flow of Medical Center traffic, comply with the following:
1. Keep roads, walks and entrances to grounds, to parking and to occupied areas of buildings clear of construction materials, debris and standing construction equipment and vehicles. Wherever excavation for new utility lines cross existing roads, at least one lane must be open to traffic at all times with approval.
  2. Method and scheduling of required cutting, altering and removal of existing roads, walks and entrances must be approved by the COR.
- Q. Coordinate the work for this contract with other construction operations as directed by COR. This includes the scheduling of traffic and the use of roadways, as specified in Article, USE OF ROADWAYS.

## 1.7 ALTERATIONS

- A. Survey: Before any work is started, the Contractor shall make a thorough survey with the COR and a representative of VA Supply Service, of areas of buildings in which alterations occur and areas which are anticipated routes of access, and furnish a report, signed by both, to the Contracting Officer. This report shall list by rooms and spaces:
1. Existing condition and types of resilient flooring, doors, windows, walls and other surfaces not required to be altered throughout affected areas of building.

2. Existence and conditions of items such as plumbing fixtures and accessories, electrical fixtures, equipment, venetian blinds, shades, etc., required by drawings to be either reused or relocated, or both.
  3. Shall note any discrepancies between drawings and existing conditions at site.
  4. Shall designate areas for working space, materials storage and routes of access to areas within buildings where alterations occur and which have been agreed upon by Contractor and COR.
- B. Any items required by drawings to be either reused or relocated or both, found during this survey to be nonexistent, or in opinion of COR and/or Supply Representative, to be in such condition that their use is impossible or impractical, shall be furnished and/or replaced by Contractor with new items in accordance with specifications which will be furnished by Government. Provided the contract work is changed by reason of this subparagraph B, the contract will be modified accordingly, under provisions of clause entitled "DIFFERING SITE CONDITIONS" (FAR 52.236-2) and "CHANGES" (FAR 52.243-4).
- C. Re-Survey: Thirty days before expected partial or final inspection date, the Contractor and COR together shall make a thorough re-survey of the areas of buildings involved. They shall furnish a report on conditions then existing, of resilient flooring, doors, windows, walls and other surfaces as compared with conditions of same as noted in first condition survey report:
1. Re-survey report shall also list any damage caused by Contractor to such flooring and other surfaces, despite protection measures; and, will form basis for determining extent of repair work required of Contractor to restore damage caused by Contractor's workers in executing work of this contract.
- D. Protection: Provide the following protective measures:
1. Wherever existing roof surfaces are disturbed they shall be protected against water infiltration. In case of leaks, they shall be repaired immediately upon discovery.
  2. Temporary protection against damage for portions of existing structures and grounds where work is to be done, materials handled and equipment moved and/or relocated.
  3. Protection of interior of existing structures at all times, from damage, dust and weather inclemency. Wherever work is performed, floor surfaces that are to remain in place shall be adequately protected prior to starting work, and this protection shall be maintained intact until all work in the area is completed.

## **1.8 DISPOSAL AND RETENTION**

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

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

- A. The Contractor shall preserve and protect all structures, equipment, and vegetation (such as trees, shrubs, and grass) on or adjacent to the work site, which are not to be removed and

which do not unreasonably interfere with the work required under this contract. The Contractor shall only remove trees when specifically authorized to do so, and shall avoid damaging vegetation that will remain in place. If any limbs or branches of trees are broken during contract performance, or by the careless operation of equipment, or by workers, 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 57 19, TEMPORARY ENVIRONMENTAL CONTROLS, for additional requirements on protecting vegetation, soils and the environment. Refer to Articles, "Alterations", "Restoration", and "Operations and Storage Areas" for additional instructions concerning repair of damage to structures and site improvements.
- 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. VA will make the permit application available at the (appropriate medical center) office. The apparent low bidder, 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:
  - 1. Designating areas for equipment maintenance and repair;
  - 2. Providing waste receptacles at convenient locations and provide regular collection of wastes;
  - 3. Locating equipment wash down areas on site, and provide appropriate control of washwaters;
  - 4. Providing protected storage areas for chemicals, paints, solvents, fertilizers, and other potentially toxic materials; and
  - 5. Providing adequately maintained sanitary facilities.

#### **1.10 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 COR. Existing work to be altered or extended and that is found to be defective in any way, shall be reported to the COR 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 workers 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 "DIFFERING SITE CONDITIONS" (FAR 52.236-2).

#### **1.11 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.
  - 1. The indications of physical conditions on the drawings and in the specifications are the result of site investigations by Terracon.  
(FAR 52.236-4)
- B. Subsurface conditions have been developed by core borings and test pits. Logs of subsurface exploration are shown diagrammatically on drawings.
- C. A copy of the soil report will be made available for inspection by bidders upon request to the Engineering Officer at the VA Medical Center, and attached to this Project Manual under Section 00 31 33, SUBSURFACE DRILLING AND SAMPLING INFORMATION, and shall be considered part of the contract documents.
- D. 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 Department of Veterans Affairs, bidders will be permitted to make subsurface explorations of their own at site.

#### **1.12 PROFESSIONAL SURVEYING SERVICES**

- A. 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.

#### **1.13 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 corner of column lines and/or addition to each existing 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 COR 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 COR before any major items of concrete work are placed. In addition, Contractor shall also furnish to the COR 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.
  - 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 COR.
- F. Upon completion of the work, the Contractor shall furnish the COR one electronic copy and reproducible drawings at the scale of the contract drawings, showing the finished grade on the grid developed for constructing the work, including burial monuments and fifty foot stationing along new road centerlines. These drawings shall bear the seal of the registered land surveyor or registered civil engineer.
- G. 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".

#### **1.14 AS-BUILT DRAWINGS**

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

#### **1.15 WARRANTY MANAGEMENT**

- A. Warranty Management Plan: Develop a warranty management plan which contains information relevant to FAR 52.246-21 Warranty of Construction in at least 30 days before the planned pre-warranty conference, submit four sets of the warranty management plan. Include within the

General Requirements

warranty management plan all required actions and documents to assure that the Government receives all warranties to which it is entitled. The plan must be in narrative form and contain sufficient detail to render it suitable for use by future maintenance and repair personnel, whether tradesman, or of engineering background, not necessarily familiar with this contract. The term "status" as indicated below must include due date and whether item has been submitted or was approved. Warranty information made available during the construction phase must be submitted to the Contracting Officer for approval prior to each monthly invoice for payment. Assemble approved information in a binder and turn over to the Government upon acceptance of the work. The construction warranty period will begin on the date of the project acceptance and continue for the product warranty period. A joint 4 month and 9 month warranty inspection will be conducted, measured from time of acceptance, by the Contractor and the Contracting Officer. Include in the warranty management plan, but not limited to, the following:

1. Roles and responsibilities of all personnel associated with the warranty process, including points of contact and telephone numbers within the company of the Contractor, subcontractors, manufacturers or suppliers involved.
  2. Furnish with each warranty the name, address and telephone number of each of the guarantor's representatives nearest project location.
  3. Listing and status of delivery of all Certificates of Warranty for extended warranty items, to include roofs, HVAC balancing, pumps, motors, transformers and for all commissioned systems such as fire protection and alarm systems, sprinkler systems and lightning protection systems, etc.
  4. A list for each warranted equipment item, feature of construction or system indicating:
    - a. Name of item.
    - b. Model and serial numbers.
    - c. Location where installed.
    - d. Name and phone numbers of manufacturers and suppliers.
    - e. Name and phone numbers of manufacturers or suppliers.
    - f. Names, addresses and phone numbers of sources of spare parts.
    - g. Warranties and terms of warranty. Include one-year overall warranty of construction, including the starting date of warranty of construction. Items which have extended warranties must be indicated with separate warranty expiration dates.
    - h. Starting point and duration of warranty period.
    - i. Summary of maintenance procedures required to continue the warranty in force.
    - j. Cross-reference to specific pertinent Operation and Maintenance manuals.
    - k. Organizations, names and phone numbers of persons to call for warranty service.
    - l. Typical response time and repair time expected for various warranted equipment.
  5. The plans for attendance at the 4 and 9-month post construction warranty inspections conducted by the government.
  6. Procedure and status of tagging of all equipment covered by extended warranties.
  7. Copies of instructions to be posted near selected pieces of equipment where operation is critical for warranty and/or safety reasons.
- B. Performance Bond: The Performance Bond must remain effective throughout the construction period.
1. In the event the Contractor fails to commence and diligently pursue any construction warranty work required, the Contracting Officer will have the work performed by others, and after completion of the work, will charge the remaining construction warranty funds of expenses incurred by the Government while performing the work, including, but not limited to administrative expenses.
  2. In the event sufficient funds are not available to cover the construction warranty work performed by the Government at the contractor's expenses, the Contracting Officer will have the right to recoup expenses from the bonding company.
  3. Following oral or written notification of required construction warranty repair work, the Contractor shall respond in a timely manner. Written verification will follow oral

instructions. Failure to respond will be cause for the Contracting Officer to proceed against the Contractor.

- C. Pre-Warranty Conference: Prior to contract completion, and at a time designated by the Contracting Officer, the Contractor shall meet with the Contracting Officer to develop a mutual understanding with respect to the requirements of this section. Communication procedures for Contractor notification of construction warranty defects, priorities with respect to the type of defect, reasonable time required for Contractor response, and other details deemed necessary by the Contracting Officer for the execution of the construction warranty will be established/ reviewed at this meeting. In connection with these requirements and at the time of the Contractor's quality control completion inspection, furnish the name, telephone number and address of a licensed and bonded company which is authorized to initiate and pursue construction warranty work action on behalf of the Contractor. This point of contract will be located within the local service area of the warranted construction, be continuously available and be responsive to Government inquiry on warranty work action and status. This requirement does not relieve the Contractor of any of its responsibilities in conjunction with other portions of this provision.
- D. Contractor's Response to Construction Warranty Service Requirements:
1. Following oral or written notification by the Contracting Officer, the Contractor shall respond to construction warranty service requirements in accordance with the "Construction Warranty Service Priority List" and the three categories of priorities listed below. Submit a report on any warranty item that has been repaired during the warranty period. Include within the report the cause of the problem, date reported, corrective action taken, and when the repair was completed. If the Contractor does not perform the construction warranty within the timeframe specified, the Government will perform the work and back charge the construction warranty payment item established.
    - a. First Priority Code 1. Perform onsite inspection to evaluate situation, and determine course of action within 4 hours, initiate work within 6 hours and work continuously to completion or relief.
    - b. Second Priority Code 2. Perform onsite inspection to evaluate situation, and determine course of action within 8 hours, initiate work within 24 hours and work continuously to completion or relief.
    - c. Third Priority Code 3. All other work to be initiated within 3 work days and work continuously to completion or relief.
    - d. The "Construction Warranty Service Priority List" is as follows:
      - 1) Code 1-Life Safety Systems
        - a) Fire suppression systems.
        - b) Fire alarm system(s).
      - 2) Code 1-Air Conditioning Systems
        - a) Air conditioning leak in part of the building, if causing damage.
        - b) Air conditioning system not cooling properly.
      - 3) Code 1 Doors
        - a) Overhead doors not operational, causing a security, fire or safety problem.
        - b) Interior, exterior personnel doors or hardware, not functioning properly, causing security, fire or safety problem.
      - 4) Code 3-Doors
        - a) Overhead doors not operational.
        - b) Interior/exterior personnel doors or hardware not functioning properly.
      - 5) Code 1-Electrical
        - a) Power failure (entire area or any building operational after 1600 hours).
        - b) Security lights.
        - c) Smoke detectors.
      - 6) Code 2-Electrical

- a) Power failure (no power to a room or part of building).
  - b) Receptacles and lights not operational (in a room or part of building).
  - 7) Code 3-Electrical
    - a) Exterior lights not operational.
  - 8) Code 1-Gas
    - a) Leaks and pipeline breaks.
  - 9) Code 1-Heat
    - a) Power failure affecting heat.
  - 10) Code 1-Plumbing
    - a) Hot water heater failure.
    - b) Leaking water supply pipes.
  - 11) Code 2-Plumbing
    - a) Flush valves not operating properly
    - b) Fixture drain, supply line or any water pipe leaking.
    - c) Toilet leaking at base.
  - 12) Code 3- Plumbing
    - a) Leaky faucets.
    - b) Code 3-Interior
    - c) Floors damaged.
    - d) Paint chipping or peeling.
    - e) Casework damaged.
  - 13) Code 1-Roof Leaks
    - a) Damage to property is occurring.
  - 14) Code 2-Water (Exterior)
    - a) No water to facility.
  - 15) Code 2-Water (Hot)
    - a) No hot water in portion of building listed.
  - 16) Code 3
    - a) All work not listed above.
- E. Warranty Tags: At the time of installation, tag each warranted item with a durable, oil and water-resistant tag approved by the Contracting Officer. Attach each tag with a copper wire and spray with a silicone waterproof coating. Also submit two record copies of the warranty tags showing the layout and design. The date of acceptance and the QC signature must remain blank until the project is accepted for beneficial occupancy. Show the following information on the tag.

Type of product/material	
Model number	
Serial number	
Contract number	
Warranty period from/to	
Inspector's signature	
Construction Contractor	
Address	
Telephone number	
Warranty contact	
Address	
Telephone number	
Warranty response time priority code	

F.

**1.16 USE OF ROADWAYS**

- A. For hauling, use only established public roads and roads on Medical Center property and, when authorized by the COR, such temporary roads which are necessary in the performance of contract work. Temporary roads shall be constructed and restoration performed 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.

**1.17 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 written approval and compliance with the following provisions:
  - 1. Permission to use each unit or system must be given by COR in writing. If the equipment is not installed and maintained in accordance with the written agreement and following provisions, the COR 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. Installation of temporary electrical equipment or devices shall be in accordance with NFPA 70, National Electrical Code, (2020 Edition), Article 590, *Temporary Installations*.

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.
- B. Prior to final inspection, the equipment or parts used which 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.

#### **1.18 TEMPORARY TOILETS**

- A. Provide where directed, (for use of all Contractor's workers) ample temporary sanitary toilet accommodations with suitable sewer and water connections; or, when approved by COR, 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.
- B. Contractor may have for use of Contractor's workers, such toilet accommodations as may be assigned to Contractor by Medical Center. Contractor shall keep such places clean and be responsible for any damage done thereto by Contractor's workers. Failure to maintain satisfactory condition in toilets will deprive Contractor of the privilege to use such toilets.

#### **1.19 AVAILABILITY AND USE OF UTILITY SERVICES**

- A. The Government shall make all reasonably required amounts of utilities available to the Contractor from existing outlets and supplies, as specified in the contract. The amount to be paid by the Contractor for chargeable electrical services shall be the prevailing rates charged to the Government. The Contractor shall carefully conserve any utilities furnished without charge.
- B. The Contractor, at Contractor's expense and in a workmanlike manner, in compliance with code and as 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 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 and repair restore the infrastructure as required.
- C. Contractor shall install meters at Contractor's expense and furnish the Medical Center a monthly record of the Contractor's usage of electricity 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:
1. Obtain heat by connecting to Medical Center heating distribution system.
    - a. Steam is available at no cost to Contractor.

- E. Electricity (for Construction and Testing): Furnish all temporary electric services.
  - 1. Obtain electricity by connecting to the Medical Center electrical distribution system. The Contractor shall meter and pay for electricity required for electric cranes and hoisting devices, electrical welding devices and any electrical heating devices providing temporary heat. Electricity for all other uses is available at no cost to the Contractor.
- F. Water (for Construction and Testing): Furnish temporary water service.
  - 1. Obtain water by connecting to the Medical Center water distribution system. Provide reduced pressure backflow preventer at each connection as per code. Water is available at no cost to the Contractor.
  - 2. Maintain connections, pipe, fittings and fixtures and conserve water-use so none is wasted. Failure to stop leakage or other wastes will be cause for revocation at COR discretion) of use of water from Medical Center's system.

#### **1.20 NEW TELEPHONE EQUIPMENT**

- A. The contractor shall coordinate with the work of installation of telephone equipment by others. This work shall be completed before the building is turned over to VA.

#### **1.21 TESTS AND INSPECTIONS**

- A. All testing shall be by certified testing laboratories subcontracted by the General Contractor per Section 01 45 29, TESTING LABORATORY SERVICES.
  - 1. The Government shall not be required to contract testing for any trade.
- B. Inspections:
  - 1. The Government does not provide courtesy, pre-inspections of construction area and systems during the construction. The Contractor shall request progress inspections and communicate requests for inspections at least one week in advance.
  - 2. Comprehensive 3rd party inspections, testing and written reports for all Divisions (paid by the General Contractor).
    - a. Contractor shall employ third party inspection consultants to perform all inspections required by this contract. The VA has no inspection capability. Any reference to VA inspections shall be by a third-party inspector qualified to perform the work. Credentials shall be supplied to the VA/AE as required by this contract. All inspections, testing, certifications, and permits are to be paid for by the General Contractor. The VA will not pay for or perform any required inspections. VA inspections are for VA use only, when performed, and do not reduce the inspection burden on the Contractor for conformance to the Contract Documents. Third-party inspection services must be submitted for acceptance by the VA after award. Submission to include resumes of inspectors, with alternates, projected days on site, qualifications of inspectors showing similar projects, related portfolio, and description of communication protocol with Owner.
    - b. Contractor shall notify VA COR minimum (7) days in advance of each third-party inspection to allow coordination with VA personnel.
    - c. Third-Party Inspectors shall have minimum qualifications as detailed in "01 45 00 Quality Control CQC Part 3.2 Personnel Experience Matrix".
    - d. Acceptable Third-Party inspectors include the following examples:
      - 1) Parsons Brinckerhoff
        - a) <http://www.wsp-pb.com/en/WSP-USA/What-we-do-USA/Services/All-Services-A-Z/Bridge-Engineering/Construction-Inspection/>
      - 2) Booz Allen
        - a) <http://www.boozallen.com>
      - 3) US Army Corps of Engineers
        - a) <http://www.usace.army.mil/>
      - 4) Bureau Veritas
        - a) <http://www.bureauveritas.com/>
      - 5) Stantec

- a) <http://www.stantec.com/our-work/services/construction-qa-qc-monitoring-inspection-services.html>
  - 6) HDR, Inc.
    - a) <http://www.hdrinc.com/>
  - 7) Gilbane
    - a) <http://www.gilbaneco.com>.
  - e. Minimum inspections required:
    - 1) Structural.
    - 2) Mechanical.
    - 3) Electrical.
    - 4) Plumbing.
    - 5) Fire Protection.
    - 6) Low Voltage Systems.
    - 7) Communications and Security Systems.
    - 8) Controls System Integration.
    - 9) Commissioning Support.
    - 10) Framing, Interior Finishes and Doors/Hardware.
  - 3. Special Inspections per Section 01 45 35, SPECIAL INSPECTIONS.
  - 4. All third-party, Special Inspections Reports shall be recorded and submitted before Commissioning Systems Functional Performance Test start.
- C. System Testing Requirements:
- 1. As per specification section 23 05 93 the contractor shall provide a written testing and commissioning plan complete with component level, equipment level, sub-system level and system level breakdowns. The plan will provide a schedule and a written sequence of what will be tested, how and what the expected outcome will be. This document will be submitted for approval prior to commencing work. The contractor shall document the results of the approved plan and submit for approval with the as built documentation.
  - 2. 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.
  - 3. 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.
  - 4. Mechanical and electrical systems shall be balanced, controlled and coordinated. A system is defined as the entire system which must be coordinated to work together during normal operation to produce results for which the system is designed. For example, air conditioning supply air is only one part of entire system which provides comfort conditions for a building. Other related components are return air, exhaust air, steam, chilled water, refrigerant, hot water, controls and electricity, etc. Another example of a system which involves several components of different disciplines is a boiler installation. Efficient and acceptable boiler operation depends upon the coordination and proper operation of fuel, combustion air, controls, steam, feedwater, condensate and other related components.
  - 5. All related components as defined above shall be functioning when any system component is tested. Tests shall be completed within a reasonable period of time during which operating and environmental conditions remain reasonably constant and are typical of the design conditions.
  - 6. Individual test result of any component, where required, will only be accepted when submitted with the test results of related components and of the entire system.

## 1.22 INSTRUCTIONS

- A. Contractor shall furnish Maintenance and Operating manuals (hard copies and electronic) and verbal instructions when required by the various sections of the specifications and as hereinafter specified.

- B. Manuals: Maintenance and operating manuals and one compact disc (four hard copies and one electronic copy each) for each separate piece of equipment shall be delivered to the COR 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 training 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 COR and shall be considered concluded only when the COR is satisfied in regard to complete and thorough coverage. The contractor shall submit a course outline with associated material to the COR for review and approval prior to scheduling training to ensure the subject matter covers the expectations of the VA and the contractual requirements. The Department of Veterans Affairs reserves the right to request the removal of, and substitution for, any instructor who, in the opinion of the COR, does not demonstrate sufficient qualifications in accordance with requirements for instructors above.

### **1.23 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. Storage space for equipment will be provided by the Government and the Contractor shall be prepared to unload and store such equipment therein upon its receipt at the Medical Center.
- E. 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.
- F. 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.

- G. Completely assemble and install the Government furnished equipment in place ready for proper operation in accordance with specifications and drawings.
- H. Furnish supervision of installation of equipment at construction site by qualified factory trained technicians regularly employed by the equipment manufacturer.

#### **1.24 RELOCATED EQUIPMENT AND ITEMS**

- A. Contractor shall disconnect, dismantle as necessary, remove and reinstall in new location, all existing equipment and items indicated by symbol "R" or otherwise shown to be relocated by the Contractor.
- B. Perform relocation of such equipment or items at such times and in such a manner as directed by the COR.
- C. Suitably cap existing service lines, such as steam, condensate return, water, drain, gas, air, vacuum and/or electrical, at the main whenever such lines are disconnected from equipment to be relocated. Remove abandoned lines in finished areas and cap as specified herein before under paragraph "Abandoned Lines".
- D. Provide all mechanical and electrical service connections, fittings, fastenings and any other materials necessary for assembly and installation of relocated equipment; and leave such equipment in proper operating condition.
- E. All service lines such as noted above for relocated equipment shall be in place at point of relocation ready for use before any existing equipment is disconnected. Make relocated existing equipment ready for operation or use immediately after reinstallation.

#### **1.25 CONSTRUCTION SIGN**

- A. Provide a Construction Sign where directed by the COR. All wood members shall be of framing lumber. Cover sign frame with 0.7 mm (24 gage) galvanized sheet steel nailed securely around edges and on all bearings. Provide three 100 by 100 mm (4 inch by 4 inch) posts (or equivalent round posts) set 1200 mm (four feet) into ground. Set bottom of sign level at 900 mm (three feet) above ground and secure to posts with through bolts. Make posts full height of sign. Brace posts with 50 x 100 mm (two by four inch) material as directed.
- B. Paint all surfaces of sign and posts two coats of white gloss paint. Border and letters shall be of black gloss paint, except project title which shall be blue gloss paint.
- C. Maintain sign and remove it when directed by the COR.
- D. Detail Drawing of construction sign showing required legend and other characteristics of sign is shown on the drawings.

#### **1.26 SAFETY SIGN**

- A. Provide a Safety Sign where directed by COR. Face of sign shall be 19 mm (3/4 inch) thick exterior grade plywood. Provide two 100 mm by 100 mm (four by four inch) posts extending full height of sign and 900 mm (three feet) into ground. Set bottom of sign level at 1200 mm (four feet) above ground.
- B. Paint all surfaces of Safety Sign and posts with one prime coat and two coats of white gloss paint. Letters and design shall be painted with gloss paint of colors noted.
- C. Maintain sign and remove it when directed by COR.
- D. Standard Detail Drawing Number SD10000-02(Found on VA TIL) of safety sign showing required legend and other characteristics of sign is shown on the drawings.

E. Post the number of accident free days on a daily basis.


**1.27 PHOTOGRAPHIC DOCUMENTATION**

- A. During the construction period through completion, provide photographic documentation of construction progress and at selected milestones including electronic indexing, navigation, storage and remote access to the documentation, as per these specifications. The commercial photographer or the subcontractor used for this work shall meet the following qualifications:
  - 1. Demonstrable minimum experience of three (3) years in operation providing documentation and advanced indexing/navigation systems including a representative portfolio of construction projects of similar type, size, duration and complexity as the Project.
  - 2. Demonstrable ability to service projects throughout North America, which shall be demonstrated by a representative portfolio of active projects of similar type, size, duration and complexity as the Project.
  
- B. Photographic documentation elements:
  - 1. Each digital image shall be taken with a professional grade camera with minimum size of 6 megapixels (MP) capable of producing 200x250mm (8 x 10 inch) prints with a minimum of 2272 x 1704 pixels and 400x500mm (16 x 20 inch) prints with a minimum 2592 x 1944 pixels.
  - 2. Indexing and navigation system shall utilize actual AUTOCAD construction drawings, making such drawings interactive on an on-line interface. For all documentation referenced herein, indexing and navigation must be organized by both time (date-stamped) and location throughout the project.
  - 3. Documentation shall combine indexing and navigation system with inspection-grade digital photography designed to capture actual conditions throughout construction and at critical milestones. Documentation shall be accessible on-line through use of an internet connection. Documentation shall allow for secure multiple-user access, simultaneously, on-line.
  - 4. 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 documented. Overlapping photographic techniques shall be used to ensure maximum coverage. Indexing and navigation accomplished through

interactive architectural drawings. If site work or pad preparation is extensive, this documentation may be required immediately before construction and at several pre-determined intervals before building work commences.

5. Construction progress for all trades shall be tracked at pre-determined 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.
6. 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. Overlapping photographic techniques shall be used to ensure maximum coverage. Indexing and navigation accomplished through interactive site utility plans.
7. As-built conditions of mechanical, electrical, plumbing and all other systems shall be documented 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. Overlapping photographic techniques shall be used to ensure maximum coverage. Indexing and navigation accomplished through interactive architectural drawings.
8. As-built conditions of exterior skin and elevations shall be documented with an increased concentration of digital photographs as directed by the COR 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 ensure maximum coverage. Indexing and navigation accomplished through interactive elevations or elevation details.
9. 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 COR. Overlapping photographic techniques shall be used to ensure maximum coverage. Indexing and navigation accomplished through interactive architectural drawings.
10. 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 Section in the navigation structure entitled "Slideshows," allowing this information to be stored in the same "place" as the formal scope.
11. Customizable project-specific digital photographic documentation of other details or milestones. Indexing and navigation accomplished through interactive architectural plans.
12. Monthly (29 max) exterior progressions (360 degrees around the project) and slideshows (all elevations and building envelope). The slideshows allow for the inclusion of Department of Veterans Affairs pictures, aerial photographs, and timely images which do not fit into any regular monthly photopath.
13. Weekly (21 Max) Site Progressions - Photographic 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.
14. Regular (8 max) interior progressions of all walls of the entire project to begin at time of substantial framed or as directed by the COR through to completion.
15. Detailed Exact-Built of all Slabs for all project slab pours just prior to placing concrete or as directed by the COR.
16. Detailed Interior exact built overlapping photos of the entire building to include documentation of all mechanical, electrical and plumbing systems in every wall and ceiling, to be conducted after rough-ins are complete, just prior to insulation and or drywall, or as directed by COR.

#### General Requirements

17. Finished detailed Interior exact built overlapping photos of all walls, ceilings, and floors to be scheduled by COR prior to occupancy.
  18. In event a greater or lesser number of images than specified above are required by the COR, adjustment in contract price will be made in accordance with clause entitled "CHANGES" (FAR 52.243-4).
- C. 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.
  - D. Coordination of photo shoots is accomplished through COR . Contractor shall also attend construction team meetings as necessary. Contractor's operations team shall provide regular updates regarding the status of the documentation, including photo shoots concluded, the availability of new Progressions or Exact-Built viewable on-line 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. 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.

#### **1.28 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 COR 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. Pictures shall be 400 mm x 500 mm (16 by 20 inches), printed on regular weight paper, matte finish archival grade photographic paper and produced by a RA4 process from the digital image with a minimum 300 PPI. Identifying data shall be carried on label affixed to back of photograph without damage to photograph and shall be similar to that provided for final construction photographs.
- C. Furnish six (6) 400 mm x 500 mm (16 by 20 inch) color prints of the following buildings constructed under this project (elevations as selected by the RE from the images taken above). Photographs shall be artistically composed showing full front elevations. All images shall become property of the Government. Each of the selected six prints shall be place in a frame with a minimum of 2 inches of appropriate matting as a border. Provide a selection of a minimum of 3 different frames from which the COR will select one style to frame all six prints. Photographs with frames shall be delivered to the COR in boxes suitable for shipping.
  1. Community Living Center Building No. CLC.

#### **1.29 HISTORIC PRESERVATION**

- A. 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 COR verbally, and then with a written follow up.

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## **SECTION 01 32 16.15**

### **PROJECT SCHEDULES**

#### **(SMALL PROJECTS – DESIGN/BID/BUILD)**

#### **PART 1 - GENERAL**

##### **1.1 DESCRIPTION:**

- A. The Contractor shall develop a Critical Path Method (CPM) plan and schedule demonstrating fulfillment of the contract requirements (Project Schedule), and shall keep the Project Schedule up-to-date in accordance with the requirements of this section and shall utilize the plan for scheduling, coordinating and monitoring work under this contract (including all activities of subcontractors, equipment vendors and suppliers). Conventional Critical Path Method (CPM) technique shall be utilized to satisfy both time and cost applications.

##### **1.2 CONTRACTOR'S REPRESENTATIVE:**

- A. The Contractor shall designate an authorized representative responsible for the Project Schedule including preparation, review and progress reporting with and to the Contracting Officer's Representative (COR).
- B. The Contractor's representative shall have direct project control and complete authority to act on behalf of the Contractor in fulfilling the requirements of this specification section.
- C. The Contractor's representative shall have the option of developing the project schedule within their organization or to engage the services of an outside consultant. If an outside scheduling consultant is utilized, Section 1.3 of this specification will apply.

##### **1.3 CONTRACTOR'S CONSULTANT:**

- A. The Contractor shall submit a qualification proposal to the COR, within 10 days of bid acceptance. The qualification proposal shall include:
  - 1. The name and address of the proposed consultant.
  - 2. Information to show that the proposed consultant has the qualifications to meet the requirements specified in the preceding paragraph.
  - 3. A representative sample of prior construction projects, which the proposed consultant has performed complete project scheduling services. These representative samples shall be of similar size and scope.
- B. The Contracting Officer has the right to approve or disapprove the proposed consultant, and will notify the Contractor of the VA decision within seven calendar days from receipt of the qualification proposal. In case of disapproval, the Contractor shall resubmit another consultant within 10 calendar days for renewed consideration. The Contractor shall have their scheduling consultant approved prior to submitting any schedule for approval.

##### **1.4 COMPUTER PRODUCED SCHEDULES**

- A. The contractor shall provide monthly, to the Department of Veterans Affairs (VA), all computer-produced time/cost schedules and reports generated from monthly project updates. This monthly computer service will include: three copies of up to five different reports (inclusive of all pages) available within the user defined reports of the scheduling software approved by the Contracting Officer; a hard copy listing of all project schedule changes, and associated data, made at the update and an electronic file of this data; and the resulting monthly updated schedule in PDM format. These must be submitted with and substantively support the contractor's monthly payment request and the signed look ahead report. The COR shall identify the five different report formats that the contractor shall provide.

Project Schedules (Small Projects - Design-Bid-Build)

- B. The contractor shall be responsible for the correctness and timeliness of the computer-produced reports. The Contractor shall also responsible for the accurate and timely submittal of the updated project schedule and all CPM data necessary to produce the computer reports and payment request that is specified.
- C. The VA will report errors in computer-produced reports to the Contractor's representative within ten calendar days from receipt of reports. The Contractor shall reprocess the computer-produced reports and associated diskette(s), when requested by the Contracting Officer's representative, to correct errors which affect the payment and schedule for the project.

#### 1.5 THE COMPLETE PROJECT SCHEDULE SUBMITTAL

- A. Within 45 calendar days after receipt of Notice to Proceed, the Contractor shall submit for the Contracting Officer's review; three blue line copies of the interim schedule on sheets of paper 765 x 1070 mm (30 x 42 inches) and an electronic file in the previously approved CPM schedule program. The submittal shall also include three copies of a computer-produced activity/event ID schedule showing project duration; phase completion dates; and other data, including event cost. Each activity/event on the computer-produced schedule shall contain as a minimum, but not limited to, activity/event ID, activity/event description, duration, budget amount, early start date, early finish date, late start date, late finish date and total float. Work activity/event relationships shall be restricted to finish-to-start or start-to-start without lead or lag constraints. Activity/event date constraints, not required by the contract, will not be accepted unless submitted to and approved by the Contracting Officer. The contractor shall make a separate written detailed request to the Contracting Officer identifying these date constraints and secure the Contracting Officer's written approval before incorporating them into the network diagram. The Contracting Officer's separate approval of the Project Schedule shall not excuse the contractor of this requirement. Logic events (non-work) will be permitted where necessary to reflect proper logic among work events, but must have zero duration. The complete working schedule shall reflect the Contractor's approach to scheduling the complete project. **The final Project Schedule in its original form shall contain no contract changes or delays which may have been incurred during the final network diagram development period and shall reflect the entire contract duration as defined in the bid documents.** These changes/delays shall be entered at the first update after the final Project Schedule has been approved. The Contractor should provide their requests for time and supporting time extension analysis for contract time as a result of contract changes/delays, after this update, and in accordance with Article, ADJUSTMENT OF CONTRACT COMPLETION.
- B. Within 30 calendar days after receipt of the complete project interim Project Schedule and the complete final Project Schedule, the Contracting Officer or his representative, will do one or both of the following:
  - 1. Notify the Contractor concerning his actions, opinions, and objections.
  - 2. A meeting with the Contractor at or near the job site for joint review, correction or adjustment of the proposed plan will be scheduled if required. Within 14 calendar days after the joint review, the Contractor shall revise and shall submit three blue line copies of the revised Project Schedule, three copies of the revised computer-produced activity/event ID schedule and a revised electronic file as specified by the Contracting Officer. The revised submission will be reviewed by the Contracting Officer and, if found to be as previously agreed upon, will be approved.
- C. The approved baseline schedule and the computer-produced schedule(s) generated there from shall constitute the approved baseline schedule until subsequently revised in accordance with the requirements of this section.
- D. The Complete Project Schedule shall contain one work activities/events.

#### 1.6 WORK ACTIVITY/EVENT COST DATA

- A. The Contractor shall cost load all work activities/events except procurement activities. The cumulative amount of all cost loaded work activities/events (including alternates) shall equal the

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total contract price. Prorate overhead, profit and general conditions on all work activities/events for the entire project length. The contractor shall generate from this information cash flow curves indicating graphically the total percentage of work activity/event dollar value scheduled to be in place on early finish, late finish. These cash flow curves will be used by the Contracting Officer to assist him in determining approval or disapproval of the cost loading. Negative work activity/event cost data will not be acceptable, except on VA issued contract changes.

- B. The Contractor shall cost load work activities/events for guarantee period services, test, balance and adjust various systems in accordance with the provisions in Article, FAR 52.232 – 5 (PAYMENT UNDER FIXED-PRICE CONSTRUCTION CONTRACTS) and VAAR 852.232 – Article 70 Without NAS-CPM for (PAYMENTS UNDER FIXED PRICE CONSTRUCTION).
- C. In accordance with FAR 52.236 – 1 (PERFORMANCE OF WORK BY THE CONTRACTOR) and VAAR 852.236 – 72 (PERFORMANCE OF WORK BY THE CONTRACTOR), the Contractor shall submit, simultaneously with the cost per work activity/event of the construction schedule required by this Section, a responsibility code for all activities/events of the project for which the Contractor's forces will perform the work.
- D. The Contractor shall cost load work activities/events for all BID ITEMS including ASBESTOS ABATEMENT. The sum of each BID ITEM work shall equal the value of the bid item in the Contractors' bid.

#### **1.7 PROJECT SCHEDULE REQUIREMENTS**

- A. Show on the project schedule the sequence of work activities/events required for complete performance of all items of work. The Contractor Shall:
  - 1. Show activities/events as:
    - a. Contractor's time required for submittal of shop drawings, templates, fabrication, delivery and similar pre-construction work.
    - b. Contracting Officer's and Architect-Engineer's review and approval of shop drawings, equipment schedules, samples, template, or similar items.
    - c. Interruption of VA Facilities utilities, delivery of Government furnished equipment, and rough-in drawings, project phasing and any other specification requirements.
    - d. Test, balance and adjust various systems and pieces of equipment, maintenance and operation manuals, instructions and preventive maintenance tasks.
    - e. VA inspection and acceptance activity/event with a minimum duration of five workdays at the end of each phase and immediately preceding any VA move activity/event required by the contract phasing for that phase.
  - 2. Show not only the activities/events for actual construction work for each trade category of the project, but also trade relationships to indicate the movement of trades from one area, floor, or building, to another area, floor, or building, for at least five trades who are performing major work under this contract.
  - 3. Break up the work into activities/events of a duration no longer than 20 work days each or one reporting period, except as to non-construction activities/events (i.e., procurement of materials, delivery of equipment, concrete and asphalt curing) and any other activities/events for which the COR may approve the showing of a longer duration. The duration for VA approval of any required submittal, shop drawing, or other submittals will not be less than 21 workdays.
  - 4. Describe work activities/events clearly, so the work is readily identifiable for assessment of completion. Activities/events labeled "start," "continue," or "completion," are not specific and will not be allowed. Lead and lag time activities will not be acceptable.
  - 5. The schedule shall be generally numbered in such a way to reflect either discipline, phase or location of the work.
- B. The Contractor shall submit the following supporting data in addition to the project schedule:
  - 1. The appropriate project calendar including working days and holidays.
  - 2. The planned number of shifts per day.
  - 3. The number of hours per shift.

- C. Failure of the Contractor to include this data shall delay the review of the submittal until the Contracting Officer is in receipt of the missing data.
- D. To the extent that the Project Schedule or any revised Project Schedule shows anything not jointly agreed upon, it shall not be deemed to have been approved by the COR. Failure to include any element of work required for the performance of this contract shall not excuse the Contractor from completing all work required within any applicable completion date of each phase regardless of the COR's approval of the Project Schedule.
- E. Compact Disk Requirements and CPM Activity/Event Record Specifications: Submit to the VA an electronic file(s) containing one file of the data required to produce a schedule, reflecting all the activities/events of the complete project schedule being submitted.

**1.8 PAYMENT TO THE CONTRACTOR:**

- A. Monthly, the contractor shall submit an application and certificate for payment using VA Form 10-6001a or the AIA application and certificate for payment documents G702 & G703 reflecting updated schedule activities and cost data in accordance with the provisions of the following Article, PAYMENT AND PROGRESS REPORTING, as the basis upon which progress payments will be made pursuant to Article, FAR 52.232 – 5 (PAYMENT UNDER FIXED-PRICE CONSTRUCTION CONTRACTS) and VAAR 852.232 –Article 70 Without NAS-CPM for (PAYMENTS UNDER FIXED PRICE CONSTRUCTION). The Contractor shall be entitled to a monthly progress payment upon approval of estimates as determined from the currently approved updated project schedule. Monthly payment requests shall include: a listing of all agreed upon project schedule changes and associated data; and an electronic file (s) of the resulting monthly updated schedule.
- B. Approval of the Contractor's monthly Application for Payment shall be contingent, among other factors, on the submittal of a satisfactory monthly update of the project schedule.

**1.9 PAYMENT AND PROGRESS REPORTING**

- A. Monthly schedule update meetings will be held on dates mutually agreed to by the COR and the Contractor. Contractor and their CPM consultant (if applicable) shall attend all monthly schedule update meetings. The Contractor shall accurately update the Project Schedule and all other data required and provide this information to the COR three workdays in advance of the schedule update meeting. Job progress will be reviewed to verify:
  - 1. Actual start and/or finish dates for updated/completed activities/events.
  - 2. Remaining duration for each activity/event started, or scheduled to start, but not completed.
  - 3. Logic, time and cost data for change orders, and supplemental agreements that are to be incorporated into the Project Schedule.
  - 4. Changes in activity/event sequence and/or duration which have been made, pursuant to the provisions of following Article, ADJUSTMENT OF CONTRACT COMPLETION.
  - 5. Completion percentage for all completed and partially completed activities/events.
  - 6. Logic and duration revisions required by this section of the specifications.
  - 7. Activity/event duration and percent complete shall be updated independently.
- B. After completion of the joint review, the contractor shall generate an updated computer-produced calendar-dated schedule and supply the Contracting Officer's representative with reports in accordance with the Article, COMPUTER PRODUCED SCHEDULES, specified.
- C. After completing the monthly schedule update, the contractor's representative or scheduling consultant shall rerun all current period contract change(s) against the prior approved monthly project schedule. The analysis shall only include original workday durations and schedule logic agreed upon by the contractor and resident engineer for the contract change(s). When there is a disagreement on logic and/or durations, the Contractor shall use the schedule logic and/or durations provided and approved by the resident engineer. After each rerun update, the resulting electronic project schedule data file shall be appropriately identified and submitted to

the VA in accordance to the requirements listed in articles 1.4 and 1.7. This electronic submission is separate from the regular monthly project schedule update requirements and shall be submitted to the resident engineer within fourteen (14) calendar days of completing the regular schedule update. **Before inserting the contract changes durations, care must be taken to ensure that only the original durations will be used for the analysis, not the reported durations after progress. In addition, once the final network diagram is approved, the contractor must recreate all manual progress payment updates on this approved network diagram and associated reruns for contract changes in each of these update periods as outlined above for regular update periods. This will require detailed record keeping for each of the manual progress payment updates.**

- D. Following approval of the CPM schedule, the VA, the General Contractor, its approved CPM Consultant, RE office representatives, and all subcontractors needed, as determined by the SRE, shall meet to discuss the monthly updated schedule. The main emphasis shall be to address work activities to avoid slippage of project schedule and to identify any necessary actions required to maintain project schedule during the reporting period. The Government representatives and the Contractor should conclude the meeting with a clear understanding of those work and administrative actions necessary to maintain project schedule status during the reporting period. This schedule coordination meeting will occur after each monthly project schedule update meeting utilizing the resulting schedule reports from that schedule update. If the project is behind schedule, discussions should include ways to prevent further slippage as well as ways to improve the project schedule status, when appropriate.

#### 1.10 RESPONSIBILITY FOR COMPLETION

- A. If it becomes apparent from the current revised monthly progress schedule that phasing or contract completion dates will not be met, the Contractor shall execute some or all of the following remedial actions:
  - 1. Increase construction manpower in such quantities and crafts as necessary to eliminate the backlog of work.
  - 2. Increase the number of working hours per shift, shifts per working day, working days per week, the amount of construction equipment, or any combination of the foregoing to eliminate the backlog of work.
  - 3. Reschedule the work in conformance with the specification requirements.
- B. Prior to proceeding with any of the above actions, the Contractor shall notify and obtain approval from the COR for the proposed schedule changes. If such actions are approved, the representative schedule revisions shall be incorporated by the Contractor into the Project Schedule before the next update, at no additional cost to the Government.

#### 1.11 CHANGES TO THE SCHEDULE

- A. Within 30 calendar days after VA acceptance and approval of any updated project schedule, the Contractor shall submit a revised electronic file (s) and a list of any activity/event changes including predecessors and successors for any of the following reasons:
  - 1. Delay in completion of any activity/event or group of activities/events, which may be involved with contract changes, strikes, unusual weather, and other delays will not relieve the Contractor from the requirements specified unless the conditions are shown on the CPM as the direct cause for delaying the project beyond the acceptable limits.
  - 2. Delays in submittals, or deliveries, or work stoppage are encountered which make rescheduling of the work necessary.
  - 3. The schedule does not represent the actual prosecution and progress of the project.
  - 4. When there is, or has been, a substantial revision to the activity/event costs regardless of the cause for these revisions.
- B. CPM revisions made under this paragraph which affect the previously approved computer-produced schedules for Government furnished equipment, vacating of areas by the VA Facility, contract phase(s) and sub phase(s), utilities furnished by the Government to the

Contractor, or any other previously contracted item, shall be furnished in writing to the Contracting Officer for approval.

- C. Contracting Officer's approval for the revised project schedule and all relevant data is contingent upon compliance with all other paragraphs of this section and any other previous agreements by the Contracting Officer or the VA representative.
- D. The cost of revisions to the project schedule resulting from contract changes will be included in the proposal for changes in work as specified in FAR 52.243 – 4 (Changes,), and will be based on the complexity of the revision or contract change, man hours expended in analyzing the change, and the total cost of the change.
- E. The cost of revisions to the Project Schedule not resulting from contract changes is the responsibility of the Contractor.

#### **1.12 ADJUSTMENT OF CONTRACT COMPLETION**

- A. The contract completion time will be adjusted only for causes specified in this contract. Request for an extension of the contract completion date by the Contractor shall be supported with a justification, CPM data and supporting evidence as the COR may deem necessary for determination as to whether or not the Contractor is entitled to an extension of time under the provisions of the contract. Submission of proof based on revised activity/event logic, durations (in workdays) and costs is obligatory to any approvals. The schedule must clearly display that the Contractor has used, in full, all the float time available for the work involved in this request. The Contracting Officer's determination as to the total number of days of contract extension will be based upon the current computer-produced calendar-dated schedule for the time period in question and all other relevant information.
- B. Actual delays in activities/events which, according to the computer- produced calendar-dated schedule, do not affect the extended and predicted contract completion dates shown by the critical path in the network, will not be the basis for a change to the contract completion date. The Contracting Officer will within a reasonable time after receipt of such justification and supporting evidence, review the facts and advise the Contractor in writing of the Contracting Officer's decision.
- C. The Contractor shall submit each request for a change in the contract completion date to the Contracting Officer in accordance with the provisions specified under FAR 52.243 – 4 (Changes). The Contractor shall include, as a part of each change order proposal, a sketch showing all CPM logic revisions, duration (in workdays) changes, and cost changes, for work in question and its relationship to other activities on the approved network diagram.
- D. All delays due to non-work activities/events such as RFI's, WEATHER, STRIKES, and similar non-work activities/events shall be analyzed on a month by month basis.

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## SECTION 01 33 23

### SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. This specification defines the general requirements and procedures for submittals. A submittal is information submitted for VA review to establish compliance with the contract documents.
- B. Detailed submittal requirements are found in the technical sections of the contract specifications. The Contracting Officer may request submittals in addition to those specified when deemed necessary to adequately describe the work covered in the respective technical specifications at no additional cost to the government.
- C. VA approval of a submittal does not relieve the Contractor of the responsibility for any error which may exist. The Contractor is responsible for fully complying with all contract requirements and the satisfactory construction of all work, including the need to check, confirm, and coordinate the work of all subcontractors for the project. Non-compliant material incorporated in the work will be removed and replaced at the Contractor's expense.

##### 1.2 DEFINITIONS

- A. Preconstruction Submittals: Submittals which are required prior to issuing contract notice to proceed or starting construction. For example, Certificates of insurance; Surety bonds; Site-specific safety plan; Construction progress schedule; Schedule of values; Submittal register; List of proposed subcontractors.
- B. Shop Drawings: Drawings, diagrams, and schedules specifically prepared to illustrate some portion of the work. Drawings prepared by or for the Contractor to show how multiple systems and interdisciplinary work will be integrated and coordinated.
- C. Coordination Drawings: Reproducible overlay drawings showing work with horizontal and vertical dimensions to avoid interference with structural framing, ceilings, partitions, equipment, lights, mechanical, electrical, conveying systems, and other services:
  - 1. In and above ceilings.
  - 2. Within walls.
  - 3. Within chases and shafts.
  - 4. Under concrete floors on grade.
  - 5. In mechanical spaces.
  - 6. In electrical spaces.
  - 7. Below grade.
  - 8. In tunnel.
- D. Product Data: Catalog cuts, illustrations, schedules, diagrams, performance charts, instructions, and brochures, which describe and illustrate size, physical appearance, and other characteristics of materials, systems, or equipment for some portion of the work. Samples of warranty language when the contract requires extended product warranties.
- E. Samples: Physical examples of materials, equipment, or workmanship that illustrate functional and aesthetic characteristics of a material or product and establish standards by which the work can be judged. Color samples from the manufacturer's standard line (or custom color samples if specified) to be used in selecting or approving colors for the project. Field samples and mock-ups constructed to establish standards by which the ensuing work can be judged.
- F. Design Data: Calculations, mix designs, analyses, or other data pertaining to a part of work.

- G. Test Reports: Report which includes findings of a test required to be performed by the Contractor on an actual portion of the work. 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.
- H. Certificates: Document required of Contractor, or of a manufacturer, supplier, installer, or subcontractor through Contractor. The purpose is to document procedures, acceptability of methods, or personnel qualifications for a portion of the work.
- I. Manufacturer's Instructions: Pre-printed material describing installation of a product, system, or material, including special notices and MSDS concerning impedances, hazards, and safety precautions.
- J. Manufacturer's Field Reports: Documentation of the testing and verification actions taken by manufacturer's representative at the job site on a portion of the work, during or after installation, to confirm compliance with manufacturer's standards or instructions. The documentation must indicate whether the material, product, or system has passed or failed the test.
- K. Operation and Maintenance Data: Manufacturer data that is required to operate, maintain, troubleshoot, and repair equipment, including manufacturer's help, parts list, and product line documentation. This data shall be incorporated in an operations and maintenance manual.
- L. Closeout Submittals: Documentation 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 phase of construction on a multi-phase contract.

### **1.3 RELATED WORK**

- A. Section 01 33 24; ELECTRONIC SUBMITTAL PROCEDURES.

### **1.4 SUBMITTAL REGISTER**

- A. The submittal register will list items of equipment and materials for which submittals are required by the specifications. This list may not be all inclusive and additional submittals may be required by the specifications. The Contractor is not relieved from supplying submittals required by the contract documents but which have been omitted from the submittal register.
- B. The submittal register will serve as a scheduling document for submittals and will be used to control submittal actions throughout the contract period.
- C. The VA will provide the initial submittal register in electronic format. Thereafter, the Contractor shall 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 VA.
- D. The Contractor shall update the submittal register as submittal actions occur and maintain the submittal register at the project site until final acceptance of all work by Contracting Officer.
- E. The Contractor shall submit formal monthly updates to the submittal register in electronic format. Each monthly update shall document actual submission and approval dates for each submittal.

### **1.5 SUBMITTAL SCHEDULING**

- A. Submittals are to be scheduled, submitted, reviewed, and approved prior to the acquisition of the material or equipment.
- B. Coordinate scheduling, sequencing, preparing, and processing of submittals with performance of work so that work will not be delayed by submittal processing. Allow time for potential resubmittal.
- C. No delay costs or time extensions will be allowed for time lost in late submittals or resubmittals.
- D. All submittals are required to be approved prior to the start of the specified work activity.

**1.6 SUBMITTAL PREPARATION**

- A. Each submittal is to be complete and in sufficient detail to allow ready determination of compliance with contract requirements.
- B. Collect required data for each specific material, product, unit of work, or system into a single submittal. Prominently mark choices, options, and portions applicable to the submittal. Partial submittals will not be accepted for expedition of construction effort. Submittal will be returned without review if incomplete.
- C. If available product data is incomplete, provide Contractor-prepared documentation to supplement product data and satisfy submittal requirements.
- D. All irrelevant or unnecessary data shall be removed from the submittal to facilitate accuracy and timely processing. Submittals that contain the excessive amount of irrelevant or unnecessary data will be returned with review.
- E. Provide a transmittal form for each submittal with the following information:
  - 1. Project title, location and number.
  - 2. Construction contract number.
  - 3. Date of the drawings and revisions.
  - 4. Name, address, and telephone number of subcontractor, supplier, manufacturer, and any other subcontractor associated with the submittal.
  - 5. List paragraph number of the specification section and sheet number of the contract drawings by which the submittal is required.
  - 6. When a resubmission, add alphabetic suffix on submittal description. For example, submittal 18 would become 18A, to indicate resubmission.
  - 7. Product identification and location in project.
- F. The Contractor is responsible for reviewing and certifying that all submittals are in compliance with contract requirements before submitting for VA review. Proposed deviations from the contract requirements are to be clearly identified. All deviations submitted must include a side by side comparison of item being proposed against item specified. Failure to point out deviations will result in the VA requiring removal and replacement of such work at the Contractor's expense.
- G. Stamp, sign, and date each submittal transmittal form indicating action taken.
- H. Stamp used by the Contractor on the submittal transmittal form 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: _____

**1.7 SUBMITTAL FORMAT AND TRANSMISSION**

- A. Provide submittals in electronic format, with the exception of material samples. Use PDF as the electronic format, unless otherwise specified or directed by the Contracting Officer.
- B. Compile the electronic submittal file as a single, complete document. Name the electronic submittal file specifically according to its section number and paragraph number.
- C. Electronic files must be of sufficient quality that all information is legible. Generate PDF files from original documents 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.
- D. Provide electronic documents an electronic submittal system. Confirm that the electronic submittal system can be accessed from the VA computer network. The Contractor is responsible for setting up, providing, and maintaining the electronic submittal system for the construction contract period of performance.
- E. Provide hard copies of submittals when requested by the Contracting Officer. Up to 3 additional hard copies of any submittal may be requested at the discretion of the Contracting Officer, at no additional cost to the VA.

## 1.8 RFI PREPARATION AND SUBMISSION

- A. Contractor's and Subcontractor's Responsibilities:
1. Process request through Contractor when interpretation, clarification or explanation of portion of Construction Documents is needed by Contractor, Subcontractor, Vendor or Supplier.
    - a. Review request for completeness, quality, proper referencing to drawing or specification section and reason submitted.
    - b. In event request is not acceptable return to submitter with comments regarding reason for being returned.
    - c. Make every attempt to validate, resolve or respond to RFI by thoroughly researching and reviewing Contract Documents and field conditions.
    - d. Respond to RFI accordingly if review of RFI discloses a response or is related to coordination of construction or other issue not related to Contract Documents.
    - e. If request is unclear, rewrite and state in clear, concise, correct, complete and easily understood manner.
      - 1) Include additional information if necessary, and submit to COR for response.
  2. Submit request for interpretation, clarification or explanation of Contract Documents to COR through Contractor.
    - a. List specific Contract Documents researched when seeking information being requested.
    - b. Reference applicable Contract Drawings by sheet number, section, detail, room number, door number, etc., Specifications by section and paragraph number, and reference other relevant documents.
    - c. The field titled "Regarding" on RFI form must be clear for future reference in reports or correspondence.
    - d. Clearly state request and provide Contract Document references and any additional information needed so request can be fully understood, including sketches, photos or other reference material.
    - e. Fully assess issues, suggest any reasonable solutions and include various factors, including potential costs, schedule impacts, if any, and recommendations which will aid in determining a solution or response.
      - 1) In event a reasonable solution can not be suggested, a statement to that effect should be so stated.
    - f. Indicate reason request is being submitted.
    - g. Clearly indicate critical RFI's requiring a rapid response with an explanation as to why RFI is critical.
    - h. Indicate priority for responses when multiple RFI's are submitted within short period of time.
  3. Distribute copies of responses to RFI's to all parties affected.
  4. Response to RFI shall not be considered a notice to proceed with a change that may revise the Contract Sum or Contract Time, unless authorized by the Contract Officer in writing.
  5. In event response to RFI is determined incomplete, resubmit with explanation for unacceptability of response and necessary additional information within five (5) days of receipt to RFI response.

## 1.9 COORDINATION DRAWINGS

- A. Prepare coordination drawings where careful coordination is needed for installation of products and materials fabricated by separate entities.
- B. Prepare coordination drawings where limited space availability necessitates maximum utilization of space for efficient installation of different components.
- C. Coordinate installation of different components to assure maximum accessibility for required maintenance, service, and repair.

- D. Work out all “tight” conditions involving Work of various Sections in advance of installation.
- E. Sleeve, coredrill and blockout layout drawings:
  - 1. Drawings showing proposed locations and sizes of sleeves, coredrills blockouts, and embedded items in concrete walls, columns, floors and beams.
- F. Prior to start of work in any given area, each Subcontractor approve, in writing, coordination drawings affecting Subcontractor’s work in that area.
- G. Modifications required as result of failure to resolve interferences, provide correct coordination drawings, or call attention to changes required in other work as result of modifications shall be paid for by responsible Subcontractor.
- H. Coordination meetings scheduled by Contractor, with all affected Subcontractors.
- I. Production of Coordination Drawings:
  - 1. Contractor provide minimum 1:50 1/4 IN scale plan, elevation and section drawings unless noted otherwise, showing:
    - a. Partitions.
    - b. Fire/smoke rated barriers.
    - c. Ceiling heights.
    - d. Structural framing locations and elevations.
    - e. Column lines.
    - f. Support systems.
    - g. Other work.
    - h. Existing obstructions.
  - 2. Subcontractors produce combined coordination layout drawings plan and sections of HVAC ductwork, hydronic, steam, condensate, fuel oil, fire protection piping, plumbing, special water systems, natural gas and medical gas systems electrical cable tray, conduit, conveying systems, equipment, and other work.
  - 3. Resolve major interferences at initial coordination meeting prior to production of any drawings.
  - 4. Produce initial coordination drawings within 30 days after initial meeting.
  - 5. Contractor arrange for production of said drawings not provided by that time.
  - 6. Meet as required to resolve interferences and correct drawings.
- J. After Approval:
  - 1. After Subcontractors’ written approval of coordination drawings, Contractor determine method used to resolve interferences not previously identified.
  - 2. Contractor give written approval of changes to coordination drawings prior to start of work in affected area.
  - 3. Maintain one copy of current approved Coordination Drawings at project site.
- K. Precedence Of Services For Coordination Drawings:
  - 1. In event of conflicts involving location and layout of work; use following priority to resolve disputes:
    - a. Structure and partitions have highest priority.
    - b. Equipment location and access.
    - c. Support systems
    - d. Ceiling system and recessed light fixtures.
    - e. Gravity drainage lines.
    - f. High pressure ductwork and devices.
    - g. Large pipe mains, valves and devices.
    - h. Pneumatic tube and material conveying systems.
    - i. Low pressure ductwork, diffusers, registers, grilles, HVAC equipment.
    - j. Fire protection piping, devices and heads.
    - k. Small piping, tubing, electrical conduit, and devices.

- 1) Conduits installed in corridors shall be maintained at least 9 IN above finished ceiling. Conduits shall be grouped within a 12 IN width.
  - 2) The space utilized for conduit shall be selected to allow access to all devices which normally require adjustment, repair, resetting, etc.
- l. Sleeves through rated partitions.
  - m. Access panels.

#### **1.10 SAMPLES**

- A. Submit two sets of physical samples showing range of variation, for each required item.
- B. Where samples are specified for selection of color, finish, pattern, or texture, submit the full set of available choices for the material or product specified.
- C. When color, texture, or pattern is specified by naming a particular manufacturer and style, include one sample of that manufacturer and style, for comparison.
- D. Before submitting samples, the Contractor is to ensure 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.
- E. The VA reserves the right to disapprove any material or equipment which previously has proven unsatisfactory in service.
- F. Physical samples supplied maybe requested back for use in the project after reviewed and approved.

#### **1.11 OPERATION AND MAINTENANCE DATA**

- A. Submit data specified for a given item within 30 calendar days after the item is delivered to the contract site.
- B. In the event the Contractor fails to deliver O&M Data within the time limits specified, the Contracting Officer may withhold from progress payments 50 percent of the price of the item with which such O&M Data are applicable.

#### **1.12 TEST REPORTS**

- A. SRE may require specific test after work has been installed or completed which could require contractor to repair test area at no additional cost to contract.

#### **1.13 VA REVIEW OF SUBMITTALS AND RFIS**

- A. The VA will review all submittals for compliance with the technical requirements of the contract documents. The Architect-Engineer for this project will assist the VA in reviewing all submittals and determining contractual compliance. Review will be only for conformance with the applicable codes, standards and contract requirements.
- B. Period of review for submittals begins when the VA COR receives submittal from the Contractor.
- C. Period of review for each resubmittal is the same as for initial submittal.
- D. VA review period is 21 working days for submittals.
- E. VA review period is 21 working days for RFIs.
  1. COR may return RFI without response for following reasons:
    - a. Request is unclear or incomplete.
    - b. Detailed information not provided.
    - c. Is related to construction means, methods or techniques.
    - d. Is related to health or safety measures.
    - e. Is due to Contractor's lack of adequate coordination.
    - f. Is for coordination between Subcontractors.
    - g. Is considered a "Contractor Proposed Change".

Shop Drawings, Product Data, and Samples

- h. Is due to non-conformance.
- i. Response is required by another party.
- 2. If requested information is available from careful study and comparison of Contract Documents, field conditions, other VA-provided information, coordination drawings, or prior Project correspondence or documentation, Architect-Engineer may invoice VA as a change in services for costs involved in Architect-Engineer's review, analysis, responding and processing of such RFI.
  - a. Contractor shall reimburse Government for such costs.
- F. The VA will return submittals to the Contractor with the following notations:
  - 1. "Approved": authorizes the Contractor to proceed with the work covered.
  - 2. "Approved as noted": authorizes the Contractor to proceed with the work covered provided the Contractor incorporates the noted comments and makes the noted corrections.
  - 3. "Disapproved, revise and resubmit": indicates noncompliance with the contract requirements or that submittal is incomplete. Resubmit with appropriate changes and corrections. No work shall proceed for this item until resubmittal is approved.
  - 4. "Not reviewed": indicates submittal 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 after taking appropriate action.

#### **1.14 APPROVED SUBMITTALS**

- A. The VA approval of submittals is not to be construed as a complete check, and indicates only that the general method of construction, materials, detailing, and other information are satisfactory.
- B. VA approval of a submittal does not relieve the Contractor of the responsibility for any error which may exist. The Contractor is responsible for fully complying with all contract requirements and the satisfactory construction of all work, including the need to check, confirm, and coordinate the work of all subcontractors for the project. Non-compliant material incorporated in the work will be removed and replaced at the Contractor's expense.
- C. After submittals have been approved, no resubmittal for the purpose of substituting materials or equipment will be considered unless accompanied by an explanation of why a substitution is necessary.
- D. Retain a copy of all approved submittals at project site, including approved samples.

#### **1.15 WITHHOLDING OF PAYMENT**

- A. Payment for materials incorporated in the work will not be made if required approvals have not been obtained.

--- E N D ---

## **SECTION 01 33 24**

### **ELECTRONIC SUBMITTAL PROCEDURES**

#### **PART 1 - GENERAL**

##### **1.1 DESCRIPTION**

- A. This section specifies requirements for provision and use of an electronic, web-based service for submittal and tracking of construction submittals for the Project.

##### **1.2 REFERENCED DOCUMENTS**

- A. Additional submittal requirements: Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

##### **1.3 SUMMARY:**

- A. The intent of electronic submittals is to expedite the construction process by reducing paperwork, improving information flow, and decreasing turnaround time.
- B. Shop drawing and product data submittals shall be transmitted to Architect in electronic (PDF) format using a web-based service designed specifically for transmitting and tracking submittals between construction team members.
- C. The electronic submittal process is not intended for color samples, color charts, or physical material samples.

##### **1.4 GENERAL DESCRIPTION OF PROCEDURES:**

- A. Submittal Preparation - Contractor may use any or all of the following options:
  - 1. Subcontractors and Suppliers provide electronic (PDF) submittals to Contractor via the electronic submittal website.
  - 2. Subcontractors and Suppliers provide paper submittals to General Contractor who electronically scans and converts to PDF format.
    - a. General Contractor shall perform Optical Character Resolution (OCR) routines as required by Section 01 33 23 1.6 C.
  - 3. Subcontractors and Suppliers provide paper submittals to Scanning Service which electronically scans and converts to PDF format.
    - a. Scanning Service shall perform Optical Character Resolution (OCR) routines as required by Section 01 33 23 1.6 C.
- B. Contractor shall review, comment, and apply electronic stamp certifying that the submittal (as noted) complies with the requirements of the Contract Documents including verification of manufacturer / product, dimensions and coordination of information with other parts of the work.
- C. Contractor shall transmit each submittal to Architect and COR (simultaneously) using the web-based electronic submittal service.
- D. Architect / Engineer review comments will be made available on web-based electronic submittal service. COR shall receive email notice of completed review.
- E. COR review comments will be made available on web-based electronic submittal service. Contractor shall receive email notice of completed review.
- F. Distribution of reviewed submittals to subcontractors and suppliers is the responsibility of the Contractor.

## 1.5 REQUIREMENTS AND RESPONSIBILITIES

- A. Electronic Submittal Service shall provide:
1. Web-based tracking and approval system.
  2. Automated email notice for new submittals and reminders for submittals approaching the review deadline.
  3. Tracking and exchange of ITC/RFI/CO's and other similar document as well as product and equipment submittals.
  4. Means for tracking of the status such documents including whether they have been approved and released by the Owner.
  5. Organized storage of submittals that is accessible for review by the designated construction team members at any time.
  6. Submit a complete set of submittal on CD to the Owner at the end of the Project. Include all submittals included product submittals, shop drawings, ITC/RFI/CO's and other similar submittals.
- B. Contractor responsibilities:
1. Training in the use of the service by the team members shall be at the option of the Contractor and, if chosen, shall be paid by the Contractor.
  2. Contractor shall have or obtain required hardware and software: Internet Service and Equipment Requirements:
  3. Email address and Internet access at Contractor's main office.
  4. Adobe Acrobat ([www.adobe.com](http://www.adobe.com)), Bluebeam PDF Revu ([www.bluebeam.com](http://www.bluebeam.com)), or other similar PDF review software for applying electronic stamps and comments.
  5. Contractor shall prepare or have prepared all required submittals in the PDF format required.
  6. PDF files must be readable. As a general rule, a resolution of 300 dpi should be used.
  7. If the Architect can download more readable product data directly from the manufacturer's website than was submitted by the Contractor, the Architect shall reserve the right to reject the submittal.
  8. Other responsibilities for submittals shall be as described in Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
  9. Color samples, color charts, or physical material samples shall be submitted as described in Section 01 33 23.

## 1.6 ACCEPTABLE SERVICES

- A. Submittal Exchange®, Autodesk Build® and/or ProCore or approved equal for the duration of the contract.
- B. Substitutions must be submitted with Contractor Bid,...

**--- END ---**

**SECTION 01 35 26**

**SAFETY REQUIREMENTS**

**PART 1 - GENERAL**

**1.1 APPLICABLE PUBLICATIONS:**

- A. Latest publications listed below form part of this Article to extent referenced. Publications are referenced in text by basic designations only.
- B. American Society of Safety Engineers (ASSE):
  - A10.1-2011.....Pre-Project & Pre-Task Safety and Health Planning
  - A10.34-2012.....Protection of the Public on or Adjacent to Construction Sites
  - A10.38-2013.....Basic Elements of an Employer’s Program to Provide a Safe and Healthful Work Environment American National Standard Construction and Demolition Operations
- C. American Society for Testing and Materials (ASTM):
  - E84-2013.....Surface Burning Characteristics of Building Materials
- D. The Facilities Guidelines Institute (FGI):
  - FGI Guidelines-2018 Guidelines for Design and Construction of Healthcare Facilities
- E. National Fire Protection Association (NFPA):
  - 10-2018 ..... Standard for Portable Fire Extinguishers
  - 30-2018 ..... Flammable and Combustible Liquids Code
  - 51B-2019..... Standard for Fire Prevention During Welding, Cutting and Other Hot Work
  - 70-2020 ..... National Electrical Code
  - 70B-2019..... Recommended Practice for Electrical Equipment Maintenance
  - 70E-2018 ..... Standard for Electrical Safety in the Workplace
  - 99-2018 ..... Health Care Facilities Code
  - 241-2019 ..... Standard for Safeguarding Construction, Alteration, and Demolition Operations
- F. The Joint Commission (TJC)
  - TJC Manual ..... Comprehensive Accreditation and Certification Manual
- G. U.S. Nuclear Regulatory Commission
  - 10 CFR 20 ..... Standards for Protection Against Radiation
- H. U.S. Occupational Safety and Health Administration (OSHA):
  - 29 CFR 1910 ..... Safety and Health Regulations for General Industry
  - 29 CFR 1926 ..... Safety and Health Regulations for Construction Industry
- I. VHA Directive 7712-17
- J. VHA Directive 7715-17

**1.2 DEFINITIONS:**

- A. Critical Lift. A lift with the hoisted load exceeding 75% of the crane’s maximum capacity; lifts made out of the view of the operator (blind picks); lifts involving two or more cranes; personnel being hoisted; and special hazards such as lifts over occupied facilities, loads lifted close to

power-lines, and lifts in high winds or where other adverse environmental conditions exist; and any lift which the crane operator believes is critical.

- B. OSHA "Competent Person" (CP). One who is capable of identifying existing and predictable hazards in the surroundings and working conditions which are unsanitary, hazardous or dangerous to employees, and who has the authorization to take prompt corrective measures to eliminate them (see 29 CFR 1926.32(f)).
- C. "Qualified Person" means one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience, has successfully demonstrated his ability to solve or resolve problems relating to the subject matter, the work, or the project.
- D. High Visibility Accident. Any mishap which may generate publicity or high visibility.
- E. Accident/Incident Criticality Categories:
  - 1. No impact – near miss incidents that should be investigated but are not required to be reported to the VA.
  - 2. Minor incident/impact – incidents that require first aid or result in minor equipment damage (less than \$5000). These incidents must be investigated but are not required to be reported to the VA;
  - 3. Moderate incident/impact – Any work-related injury or illness that results in:
    - a. Days away from work (any time lost after day of injury/illness onset);
    - b. Restricted work;
    - c. Transfer to another job;
    - d. Medical treatment beyond first aid;
    - e. Loss of consciousness;
  - 4. A significant injury or illness diagnosed by a physician or other licensed health care professional, even if it did not result in (1) through (5) above or,
- F. These incidents must be investigated and are required to be reported to the VA;
  - 1. Major incident/impact – Any mishap that leads to fatalities, hospitalizations, amputations, and losses of an eye as a result of contractors' activities. Or any incident which leads to major property damage (greater than \$20,000) and/or may generate publicity or high visibility. These incidents must be investigated and are required to be reported to the VA as soon as practical, but not later than 2 hours after the incident.
- G. Medical Treatment. 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.

### **1.3 REGULATORY REQUIREMENTS:**

- A. In addition to the detailed requirements included in the provisions of this contract, comply with 29 CFR 1926, comply with 29 CFR 1910 as incorporated by reference within 29 CFR 1926, comply with ASSE A10.34, and all applicable federal, state, and local laws, ordinances, criteria, rules and regulations New York. Submit matters of interpretation of standards 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 except with specific approval and acceptance by the Contracting Officer Representative .

### **1.4 ACCIDENT PREVENTION PLAN (APP):**

- A. The APP (aka Construction Safety & Health Plan) shall interface with the Contractor's overall safety and health program. Include any portions of the Contractor's overall safety and health program referenced in the APP in the applicable APP element and ensure it is site-specific. The Government considers the Prime Contractor to be the "controlling authority" for all worksite safety and health of each subcontractor(s). 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.

1. The APP shall be prepared as follows:
  - a. Written in English by a qualified person who is employed by the Prime Contractor articulating the specific work and hazards pertaining to the contract (model language can be found in ASSE A10.33). Specifically articulating the safety requirements found within these VA contract safety specifications.
  - b. Address both the Prime Contractors and the subcontractors work operations.
  - c. State measures to be taken to control hazards associated with materials, services, or equipment provided by suppliers.
  - d. Address all the elements/sub-elements and in order as follows:
    - 1) SIGNATURE SHEET. Title, signature, and phone number of the following:
      - a) Plan preparer (Qualified Person such as corporate safety staff person or contracted Certified Safety Professional with construction safety experience);
      - b) Plan approver (company/corporate officers authorized to obligate the company);
      - c) Plan concurrence (e.g., Chief of Operations, Corporate Chief of Safety, Corporate Industrial Hygienist, project manager or superintendent, project safety professional). Provide concurrence of other applicable corporate and project personnel (Contractor).
    - 2) BACKGROUND INFORMATION. List the following:
      - a) Contractor.
      - b) Contract number.
      - c) Project name;
      - d) Brief project description, description of work to be performed, and location; phases of work anticipated (these will require an AHA).
    - 3) STATEMENT OF SAFETY AND HEALTH POLICY. Provide a copy of current corporate/company Safety and Health Policy Statement, detailing commitment to providing a safe and healthful workplace for all employees. The Contractor's written safety program goals, objectives, and accident experience goals for this contract should be provided.
    - 4) RESPONSIBILITIES AND LINES OF AUTHORITIES. Provide the following:
      - a) A statement of the employer's ultimate responsibility for the implementation of his SOH program;
      - b) Identification and accountability of personnel responsible for safety at both corporate and project level. Contracts specifically requiring safety or industrial hygiene personnel shall include a copy of their resumes.
      - c) The names of Competent and/or Qualified Person(s) and proof of competency/qualification to meet specific OSHA Competent/Qualified Person(s) requirements must be attached.;
      - d) Requirements that no work shall be performed unless a designated competent person is present on the job site;
      - e) Requirements for pre-task Activity Hazard Analysis (AHAs);
      - f) Lines of authority;
      - g) Policies and procedures regarding noncompliance with safety requirements (to include disciplinary actions for violation of safety requirements) should be identified;
    - 5) SUBCONTRACTORS AND SUPPLIERS. If applicable, provide procedures for coordinating SOH activities with other employers on the job site:
      - a) Identification of subcontractors and suppliers (if known)
      - b) Safety responsibilities of subcontractors and suppliers.
    - 6) TRAINING.

- a) Site-specific SOH orientation training at the time of initial hire or assignment to the project for every employee before working on the project site is required.
  - b) Mandatory training and certifications that are applicable to this project (e.g., explosive actuated tools, crane operator, rigger, crane signal person, fall protection, electrical lockout/NFPA 70E, machine/equipment lockout, confined space, etc....) and any requirements for periodic retraining/recertification are required.
  - c) 3) Procedures for ongoing safety and health training for supervisors and employees shall be established to address changes in site hazards/conditions.
  - d) 4) OSHA 10-hour training is required for all workers on site and the OSHA 30-hour training is required for Trade Competent Persons (CPs)
- 7) SAFETY AND HEALTH INSPECTIONS.
- a) Specific assignment of responsibilities for a minimum daily job site safety and health inspection during periods of work activity: Who will conduct (e.g., "Site Safety and Health CP"), proof of inspector's training/qualifications, when inspections will be conducted, procedures for documentation, deficiency tracking system, and follow-up procedures.
  - b) Any external inspections/certifications that may be required (e.g., contracted CSP or CSHT)
- 8) ACCIDENT/INCIDENT INVESTIGATION & REPORTING. The Contractor shall conduct mishap investigations of all Moderate and Major as well as all High Visibility Incidents. The APP shall include accident/incident investigation procedure and identify person(s) responsible to provide the following to the Contracting Officer Representative:
- a) Exposure data (man-hours worked);
  - b) Accident
  - c) Project site injury and illness logs.
- 9) PLANS (PROGRAMS, PROCEDURES) REQUIRED. Based on a risk assessment of contracted activities and on mandatory OSHA compliance programs, the Contractor shall address all applicable occupational, patient, and public safety risks in site-specific compliance and accident prevention plans. These Plans shall include but are not be limited to procedures for addressing the risks associates with the following:
- a) Emergency response;
  - b) Contingency for severe weather;
  - c) Fire Prevention;
  - d) Medical Support;
  - e) Posting of emergency telephone numbers;
  - f) Prevention of alcohol and drug abuse;
  - g) Site sanitation(housekeeping, drinking water, toilets);
  - h) Night operations and lighting;
  - i) Hazard communication program;
  - j) Welding/Cutting "Hot" work.
  - k) Electrical Safe Work Practices (Electrical LOTO/NFPA 70E);
  - l) General Electrical Safety;
  - m) Hazardous energy control (Machine LOTO);
  - n) Site-Specific Fall Protection & Prevention;
  - o) Excavation/trenching;
  - p) Asbestos abatement;
  - q) Lead abatement;
  - r) Crane Critical lift;

Safety Requirements

- s) Respiratory protection;
  - t) Health hazard control program;
  - u) Radiation Safety Program;
  - v) Abrasive blasting;
  - w) Heat/Cold Stress Monitoring;
  - x) Crystalline Silica Monitoring (Assessment);
  - y) Demolition plan (to include engineering survey);
  - z) Formwork and shoring erection and removal;
  - aa) Concrete;
  - bb) Public (Mandatory compliance with ANSI/ASSE A10.34-2012).
- B. Submit the APP to the Contracting Officer Representative for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES 15 calendar days prior to the date of the preconstruction conference for acceptance. Work cannot proceed without an accepted APP.
- C. Once accepted by the Contracting Officer Representative, the APP and attachments will be enforced as part of the contract. Disregarding the provisions of this contract or the accepted APP will be cause for stopping of work, at the discretion of the Contracting Officer in accordance with FAR Clause 52.236-13, *Accident Prevention*, until the matter has been rectified.
- D. Once work begins, changes to the accepted APP shall be made with the knowledge and concurrence of the Contracting Officer Representative. 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/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 and the environment.

#### 1.5 ACTIVITY HAZARD ANALYSES (AHAS):

- A. AHAs are also known as Job Hazard Analyses, Job Safety Analyses, and Activity Safety Analyses. Before beginning each work activity involving a type of work presenting hazards not experienced in previous project operations or where a new work crew or sub-contractor is to perform the work, the Contractor(s) performing that work activity shall prepare an AHA (Example electronic AHA forms can be found on the US Army Corps of Engineers web site)
- B. AHAs shall define the activities being performed and identify the work sequences, the specific anticipated hazards, site conditions, equipment, materials, and the control measures to be implemented to eliminate or reduce each hazard to an acceptable level of risk.
- C. Work shall not begin until the AHA for the work activity has been accepted by the Contracting Officer Representative and discussed with all engaged in the activity, including the Contractor, subcontractor(s), and Government on-site representatives at preparatory and initial control phase meetings.
1. The names of the Competent/Qualified Person(s) required for a particular activity (for example, excavations, scaffolding, fall protection, other activities as specified by OSHA and/or other State and Local agencies) shall be identified and included in the AHA. Certification of their competency/qualification shall be submitted to the Government Designated Authority (GDA) for acceptance prior to the start of that work activity.
  2. The AHA shall be reviewed and modified as necessary to address changing site conditions, operations, or change of competent/qualified person(s).
    - a. If more than one Competent/Qualified Person is used on the AHA activity, a list of names shall be submitted as an attachment to the AHA. Those listed must be Competent/Qualified for the type of work involved in the AHA and familiar with current site safety issues.

- b. If a new Competent/Qualified Person (not on the original list) is added, the list shall be updated (an administrative action not requiring an updated AHA). The new person shall acknowledge in writing that he or she has reviewed the AHA and is familiar with current site safety issues.
3. Submit AHAs to the Contracting Officer Representative for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES for review at least 15 calendar days prior to the start of each phase. Subsequent AHAs as shall be formatted as amendments to the APP. The analysis should be used during daily inspections to ensure the implementation and effectiveness of the activity's safety and health controls.
4. The AHA list will be reviewed periodically (at least monthly) at the Contractor supervisory safety meeting and updated as necessary when procedures, scheduling, or hazards change.
5. Develop the activity hazard analyses using the project schedule as the basis for the activities performed. All activities listed on the project schedule will require an AHA. The AHAs will be developed by the contractor, supplier, or subcontractor and provided to the prime contractor for review and approval and then submitted to the Contracting Officer Representative.

#### **1.6 PRECONSTRUCTION CONFERENCE:**

- A. Contractor representatives who have a responsibility or significant role in implementation of the accident prevention program, as required by 29 CFR 1926.20(b)(1), on the project shall attend the preconstruction conference to gain a mutual understanding of its implementation. This includes the project superintendent, subcontractor superintendents, and any other assigned safety and health professionals.
- 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's representative as to which phases will require an analysis. In addition, establish a schedule for the preparation, submittal, review, and acceptance of AHAs to preclude project delays.
- C. Deficiencies in the submitted APP will be brought to the attention of the Contractor within 14 days of submittal, and the Contractor shall revise the plan to correct deficiencies and re-submit it for acceptance. Do not begin work until there is an accepted APP.

#### **1.7 "SITE SAFETY AND HEALTH OFFICER" (SSHO) AND "COMPETENT PERSON" (CP):**

- A. The Prime Contractor shall designate a minimum of one SSHO at each project site that will be identified as the SSHO to administer the Contractor's safety program and government-accepted Accident Prevention Plan. Each subcontractor shall designate a minimum of one CP in compliance with 29 CFR 1926.20 (b)(2) that will be identified as a CP to administer their individual safety programs.
- B. Further, all specialized Competent Persons for the work crews will be supplied by the respective contractor as required by 29 CFR 1926 (i.e. Asbestos, Electrical, Cranes, & Derricks, Demolition, Fall Protection, Fire Safety/Life Safety, Ladder, Rigging, Scaffolds, and Trenches/Excavations).
- C. These Competent Persons can have collateral duties as the subcontractor's superintendent and/or work crew lead persons as well as fill more than one specialized CP role (i.e. Asbestos, Electrical, Cranes, & Derricks, Demolition, Fall Protection, Fire Safety/Life Safety, Ladder, Rigging, Scaffolds, and Trenches/Excavations). However, the SSHO has be a separate qualified individual from the Prime Contractor's Superintendent and/or Quality Control Manager with duties only as the SSHO.

- D. The SSHO or an equally-qualified Designated Representative/alternate will maintain a presence on the site during construction operations in accordance with FAR Clause 52.236-6: *Superintendence by the Contractor*. CPs will maintain presence during their construction activities in accordance with above mentioned clause. A listing of the designated SSHO and all known CPs shall be submitted prior to the start of work as part of the APP with the training documentation and/or AHA as listed in Section 1.8 below.
- E. The repeated presence of uncontrolled hazards during a contractor's work operations will result in the designated CP as being deemed incompetent and result in the required removal of the employee in accordance with FAR Clause 52.236-5: Material and Workmanship, Paragraph (c).

**1.8 TRAINING:**

- A. The designated Prime Contractor SSHO must meet the requirements of all applicable OSHA standards and be capable (through training, experience, and qualifications) of ensuring that the requirements of 29 CFR 1926.16 and other appropriate Federal, State and local requirements are met for the project. As a minimum the SSHO must have completed the OSHA 30-hour Construction Safety class and have five (5) years of construction industry safety experience or three (3) years if he/she possesses a Certified Safety Professional (CSP) or certified Construction Safety and Health Technician (CSHT) certification or have a safety and health degree from an accredited university or college.
- B. All designated CPs shall have completed the OSHA 30-hour Construction Safety course within the past 5 years.
- C. In addition to the OSHA 30 Hour Construction Safety Course, all CPs with high hazard work operations such as operations involving asbestos, electrical, cranes, demolition, work at heights/fall protection, fire safety/life safety, ladder, rigging, scaffolds, and trenches/excavations shall have a specialized formal course in the hazard recognition & control associated with those high hazard work operations. Documented "repeat" deficiencies in the execution of safety requirements will require retaking the requisite formal course.
- D. All other construction workers shall have the OSHA 10-hour Construction Safety Outreach course and any necessary safety training to be able to identify hazards within their work environment.
- E. Submit training records associated with the above training requirements to the Contracting Officer Representative for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES 15calendar days prior to the date of the preconstruction conference for acceptance.
- F. Prior to any worker for the contractor or subcontractors beginning work, they shall undergo a safety briefing provided by the SSHO or his/her designated representative. As a minimum, this briefing shall include information on the site-specific hazards, construction limits, VAMC safety guidelines, means of egress, break areas, work hours, locations of restrooms, use of VAMC equipment, emergency procedures, accident reporting etc... Documentation shall be provided to the Resident Engineer that individuals have undergone contractor's safety briefing.
- G. Ongoing safety training will be accomplished in the form of weekly documented safety meeting.

**1.9 INSPECTIONS:**

- A. The SSHO shall conduct frequent and regular safety inspections (daily) of the site and each of the subcontractors CPs shall conduct frequent and regular safety inspections (daily) of their work operations as required by 29 CFR 1926.20(b)(2). Each week, the SSHO shall conduct a formal documented inspection of the entire construction areas with the subcontractors' "Trade Safety and Health CPs" present in their work areas. Coordinate with, and report findings and corrective actions weekly to Contracting Officer Representative.
- B. A Certified Safety Professional (CSP) with specialized knowledge in construction safety or a certified Construction Safety and Health Technician (CSHT) shall randomly conduct a monthly

site safety inspection. The CSP or CSHT can be a corporate safety professional or independently contracted. The CSP or CSHT will provide their certificate number on the required report for verification as necessary.

1. Results of the inspection will be documented with tracking of the identified hazards to abatement.
2. The Contracting Officer Representative will be notified immediately prior to start of the inspection and invited to accompany the inspection.
3. Identified hazard and controls will be discussed to come to a mutual understanding to ensure abatement and prevent future reoccurrence.
4. A report of the inspection findings with status of abatement will be provided to the Contracting Officer Representative within one week of the onsite inspection.

#### **1.10 ACCIDENTS, OSHA 300 LOGS, AND MAN-HOURS:**

- A. The prime contractor shall establish and maintain an accident reporting, recordkeeping, and analysis system to track and analyze all injuries and illnesses, high visibility incidents, and accidental property damage (both government and contractor) that occur on site. Notify the Contracting Officer Representative as soon as practical, but no more than four hours after any accident meeting the definition of a Moderate or Major incidents, High Visibility Incidents, , or any weight handling and hoisting equipment accident. 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 (to include type of construction equipment used, PPE used, etc.). Preserve the conditions and evidence on the accident site until the Contracting Officer Representative determine whether a government investigation will be conducted.
- B. Conduct an accident investigation for all Minor, Moderate and Major incidents as defined in paragraph DEFINITIONS, and property damage accidents resulting in at least \$20,000 in damages, to establish the root cause(s) of the accident. Complete the VA Form 2162 (or equivalent) , and provide the report to the Contracting Officer Representative within 5 calendar days of the accident. The Contracting Officer Representative will provide copies of any required or special forms.
- C. A summation of all man-hours worked by the contractor and associated sub-contractors for each month will be reported to the Contracting Officer Representative monthly.
- D. A summation of all Minor, Moderate, and Major incidents experienced on site by the contractor and associated sub-contractors for each month will be provided to the Contracting Officer Representative monthly. The contractor and associated sub-contractors' OSHA 300 logs will be made available to the Contracting Officer Representative as requested.

#### **1.11 PERSONAL PROTECTIVE EQUIPMENT (PPE):**

- A. PPE is governed in all areas by the nature of the work the employee is performing. For example, specific PPE required for performing work on electrical equipment is identified in NFPA 70E, Standard for Electrical Safety in the Workplace.
- B. Mandatory PPE includes:
  1. Hard Hats – unless written authorization is given by the Contracting Officer Representative in circumstances of work operations that have limited potential for falling object hazards such as during finishing work or minor remodeling. With authorization to relax the requirement of hard hats, if a worker becomes exposed to an overhead falling object hazard, then hard hats would be required in accordance with the OSHA regulations.
  2. Safety glasses - unless written authorization is given by the Contracting Officer Representative in circumstances of no eye hazards, appropriate safety glasses meeting the ANSI Z.87.1 standard must be worn by each person on site.

3. Appropriate Safety Shoes – based on the hazards present, safety shoes meeting the requirements of ASTM F2413-11 shall be worn by each person on site unless written authorization is given by the Contracting Officer Representative in circumstances of no foot hazards.
4. Hearing protection - Use personal hearing protection at all times in designated noise hazardous areas or when performing noise hazardous tasks.

#### 1.12 INFECTION CONTROL

- A. Infection Control is critical in all medical center facilities. Interior construction activities causing disturbance of existing dust, or creating new dust, must be conducted within ventilation-controlled areas that minimize the flow of airborne particles into patient areas. Exterior construction activities causing disturbance of soil or creates dust in some other manner must be controlled.
- B. An AHA associated with infection control will be performed by VA personnel in accordance with FGI Guidelines (i.e. Infection Control Risk Assessment (ICRA)). The ICRA procedure found on the American Society for Healthcare Engineering (ASHE) website will be utilized. Risk classifications of Class II or lower will require approval by the Contracting Officer Representative before beginning any construction work. Risk classifications of Class III or higher will require a permit before beginning any construction work. Infection Control permits will be issued by the COR. The Infection Control Permits will be posted outside the appropriate construction area. More than one permit may be issued for a construction project if the work is located in separate areas requiring separate classes. The primary project scope area for this project is: Class IV however, work outside the primary project scope area may vary. The required infection control precautions with each class are as follows:
  1. Class I requirements:
    - a. During Construction Work:
      - 1) Notify the Contracting Officer Representative
      - 2) Execute work by methods to minimize raising dust from construction operations.
      - 3) Ceiling tiles: Immediately replace a ceiling tiles displaced for visual inspection.
    - b. Upon Completion:
      - 1) Clean work area upon completion of task
      - 2) Notify the Contracting Officer Representative
  2. Class II requirements:
    - a. During Construction Work:
      - 1) Notify the Contracting Officer Representative
      - 2) Provide active means to prevent airborne dust from dispersing into atmosphere such as wet methods or tool mounted dust collectors where possible.
      - 3) Water mist work surfaces to control dust while cutting.
      - 4) Seal unused doors with duct tape.
      - 5) Block off and seal air vents.
      - 6) Remove or isolate HVAC system in areas where work is being performed.
    - b. Upon Completion:
      - 1) Wipe work surfaces with cleaner/disinfectant.
      - 2) Contain construction waste before transport in tightly covered containers.
      - 3) Wet mop and/or vacuum with HEPA filtered vacuum before leaving work area.
      - 4) Upon completion, restore HVAC system where work was performed
      - 5) Notify the Contracting Officer Representative
  3. Class III requirements:
    - a. During Construction Work:
      - 1) Obtain permit from the Contracting Officer Representative

- 2) Remove or Isolate HVAC system in area where work is being done to prevent contamination of duct system.
  - 3) Complete all critical barriers i.e. sheetrock, plywood, plastic, to seal area from non-work area or implement control cube method (cart with plastic covering and sealed connection to work site with HEPA vacuum for vacuuming prior to exit) before construction begins. Install construction barriers and ceiling protection carefully, outside of normal work hours.
  - 4) Maintain negative air pressure, 0.03 inches of water gauge, within work site utilizing HEPA equipped air filtration units and continuously monitored with a digital display, recording and alarm instrument, which must be calibrated on installation, maintained with periodic calibration and monitored by the contractor.
  - 5) HEPA units shall be provided with new filters at the beginning of the project and filters shall be periodically changed per manufacturer's recommendations.
  - 6) Contain construction waste before transport in tightly covered containers.
  - 7) Cover transport receptacles or carts. Tape covering unless solid lid.
  - b. Upon Completion:
    - 1) Do not remove barriers from work area until completed project is inspected by the Contracting Officer Representative and thoroughly cleaned by the VA Environmental Services Department.
    - 2) Remove construction barriers and ceiling protection carefully to minimize spreading of dirt and debris associated with construction, outside of normal work hours.
    - 3) Vacuum work area with HEPA filtered vacuums.
    - 4) Wet mop area with cleaner/disinfectant.
    - 5) Upon completion, restore HVAC system where work was performed.
    - 6) Return permit to the Contracting Officer Representative
4. Class IV requirements:
- a. During Construction Work:
    - 1) Obtain permit from the Contracting Officer Representative
    - 2) Isolate HVAC system in area where work is being done to prevent contamination of duct system.
    - 3) Complete all critical barriers i.e. sheetrock, plywood, plastic, to seal area from non-work area or implement control cube method (cart with plastic covering and sealed connection to work site with HEPA vacuum for vacuuming prior to exit) before construction begins. Install construction barriers and ceiling protection carefully, outside of normal work hours.
    - 4) Maintain negative air pressure, 0.03 inches of water gauge, within work site utilizing HEPA equipped air filtration units and continuously monitored with a digital display, recording and alarm instrument, which must be calibrated on installation, maintained with periodic calibration and monitored by the contractor.
    - 5) HEPA units shall be provided with new filters at the beginning of the project and filters shall be periodically changed per manufacturer's recommendations.
    - 6) Seal holes, pipes, conduits, and punctures.
    - 7) Construct anteroom and require all personnel to pass through this room so they can be vacuumed using a HEPA vacuum cleaner before leaving work site or they can wear cloth or paper coveralls that are removed each time they leave work site.
    - 8) All personnel entering work site are required to wear shoe covers. Shoe covers must be changed each time the worker exits the work area.
  - b. Upon Completion:

- 1) Do not remove barriers from work area until completed project is inspected by the Contracting Officer Representative with thorough cleaning by the VA Environmental Services Dept.
  - 2) Remove construction barriers and ceiling protection carefully to minimize spreading of dirt and debris associated with construction, outside of normal work hours.
  - 3) Contain construction waste before transport in tightly covered containers.
  - 4) Cover transport receptacles or carts. Tape covering unless solid lid.
  - 5) Vacuum work area with HEPA filtered vacuums.
  - 6) Wet mop area with cleaner/disinfectant.
  - 7) Upon completion, restore HVAC system where work was performed.
  - 8) Return permit to the Contracting Officer Representative
- C. Barriers shall be erected as required based upon classification (Class III & IV requires barriers) and shall be constructed as follows:
1. Class III and IV - closed door with masking tape applied over the frame and door is acceptable for projects that can be contained in a single room.
  2. Construction, demolition or reconstruction not capable of containment within a single room must have the following barriers erected and made presentable on hospital occupied side:
    - a. Class III & IV (where dust control is the only hazard, and an agreement is reached with the Resident Engineer and Medical Center) - Airtight plastic barrier that extends from the floor to ceiling. Seams must be sealed with duct tape to prevent dust and debris from escaping
    - b. Class III & IV - Drywall barrier erected with joints covered or sealed to prevent dust and debris from escaping.
    - c. Class III & IV - Seal all penetrations in existing barrier airtight
    - d. Class III & IV - Barriers at penetration of ceiling envelopes, chases and ceiling spaces to stop movement air and debris
    - e. Class IV only - Anteroom or double entrance openings that allow workers to remove protective clothing or vacuum off existing clothing
    - f. Class III & IV - At elevators shafts or stairways within the field of construction, overlapping flap minimum of two feet wide of polyethylene enclosures for personnel access.
- D. Products and Materials:
1. Sheet Plastic: Fire retardant polystyrene, 6-mil thickness meeting local fire codes
  2. Barrier Doors: Self Closing One-hour fire-rated solid core wood in steel frame, painted
  3. Dust proof one-hour fire-rated drywall
  4. High Efficiency Particulate Air-Equipped filtration machine rated at 95% capture of 0.3 microns including pollen, mold spores and dust particles. HEPA filters should have ASHRAE 85 or other prefilter to extend the useful life of the HEPA. Provide both primary and secondary filtrations units. Maintenance of equipment and replacement of the HEPA filters and other filters will be in accordance with manufacturer's instructions.
  5. Exhaust Hoses: Heavy duty, flexible steel reinforced; Ventilation Blower Hose
  6. Adhesive Walk-off Mats: Provide minimum size mats of 24 inches x 36 inches
  7. Disinfectant: Hospital-approved disinfectant or equivalent product
  8. Portable Ceiling Access Module
- E. Before any construction on site begins, all contractor personnel involved in the construction or renovation activity shall be educated and trained in infection prevention measures established by the medical center.
- F. A dust control program will be establish and maintained as part of the contractor's infection preventive measures in accordance with the FGI Guidelines for Design and Construction of Healthcare Facilities. Prior to start of work, prepare a plan detailing project-specific dust protection measures with associated product data, including periodic status reports, and submit

to Project Engineer and Facility CSC for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES.

- G. Medical center Infection Control personnel will monitor for airborne disease (e.g. aspergillosis) during construction. A baseline of conditions will be established by the medical center prior to the start of work and periodically during the construction stage to determine impact of construction activities on indoor air quality with safe thresholds established.
- H. In general, the following preventive measures shall be adopted during construction to keep down dust and prevent mold.
  - 1. Contractor shall verify that construction exhaust to exterior is not reintroduced to the medical center through intake vents or building openings. HEPA filtration is required where the exhaust dust may reenter the medical center.
  - 2. Exhaust hoses shall be exhausted so that dust is not reintroduced to the medical center.
  - 3. Adhesive Walk-off/Carpet Walk-off Mats shall be used at all interior transitions from the construction area to occupied medical center area. These mats shall be changed as often as required to maintain clean work areas directly outside construction area at all times.
  - 4. Vacuum and wet mop all transition areas from construction to the occupied medical center at the end of each workday. Vacuum shall utilize HEPA filtration. Maintain surrounding area frequently. Remove debris as it is created. Transport these outside the construction area in containers with tightly fitting lids.
  - 5. The contractor shall not haul debris through patient-care areas without prior approval of the Resident Engineer and the Medical Center. When, approved, debris shall be hauled in enclosed dust proof containers or wrapped in plastic and sealed with duct tape. No sharp objects should be allowed to cut through the plastic. Wipe down the exterior of the containers with a damp rag to remove dust. All equipment, tools, material, etc. transported through occupied areas shall be made free from dust and moisture by vacuuming and wipe down.
  - 6. There shall be no standing water during construction. This includes water in equipment drip pans and open containers within the construction areas. All accidental spills must be cleaned up and dried within 12 hours. Remove and dispose of porous materials that remain damp for more than 72 hours.
  - 7. At completion, remove construction barriers and ceiling protection carefully, outside of normal work hours. Vacuum and clean all surfaces free of dust after the removal.
- I. Final Cleanup:
  - 1. Upon completion of project, or as work progresses, remove all construction debris from above ceiling, vertical shafts and utility chases that have been part of the construction.
  - 2. Perform HEPA vacuum cleaning of all surfaces in the construction area. This includes walls, ceilings, cabinets, furniture (built-in or free standing), partitions, flooring, etc.
  - 3. All new air ducts shall be cleaned prior to final inspection.
- J. Exterior Construction
  - 1. Contractor shall verify that dust will not be introduced into the medical center through intake vents or building openings. HEPA filtration on intake vents is required where dust may be introduced.
  - 2. Dust created from disturbance of soil such as from vehicle movement will be wetted with use of a water truck as necessary
  - 3. All cutting, drilling, grinding, sanding, or disturbance of materials shall be accomplished with tools equipped with either local exhaust ventilation (i.e. vacuum systems) or wet suppression controls.

### **1.13 TUBERCULOSIS SCREENING**

- A. Contractor shall provide written certification that all contract employees assigned to the work site have had a pre-placement tuberculin screening within 90 days prior to assignment to the worksite and been found have negative TB screening reactions. Contractors shall be required to show documentation of negative TB screening reactions for any additional workers who are

added after the 90-day requirement before they will be allowed to work on the work site.

NOTE: This can be the Center for Disease Control (CDC) and Prevention and two-step skin testing or a Food and Drug Administration (FDA)-approved blood test.

1. Contract employees manifesting positive screening reactions to the tuberculin shall be examined according to current CDC guidelines prior to working on VHA property.
2. Subsequently, if the employee is found without evidence of active (infectious) pulmonary TB, a statement documenting examination by a physician shall be on file with the employer (construction contractor), noting that the employee with a positive tuberculin screening test is without evidence of active (infectious) pulmonary TB.
3. If the employee is found with evidence of active (infectious) pulmonary TB, the employee shall require treatment with a subsequent statement to the fact on file with the employer before being allowed to return to work on VHA property.

#### **1.14 FIRE SAFETY**

- A. Fire Safety Plan: Establish and maintain a site-specific 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 Contracting Officer Representative for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES. This plan may be an element of the Accident Prevention Plan.
- B. 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.
- C. Separate temporary facilities, such as trailers, storage sheds, and dumpsters, from existing buildings and new construction by distances in accordance with NFPA 241. For small facilities with less than 6 m (20 feet) exposing overall length, separate by 3m (10 feet).
- D. Temporary Construction Partitions:
  1. Install and maintain temporary construction partitions to provide smoke-tight separations between construction areas and adjoining areas. Construct partitions of gypsum board or treated plywood (flame spread rating of 25 or less in accordance with ASTM E84) on both sides of fire-retardant treated wood or metal steel studs. Extend the partitions through suspended ceilings to floor slab deck or roof. Seal joints and penetrations. At door openings, install Class C, ¾ hour fire/smoke rated doors with self-closing devices.
  2. Install one-hour fire-rated temporary construction partitions as shown on drawings to maintain integrity of existing exit stair enclosures, exit passageways, fire-rated enclosures of hazardous areas, horizontal exits, smoke barriers, vertical shafts and openings enclosures.
  3. Close openings in smoke barriers and fire-rated construction to maintain fire ratings. Seal penetrations with listed through-penetration firestop materials in accordance with Section 07 84 00, FIRESTOPPING.
- E. Temporary Heating and Electrical: Install, use and maintain installations in accordance with 29 CFR 1926, NFPA 241 and NFPA 70.
- F. Means of Egress: Do not block exiting for occupied buildings, including paths from exits to roads. Minimize disruptions and coordinate with Contracting Officer Representative.
- G. Egress Routes for Construction Workers: Maintain free and unobstructed egress. Inspect daily. Report findings and corrective actions weekly to Contracting Officer Representative.
- H. Fire Extinguishers: Provide and maintain extinguishers in construction areas and temporary storage areas in accordance with 29 CFR 1926, NFPA 241 and NFPA 10.
- I. Flammable and Combustible Liquids: Store, dispense and use liquids in accordance with 29 CFR 1926, NFPA 241 and NFPA 30.

- J. Sprinklers: Install, test and activate new automatic sprinklers prior to removing existing sprinklers.
- K. Existing Fire Protection: Do not impair automatic sprinklers, smoke and heat detection, and fire alarm systems, except for portions immediately under construction, and temporarily for connections. Provide fire watch for impairments more than 4 hours in a 24-hour period. Request interruptions in accordance with Article, OPERATIONS AND STORAGE AREAS, and coordinate with Contracting Officer Representative. All existing or temporary fire protection systems (fire alarms, sprinklers) located in construction areas shall be tested as coordinated with the medical center. Parameters for the testing and results of any tests performed shall be recorded by the medical center and copies provided to the Resident Engineer.
- L. Smoke Detectors: Prevent accidental operation. Remove temporary covers at end of work operations each day. Coordinate with Contracting Officer Representative.
- M. Hot Work: Perform and safeguard hot work operations in accordance with NFPA 241 and NFPA 51B. Coordinate with Contracting Officer Representative for permits m at least 72 hours in advance .
- N. Fire Hazard Prevention and Safety Inspections: Inspect entire construction areas weekly. Coordinate with, and report findings and corrective actions weekly to Contracting Officer Representative.
- O. Smoking: Smoking is prohibited in and adjacent to construction areas inside existing buildings and additions under construction. In separate and detached buildings under construction, smoking is prohibited except in designated smoking rest areas.
- P. Dispose of waste and debris in accordance with NFPA 241. Remove from buildings daily.
- Q. If required, submit documentation to the COR that personnel have been trained in the fire safety aspects of working in areas with impaired structural or compartmentalization features.

#### **1.15 ELECTRICAL**

- A. All electrical work shall comply with NFPA 70 (NEC), NFPA 70B, NFPA 70E, 29 CFR Part 1910 Subpart J – General Environmental Controls, 29 CFR Part 1910 Subpart S – Electrical, and 29 CFR 1926 Subpart K in addition to other references required by contract.
- B. All qualified persons performing electrical work under this contract shall be licensed journeyman or master electricians. All apprentice electricians performing under this contract shall be deemed unqualified persons unless they are working under the immediate supervision of a licensed electrician or master electrician.
- C. All electrical work will be accomplished de-energized and in the Electrically Safe Work Condition (refer to NFPA 70E for Work Involving Electrical Hazards, including Exemptions to Work Permit). Any Contractor, subcontractor or temporary worker who fails to fully comply with this requirement is subject to immediate termination in accordance with FAR clause 52.236-5(c). Only in rare circumstance where achieving an electrically safe work condition prior to beginning work would increase or cause additional hazards or is infeasible due to equipment design or operational limitations is energized work permitted. The Contracting Officer Representative with approval of the Medical Center Director will make the determination if the circumstances would meet the exception outlined above. An AHA and permit specific to energized work activities will be developed, reviewed, and accepted by the VA prior to the start of that activity.
  - 1. Development of a Hazardous Electrical Energy Control Procedure is required prior to de-energization. A single Simple Lockout/Tagout Procedure for multiple work operations can only be used for work involving qualified person(s) de-energizing one set of conductors or circuit part source. Task specific Complex Lockout/Tagout Procedures are required at all other times.
  - 2. Verification of the absence of voltage after de-energization and lockout/tagout is considered “energized electrical work” (live work) under NFPA 70E, and shall only be

- performed by qualified persons wearing appropriate shock protective (voltage rated) gloves and arc rate personal protective clothing and equipment, using Underwriters Laboratories (UL) tested and appropriately rated contact electrical testing instruments or equipment appropriate for the environment in which they will be used.
3. Personal Protective Equipment (PPE) and electrical testing instruments will be readily available for inspection by the The Contracting Officer Representative.
- D. Before beginning any electrical work, an Activity Hazard Analysis (AHA) will be conducted to include Shock Hazard and Arc Flash Hazard analyses (NFPA Tables can be used only as a last alternative and it is strongly suggested a full Arc Flash Hazard Analyses be conducted). Work shall not begin until the AHA for the work activity and permit for energized work has been reviewed and accepted by the Contracting Officer Representative and discussed with all engaged in the activity, including the Contractor, subcontractor(s), and Government on-site representatives at preparatory and initial control phase meetings.
- E. Ground-fault circuit interrupters. GFCI protection shall be provided where an employee is operating or using cord- and plug-connected tools related to construction activity supplied by 125-volt, 15-, 20-, or 30- ampere circuits. Where employees operate or use equipment supplied by greater than 125-volt, 15-, 20-, or 30- ampere circuits, GFCI protection or an assured equipment grounding conductor program shall be implemented in accordance with NFPA 70E - 2015, Chapter 1, Article 110.4(C)(2)..

#### **1.16 FALL PROTECTION**

- A. The fall protection (FP) threshold height requirement is 6 ft (1.8 m) for ALL WORK, unless specified differently or the OSHA 29 CFR 1926 requirements are more stringent, to include steel erection activities, systems-engineered activities (prefabricated) metal buildings, residential (wood) construction and scaffolding work.
1. The use of a Safety Monitoring System (SMS) as a fall protection method is prohibited.
  2. The use of Controlled Access Zone (CAZ) as a fall protection method is prohibited.
  3. A Warning Line System (WLS) may ONLY be used on floors or flat or low-sloped roofs (between 0 - 18.4 degrees or 4:12 slope) and shall be erected around all sides of the work area (See 29 CFR 1926.502(f) for construction of WLS requirements). Working within the WLS does not require FP. No worker shall be allowed in the area between the roof or floor edge and the WLS without FP. FP is required when working outside the WLS.
  4. Fall protection while using a ladder will be governed by the OSHA requirements.

#### **1.17 SCAFFOLDS AND OTHER WORK PLATFORMS**

- A. All scaffolds and other work platforms construction activities shall comply with 29 CFR 1926 Subpart L.
- B. The fall protection (FP) threshold height requirement is 6 ft (1.8 m) as stated in Section 1.16.
- C. The following hierarchy and prohibitions shall be followed in selecting appropriate work platforms.
1. Scaffolds, platforms, or temporary floors shall be provided for all work except that can be performed safely from the ground or similar footing.
  2. Ladders less than 20 feet may be used as work platforms only when use of small hand tools or handling of light material is involved.
  3. Ladder jacks, lean-to, and prop-scaffolds are prohibited.
  4. Emergency descent devices shall not be used as working platforms.
- D. Contractors shall use a scaffold tagging system in which all scaffolds are tagged by the Competent Person. Tags shall be color-coded: green indicates the scaffold has been inspected and is safe to use; red indicates the scaffold is unsafe to use. Tags shall be readily visible, made of materials that will withstand the environment in which they are used, be legible and shall include:

1. The Competent Person's name and signature.
2. Dates of initial and last inspections.

E. Mast Climbing work platforms: When access ladders, including masts designed as ladders, exceed 20 ft (6 m) in height, positive fall protection shall be used.

#### **1.18 EXCAVATION AND TRENCHES**

- A. All excavation and trenching work shall comply with 29 CFR 1926 Subpart P. Excavations less than 5 feet in depth require evaluation by the contractor's "Competent Person" (CP) for determination of the necessity of an excavation protective system where kneeling, laying in, or stooping within the excavation is required.
- B. All excavations and trenches 24 inches in depth or greater shall require a written trenching and excavation permit (NOTE – some States and other local jurisdictions require separate state/jurisdiction-issued excavation permits). The permit shall have two sections, one section will be completed prior to digging or drilling and the other will be completed prior to personnel entering the excavations greater than 5 feet in depth. Each section of the permit shall be provided to the COR prior to proceeding with digging or drilling and prior to proceeding with entering the excavation. After completion of the work and prior to opening a new section of an excavation, the permit shall be closed out and provided to the COR. The permit shall be maintained onsite and the first section of the permit shall include the following:
1. Estimated start time & stop time
  2. Specific location and nature of the work.
  3. Indication of the contractor's "Competent Person" (CP) in excavation safety with qualifications and signature. Formal course in excavation safety is required by the contractor's CP.
  4. Indication of whether soil or concrete removal to an offsite location is necessary.
  5. Indication of whether soil samples are required to determine soil contamination.
  6. Indication of coordination with local authority (i.e. "One Call") or contractor's effort to determine utility location with search and survey equipment.
  7. Indication of review of site drawings for proximity of utilities to digging/drilling.
- C. The second section of the permit for excavations greater than five feet in depth shall include the following:
1. Determination of OSHA classification of soil. Soil samples will be from freshly dug soil with samples taken from different soil type layers as necessary and placed at a safe distance from the excavation by the excavating equipment. A pocket penetrometer will be utilized in determination of the unconfined compression strength of the soil for comparison against OSHA table (Less than 0.5 Tons/FT<sup>2</sup> – Type C, 0.5 Tons/FT<sup>2</sup> to 1.5 Tons/FT<sup>2</sup> – Type B, greater than 1.5 Tons/FT<sup>2</sup> – Type A without condition to reduce to Type B).
  2. Indication of selected protective system (sloping/benching, shoring, shielding). When soil classification is identified as "Type A" or "Solid Rock", only shoring or shielding or Professional Engineer designed systems can be used for protection. A Sloping/Benching system may only be used when classifying the soil as Type B or Type C. Refer to Appendix B of 29 CFR 1926, Subpart P for further information on protective systems designs.
  3. Indication of the spoil pile being stored at least 2 feet from the edge of the excavation and safe access being provided within 25 feet of the workers.
  4. Indication of assessment for a potential toxic, explosive, or oxygen deficient atmosphere where oxygen deficiency (atmospheres containing less than 19.5 percent oxygen) or a hazardous atmosphere exists or could reasonably be expected to exist. Internal combustion engine equipment is not allowed in an excavation without providing force air ventilation to lower the concentration to below OSHA PELs, providing sufficient oxygen levels, and atmospheric testing as necessary to ensure safe levels are maintained.

- D. As required by OSHA 29 CFR 1926.651(b)(1), the estimated location of utility installations, such as sewer, telephone, fuel, electric, water lines, or any other underground installations that reasonably may be expected to be encountered during excavation work, shall be determined prior to opening an excavation.
  - 1. The planned dig site will be outlined/marked in white prior to locating the utilities.
  - 2. Used of the American Public Works Association Uniform Color Code is required for the marking of the proposed excavation and located utilities.
  - 3. 811 will be called two business days before digging on all local or State lands and public Right-of Ways.
  - 4. Digging will not commence until all known utilities are marked.
  - 5. Utility markings will be maintained
- E. Excavations will be hand dug or excavated by other similar safe and acceptable means as excavation operations approach within 3 feet of identified underground utilities. Exploratory bar or other detection equipment will be utilized as necessary to further identify the location of underground utilities.
- F. Excavations greater than 20 feet in depth require a Professional Engineer designed excavation protective system.

#### **1.19 CRANES**

- A. All crane work shall comply with 29 CFR 1926 Subpart CC.
- B. Prior to operating a crane, the operator must be licensed, qualified or certified to operate the crane. Thus, all the provisions contained with Subpart CC are effective and there is no "Phase In" date.
- C. A detailed lift plan for all lifts shall be submitted to the COR 14 days prior to the scheduled lift complete with route for truck carrying load, crane load analysis, siting of crane and path of swing and all other elements of a critical lift plan where the lift meets the definition of a critical lift. Critical lifts require a more comprehensive lift plan to minimize the potential of crane failure and/or catastrophic loss. The plan must be reviewed and accepted by the General Contractor before being submitted to the VA for review. The lift will not be allowed to proceed without prior acceptance of this document.
- D. Crane operators shall not carry loads
  - 1. over the general public or VAMC personnel
  - 2. over any occupied building unless
    - a. the top two floors are vacated
    - b. or overhead protection with a design live load of 300 psf is provided

#### **1.20 CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT)**

- A. All installation, maintenance, and servicing of equipment or machinery shall comply with 29 CFR 1910.147 except for specifically referenced operations in 29 CFR 1926 such as concrete & masonry equipment (1926.702(j)), heavy machinery & equipment (1926.600(a)(3)(i)), and process safety management of highly hazardous chemicals (1926.64). Control of hazardous electrical energy during the installation, maintenance, or servicing of electrical equipment shall comply with Section 1.15 to include NFPA 70E and other VA specific requirements discussed in the section.

#### **1.21 CONFINED SPACE ENTRY**

- A. All confined space entry shall comply with 29 CFR 1926, Subpart AA except for specifically referenced operations in 29 CFR 1926 such as excavations/trenches (1926.651(g)).
- B. A site-specific Confined Space Entry Plan (including permitting process) shall be developed and submitted to the COR.

**1.22 WELDING AND CUTTING**

- A. As specified in section 1.14, Hot Work: Perform and safeguard hot work operations in accordance with NFPA 241 and NFPA 51B. Coordinate with COR. Obtain permits from COR at least 72 hours in advance .

**1.23 LADDERS**

- A. All Ladder use shall comply with 29 CFR 1926 Subpart X.
- B. All portable ladders shall be of sufficient length and shall be placed so that workers will not stretch or assume a hazardous position.
- C. Manufacturer safety labels shall be in place on ladders
- D. Step Ladders shall not be used in the closed position
- E. Top steps or cap of step ladders shall not be used as a step
- F. Portable ladders, used as temporary access, shall extend at least 3 ft (0.9 m) above the upper landing surface.
  - 1. When a 3 ft (0.9-m) extension is not possible, a grasping device (such as a grab rail) shall be provided to assist workers in mounting and dismounting the ladder.
  - 2. In no case shall the length of the ladder be such that ladder deflection under a load would, by itself, cause the ladder to slip from its support.
- G. Ladders shall be inspected for visible defects on a daily basis and after any occurrence that could affect their safe use. Broken or damaged ladders shall be immediately tagged "DO NOT USE," or with similar wording, and withdrawn from service until restored to a condition meeting their original design.

**1.24 FLOOR & WALL OPENINGS**

- A. All floor and wall openings shall comply with 29 CFR 1926 Subpart M.
- B. Floor and roof holes/openings are any that measure over 2 in (51 mm) in any direction of a walking/working surface which persons may trip or fall into or where objects may fall to the level below. Skylights located in floors or roofs are considered floor or roof hole/openings.
- C. All floor, roof openings or hole into which a person can accidentally walk or fall through shall be guarded either by a railing system with toe boards along all exposed sides or a load-bearing cover. When the cover is not in place, the opening or hole shall be protected by a removable guardrail system or shall be attended when the guarding system has been removed, or other fall protection system.
  - 1. Covers shall be capable of supporting, without failure, at least twice the weight of the worker, equipment and material combined.
  - 2. Covers shall be secured when installed, clearly marked with the word "HOLE", "COVER" or "Danger, Roof Opening-Do Not Remove" or color-coded or equivalent methods (e.g., red or orange "X"). Workers must be made aware of the meaning for color coding and equivalent methods.
  - 3. Roofing material, such as roofing membrane, insulation or felts, covering or partly covering openings or holes, shall be immediately cut out. No hole or opening shall be left unattended unless covered.
  - 4. Non-load-bearing skylights shall be guarded by a load-bearing skylight screen, cover, or railing system along all exposed sides.
  - 5. Workers are prohibited from standing/walking on skylights.

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**SECTION 01 35 26**

**SAFETY REQUIREMENTS**

**PART 1 - GENERAL**

**1.1 APPLICABLE PUBLICATIONS:**

- A. Latest publications listed below form part of this Article to extent referenced. Publications are referenced in text by basic designations only.
- B. American Society of Safety Engineers (ASSE):
  - A10.1-2011.....Pre-Project & Pre-Task Safety and Health Planning
  - A10.34-2012.....Protection of the Public on or Adjacent to Construction Sites
  - A10.38-2013.....Basic Elements of an Employer’s Program to Provide a Safe and Healthful Work Environment American National Standard Construction and Demolition Operations
- C. American Society for Testing and Materials (ASTM):
  - E84-2013.....Surface Burning Characteristics of Building Materials
- D. The Facilities Guidelines Institute (FGI):
  - FGI Guidelines-2018 Guidelines for Design and Construction of Healthcare Facilities
- E. National Fire Protection Association (NFPA):
  - 10-2018 ..... Standard for Portable Fire Extinguishers
  - 30-2018 ..... Flammable and Combustible Liquids Code
  - 51B-2019..... Standard for Fire Prevention During Welding, Cutting and Other Hot Work
  - 70-2020 ..... National Electrical Code
  - 70B-2019..... Recommended Practice for Electrical Equipment Maintenance
  - 70E-2018 ..... Standard for Electrical Safety in the Workplace
  - 99-2018 ..... Health Care Facilities Code
  - 241-2019 ..... Standard for Safeguarding Construction, Alteration, and Demolition Operations
- F. The Joint Commission (TJC)
  - TJC Manual ..... Comprehensive Accreditation and Certification Manual
- G. U.S. Nuclear Regulatory Commission
  - 10 CFR 20 ..... Standards for Protection Against Radiation
- H. U.S. Occupational Safety and Health Administration (OSHA):
  - 29 CFR 1910 ..... Safety and Health Regulations for General Industry
  - 29 CFR 1926 ..... Safety and Health Regulations for Construction Industry
- I. VHA Directive 7712-17
- J. VHA Directive 7715-17

**1.2 DEFINITIONS:**

- A. Critical Lift. A lift with the hoisted load exceeding 75% of the crane’s maximum capacity; lifts made out of the view of the operator (blind picks); lifts involving two or more cranes; personnel being hoisted; and special hazards such as lifts over occupied facilities, loads lifted close to

power-lines, and lifts in high winds or where other adverse environmental conditions exist; and any lift which the crane operator believes is critical.

- B. OSHA "Competent Person" (CP). One who is capable of identifying existing and predictable hazards in the surroundings and working conditions which are unsanitary, hazardous or dangerous to employees, and who has the authorization to take prompt corrective measures to eliminate them (see 29 CFR 1926.32(f)).
- C. "Qualified Person" means one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience, has successfully demonstrated his ability to solve or resolve problems relating to the subject matter, the work, or the project.
- D. High Visibility Accident. Any mishap which may generate publicity or high visibility.
- E. Accident/Incident Criticality Categories:
  - 1. No impact – near miss incidents that should be investigated but are not required to be reported to the VA.
  - 2. Minor incident/impact – incidents that require first aid or result in minor equipment damage (less than \$5000). These incidents must be investigated but are not required to be reported to the VA;
  - 3. Moderate incident/impact – Any work-related injury or illness that results in:
    - a. Days away from work (any time lost after day of injury/illness onset);
    - b. Restricted work;
    - c. Transfer to another job;
    - d. Medical treatment beyond first aid;
    - e. Loss of consciousness;
  - 4. A significant injury or illness diagnosed by a physician or other licensed health care professional, even if it did not result in (1) through (5) above or,
- F. These incidents must be investigated and are required to be reported to the VA;
  - 1. Major incident/impact – Any mishap that leads to fatalities, hospitalizations, amputations, and losses of an eye as a result of contractors' activities. Or any incident which leads to major property damage (greater than \$20,000) and/or may generate publicity or high visibility. These incidents must be investigated and are required to be reported to the VA as soon as practical, but not later than 2 hours after the incident.
- G. Medical Treatment. 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.

### **1.3 REGULATORY REQUIREMENTS:**

- A. In addition to the detailed requirements included in the provisions of this contract, comply with 29 CFR 1926, comply with 29 CFR 1910 as incorporated by reference within 29 CFR 1926, comply with ASSE A10.34, and all applicable federal, state, and local laws, ordinances, criteria, rules and regulations New York. Submit matters of interpretation of standards 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 except with specific approval and acceptance by the Contracting Officer Representative .

### **1.4 ACCIDENT PREVENTION PLAN (APP):**

- A. The APP (aka Construction Safety & Health Plan) shall interface with the Contractor's overall safety and health program. Include any portions of the Contractor's overall safety and health program referenced in the APP in the applicable APP element and ensure it is site-specific. The Government considers the Prime Contractor to be the "controlling authority" for all worksite safety and health of each subcontractor(s). 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.

1. The APP shall be prepared as follows:
  - a. Written in English by a qualified person who is employed by the Prime Contractor articulating the specific work and hazards pertaining to the contract (model language can be found in ASSE A10.33). Specifically articulating the safety requirements found within these VA contract safety specifications.
  - b. Address both the Prime Contractors and the subcontractors work operations.
  - c. State measures to be taken to control hazards associated with materials, services, or equipment provided by suppliers.
  - d. Address all the elements/sub-elements and in order as follows:
    - 1) SIGNATURE SHEET. Title, signature, and phone number of the following:
      - a) Plan preparer (Qualified Person such as corporate safety staff person or contracted Certified Safety Professional with construction safety experience);
      - b) Plan approver (company/corporate officers authorized to obligate the company);
      - c) Plan concurrence (e.g., Chief of Operations, Corporate Chief of Safety, Corporate Industrial Hygienist, project manager or superintendent, project safety professional). Provide concurrence of other applicable corporate and project personnel (Contractor).
    - 2) BACKGROUND INFORMATION. List the following:
      - a) Contractor.
      - b) Contract number.
      - c) Project name;
      - d) Brief project description, description of work to be performed, and location; phases of work anticipated (these will require an AHA).
    - 3) STATEMENT OF SAFETY AND HEALTH POLICY. Provide a copy of current corporate/company Safety and Health Policy Statement, detailing commitment to providing a safe and healthful workplace for all employees. The Contractor's written safety program goals, objectives, and accident experience goals for this contract should be provided.
    - 4) RESPONSIBILITIES AND LINES OF AUTHORITIES. Provide the following:
      - a) A statement of the employer's ultimate responsibility for the implementation of his SOH program;
      - b) Identification and accountability of personnel responsible for safety at both corporate and project level. Contracts specifically requiring safety or industrial hygiene personnel shall include a copy of their resumes.
      - c) The names of Competent and/or Qualified Person(s) and proof of competency/qualification to meet specific OSHA Competent/Qualified Person(s) requirements must be attached.;
      - d) Requirements that no work shall be performed unless a designated competent person is present on the job site;
      - e) Requirements for pre-task Activity Hazard Analysis (AHAs);
      - f) Lines of authority;
      - g) Policies and procedures regarding noncompliance with safety requirements (to include disciplinary actions for violation of safety requirements) should be identified;
    - 5) SUBCONTRACTORS AND SUPPLIERS. If applicable, provide procedures for coordinating SOH activities with other employers on the job site:
      - a) Identification of subcontractors and suppliers (if known
      - b) Safety responsibilities of subcontractors and suppliers.
    - 6) TRAINING.

- a) Site-specific SOH orientation training at the time of initial hire or assignment to the project for every employee before working on the project site is required.
  - b) Mandatory training and certifications that are applicable to this project (e.g., explosive actuated tools, crane operator, rigger, crane signal person, fall protection, electrical lockout/NFPA 70E, machine/equipment lockout, confined space, etc....) and any requirements for periodic retraining/recertification are required.
  - c) 3) Procedures for ongoing safety and health training for supervisors and employees shall be established to address changes in site hazards/conditions.
  - d) 4) OSHA 10-hour training is required for all workers on site and the OSHA 30-hour training is required for Trade Competent Persons (CPs)
- 7) SAFETY AND HEALTH INSPECTIONS.
- a) Specific assignment of responsibilities for a minimum daily job site safety and health inspection during periods of work activity: Who will conduct (e.g., "Site Safety and Health CP"), proof of inspector's training/qualifications, when inspections will be conducted, procedures for documentation, deficiency tracking system, and follow-up procedures.
  - b) Any external inspections/certifications that may be required (e.g., contracted CSP or CSHT)
- 8) ACCIDENT/INCIDENT INVESTIGATION & REPORTING. The Contractor shall conduct mishap investigations of all Moderate and Major as well as all High Visibility Incidents. The APP shall include accident/incident investigation procedure and identify person(s) responsible to provide the following to the Contracting Officer Representative:
- a) Exposure data (man-hours worked);
  - b) Accident
  - c) Project site injury and illness logs.
- 9) PLANS (PROGRAMS, PROCEDURES) REQUIRED. Based on a risk assessment of contracted activities and on mandatory OSHA compliance programs, the Contractor shall address all applicable occupational, patient, and public safety risks in site-specific compliance and accident prevention plans. These Plans shall include but are not be limited to procedures for addressing the risks associates with the following:
- a) Emergency response;
  - b) Contingency for severe weather;
  - c) Fire Prevention;
  - d) Medical Support;
  - e) Posting of emergency telephone numbers;
  - f) Prevention of alcohol and drug abuse;
  - g) Site sanitation(housekeeping, drinking water, toilets);
  - h) Night operations and lighting;
  - i) Hazard communication program;
  - j) Welding/Cutting "Hot" work.
  - k) Electrical Safe Work Practices (Electrical LOTO/NFPA 70E);
  - l) General Electrical Safety;
  - m) Hazardous energy control (Machine LOTO);
  - n) Site-Specific Fall Protection & Prevention;
  - o) Excavation/trenching;
  - p) Asbestos abatement;
  - q) Lead abatement;
  - r) Crane Critical lift;

Safety Requirements

- s) Respiratory protection;
  - t) Health hazard control program;
  - u) Radiation Safety Program;
  - v) Abrasive blasting;
  - w) Heat/Cold Stress Monitoring;
  - x) Crystalline Silica Monitoring (Assessment);
  - y) Demolition plan (to include engineering survey);
  - z) Formwork and shoring erection and removal;
  - aa) Concrete;
  - bb) Public (Mandatory compliance with ANSI/ASSE A10.34-2012).
- B. Submit the APP to the Contracting Officer Representative for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES 21 calendar days prior to the date of the preconstruction conference for acceptance. Work cannot proceed without an accepted APP.
- C. Once accepted by the Contracting Officer Representative, the APP and attachments will be enforced as part of the contract. Disregarding the provisions of this contract or the accepted APP will be cause for stopping of work, at the discretion of the Contracting Officer in accordance with FAR Clause 52.236-13, *Accident Prevention*, until the matter has been rectified.
- D. Once work begins, changes to the accepted APP shall be made with the knowledge and concurrence of the Contracting Officer Representative. 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/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 and the environment.

#### 1.5 ACTIVITY HAZARD ANALYSES (AHAS):

- A. AHAs are also known as Job Hazard Analyses, Job Safety Analyses, and Activity Safety Analyses. Before beginning each work activity involving a type of work presenting hazards not experienced in previous project operations or where a new work crew or sub-contractor is to perform the work, the Contractor(s) performing that work activity shall prepare an AHA (Example electronic AHA forms can be found on the US Army Corps of Engineers web site)
- B. AHAs shall define the activities being performed and identify the work sequences, the specific anticipated hazards, site conditions, equipment, materials, and the control measures to be implemented to eliminate or reduce each hazard to an acceptable level of risk.
- C. Work shall not begin until the AHA for the work activity has been accepted by the Contracting Officer Representative and discussed with all engaged in the activity, including the Contractor, subcontractor(s), and Government on-site representatives at preparatory and initial control phase meetings.
1. The names of the Competent/Qualified Person(s) required for a particular activity (for example, excavations, scaffolding, fall protection, other activities as specified by OSHA and/or other State and Local agencies) shall be identified and included in the AHA. Certification of their competency/qualification shall be submitted to the Government Designated Authority (GDA) for acceptance prior to the start of that work activity.
  2. The AHA shall be reviewed and modified as necessary to address changing site conditions, operations, or change of competent/qualified person(s).
    - a. If more than one Competent/Qualified Person is used on the AHA activity, a list of names shall be submitted as an attachment to the AHA. Those listed must be Competent/Qualified for the type of work involved in the AHA and familiar with current site safety issues.

- b. If a new Competent/Qualified Person (not on the original list) is added, the list shall be updated (an administrative action not requiring an updated AHA). The new person shall acknowledge in writing that he or she has reviewed the AHA and is familiar with current site safety issues.
3. Submit AHAs to the Contracting Officer Representative for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES for review at least 21 calendar days prior to the start of each phase. Subsequent AHAs as shall be formatted as amendments to the APP. The analysis should be used during daily inspections to ensure the implementation and effectiveness of the activity's safety and health controls.
4. The AHA list will be reviewed periodically (at least monthly) at the Contractor supervisory safety meeting and updated as necessary when procedures, scheduling, or hazards change.
5. Develop the activity hazard analyses using the project schedule as the basis for the activities performed. All activities listed on the project schedule will require an AHA. The AHAs will be developed by the contractor, supplier, or subcontractor and provided to the prime contractor for review and approval and then submitted to the Contracting Officer Representative.

#### **1.6 PRECONSTRUCTION CONFERENCE:**

- A. Contractor representatives who have a responsibility or significant role in implementation of the accident prevention program, as required by 29 CFR 1926.20(b)(1), on the project shall attend the preconstruction conference to gain a mutual understanding of its implementation. This includes the project superintendent, subcontractor superintendents, and any other assigned safety and health professionals.
- 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's representative as to which phases will require an analysis. In addition, establish a schedule for the preparation, submittal, review, and acceptance of AHAs to preclude project delays.
- C. Deficiencies in the submitted APP will be brought to the attention of the Contractor within 14 days of submittal, and the Contractor shall revise the plan to correct deficiencies and re-submit it for acceptance. Do not begin work until there is an accepted APP.

#### **1.7 "SITE SAFETY AND HEALTH OFFICER" (SSHO) AND "COMPETENT PERSON" (CP):**

- A. The Prime Contractor shall designate a minimum of one SSHO at each project site that will be identified as the SSHO to administer the Contractor's safety program and government-accepted Accident Prevention Plan. Each subcontractor shall designate a minimum of one CP in compliance with 29 CFR 1926.20 (b)(2) that will be identified as a CP to administer their individual safety programs.
- B. Further, all specialized Competent Persons for the work crews will be supplied by the respective contractor as required by 29 CFR 1926 (i.e. Asbestos, Electrical, Cranes, & Derricks, Demolition, Fall Protection, Fire Safety/Life Safety, Ladder, Rigging, Scaffolds, and Trenches/Excavations).
- C. These Competent Persons can have collateral duties as the subcontractor's superintendent and/or work crew lead persons as well as fill more than one specialized CP role (i.e. Asbestos, Electrical, Cranes, & Derricks, Demolition, Fall Protection, Fire Safety/Life Safety, Ladder, Rigging, Scaffolds, and Trenches/Excavations). However, the SSHO has be a separate qualified individual from the Prime Contractor's Superintendent and/or Quality Control Manager with duties only as the SSHO.

- D. The SSHO or an equally-qualified Designated Representative/alternate will maintain a presence on the site during construction operations in accordance with FAR Clause 52.236-6: *Superintendence by the Contractor*. CPs will maintain presence during their construction activities in accordance with above mentioned clause. A listing of the designated SSHO and all known CPs shall be submitted prior to the start of work as part of the APP with the training documentation and/or AHA as listed in Section 1.8 below.
- E. The repeated presence of uncontrolled hazards during a contractor's work operations will result in the designated CP as being deemed incompetent and result in the required removal of the employee in accordance with FAR Clause 52.236-5: Material and Workmanship, Paragraph (c).

**1.8 TRAINING:**

- A. The designated Prime Contractor SSHO must meet the requirements of all applicable OSHA standards and be capable (through training, experience, and qualifications) of ensuring that the requirements of 29 CFR 1926.16 and other appropriate Federal, State and local requirements are met for the project. As a minimum the SSHO must have completed the OSHA 30-hour Construction Safety class and have five (5) years of construction industry safety experience or three (3) years if he/she possesses a Certified Safety Professional (CSP) or certified Construction Safety and Health Technician (CSHT) certification or have a safety and health degree from an accredited university or college.
- B. All designated CPs shall have completed the OSHA 30-hour Construction Safety course within the past 5 years.
- C. In addition to the OSHA 30 Hour Construction Safety Course, all CPs with high hazard work operations such as operations involving asbestos, electrical, cranes, demolition, work at heights/fall protection, fire safety/life safety, ladder, rigging, scaffolds, and trenches/excavations shall have a specialized formal course in the hazard recognition & control associated with those high hazard work operations. Documented "repeat" deficiencies in the execution of safety requirements will require retaking the requisite formal course.
- D. All other construction workers shall have the OSHA 10-hour Construction Safety Outreach course and any necessary safety training to be able to identify hazards within their work environment.
- E. Submit training records associated with the above training requirements to the Contracting Officer Representative for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES 21calendar days prior to the date of the preconstruction conference for acceptance.
- F. Prior to any worker for the contractor or subcontractors beginning work, they shall undergo a safety briefing provided by the SSHO or his/her designated representative. As a minimum, this briefing shall include information on the site-specific hazards, construction limits, VAMC safety guidelines, means of egress, break areas, work hours, locations of restrooms, use of VAMC equipment, emergency procedures, accident reporting etc... Documentation shall be provided to the Resident Engineer that individuals have undergone contractor's safety briefing.
- G. Ongoing safety training will be accomplished in the form of weekly documented safety meeting.

**1.9 INSPECTIONS:**

- A. The SSHO shall conduct frequent and regular safety inspections (daily) of the site and each of the subcontractors CPs shall conduct frequent and regular safety inspections (daily) of their work operations as required by 29 CFR 1926.20(b)(2). Each week, the SSHO shall conduct a formal documented inspection of the entire construction areas with the subcontractors' "Trade Safety and Health CPs" present in their work areas. Coordinate with, and report findings and corrective actions weekly to Contracting Officer Representative.
- B. A Certified Safety Professional (CSP) with specialized knowledge in construction safety or a certified Construction Safety and Health Technician (CSHT) shall randomly conduct a monthly

site safety inspection. The CSP or CSHT can be a corporate safety professional or independently contracted. The CSP or CSHT will provide their certificate number on the required report for verification as necessary.

1. Results of the inspection will be documented with tracking of the identified hazards to abatement.
2. The Contracting Officer Representative will be notified immediately prior to start of the inspection and invited to accompany the inspection.
3. Identified hazard and controls will be discussed to come to a mutual understanding to ensure abatement and prevent future reoccurrence.
4. A report of the inspection findings with status of abatement will be provided to the Contracting Officer Representative within one week of the onsite inspection.

#### **1.10 ACCIDENTS, OSHA 300 LOGS, AND MAN-HOURS:**

- A. The prime contractor shall establish and maintain an accident reporting, recordkeeping, and analysis system to track and analyze all injuries and illnesses, high visibility incidents, and accidental property damage (both government and contractor) that occur on site. Notify the Contracting Officer Representative as soon as practical, but no more than four hours after any accident meeting the definition of a Moderate or Major incidents, High Visibility Incidents, , or any weight handling and hoisting equipment accident. 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 (to include type of construction equipment used, PPE used, etc.). Preserve the conditions and evidence on the accident site until the Contracting Officer Representative determine whether a government investigation will be conducted.
- B. Conduct an accident investigation for all Minor, Moderate and Major incidents as defined in paragraph DEFINITIONS, and property damage accidents resulting in at least \$20,000 in damages, to establish the root cause(s) of the accident. Complete the VA Form 2162 (or equivalent) , and provide the report to the Contracting Officer Representative within 5 calendar days of the accident. The Contracting Officer Representative will provide copies of any required or special forms.
- C. A summation of all man-hours worked by the contractor and associated sub-contractors for each month will be reported to the Contracting Officer Representative monthly.
- D. A summation of all Minor, Moderate, and Major incidents experienced on site by the contractor and associated sub-contractors for each month will be provided to the Contracting Officer Representative monthly. The contractor and associated sub-contractors' OSHA 300 logs will be made available to the Contracting Officer Representative as requested.

#### **1.11 PERSONAL PROTECTIVE EQUIPMENT (PPE):**

- A. PPE is governed in all areas by the nature of the work the employee is performing. For example, specific PPE required for performing work on electrical equipment is identified in NFPA 70E, Standard for Electrical Safety in the Workplace.
- B. Mandatory PPE includes:
  1. Hard Hats – unless written authorization is given by the Contracting Officer Representative in circumstances of work operations that have limited potential for falling object hazards such as during finishing work or minor remodeling. With authorization to relax the requirement of hard hats, if a worker becomes exposed to an overhead falling object hazard, then hard hats would be required in accordance with the OSHA regulations.
  2. Safety glasses - unless written authorization is given by the Contracting Officer Representative in circumstances of no eye hazards, appropriate safety glasses meeting the ANSI Z.87.1 standard must be worn by each person on site.

3. Appropriate Safety Shoes – based on the hazards present, safety shoes meeting the requirements of ASTM F2413-11 shall be worn by each person on site unless written authorization is given by the Contracting Officer Representative in circumstances of no foot hazards.
4. Hearing protection - Use personal hearing protection at all times in designated noise hazardous areas or when performing noise hazardous tasks.

#### 1.12 INFECTION CONTROL

- A. Infection Control is critical in all medical center facilities. Interior construction activities causing disturbance of existing dust, or creating new dust, must be conducted within ventilation-controlled areas that minimize the flow of airborne particles into patient areas. Exterior construction activities causing disturbance of soil or creates dust in some other manner must be controlled.
- B. An AHA associated with infection control will be performed by VA personnel in accordance with FGI Guidelines (i.e. Infection Control Risk Assessment (ICRA)). The ICRA procedure found on the American Society for Healthcare Engineering (ASHE) website will be utilized. Risk classifications of Class II or lower will require approval by the Contracting Officer Representative before beginning any construction work. Risk classifications of Class III or higher will require a permit before beginning any construction work. Infection Control permits will be issued by the COR. The Infection Control Permits will be posted outside the appropriate construction area. More than one permit may be issued for a construction project if the work is located in separate areas requiring separate classes. The primary project scope area for this project is: Class IV however, work outside the primary project scope area may vary. The required infection control precautions with each class are as follows:
  1. Class I requirements:
    - a. During Construction Work:
      - 1) Notify the Contracting Officer Representative
      - 2) Execute work by methods to minimize raising dust from construction operations.
      - 3) Ceiling tiles: Immediately replace a ceiling tiles displaced for visual inspection.
    - b. Upon Completion:
      - 1) Clean work area upon completion of task
      - 2) Notify the Contracting Officer Representative
  2. Class II requirements:
    - a. During Construction Work:
      - 1) Notify the Contracting Officer Representative
      - 2) Provide active means to prevent airborne dust from dispersing into atmosphere such as wet methods or tool mounted dust collectors where possible.
      - 3) Water mist work surfaces to control dust while cutting.
      - 4) Seal unused doors with duct tape.
      - 5) Block off and seal air vents.
      - 6) Remove or isolate HVAC system in areas where work is being performed.
    - b. Upon Completion:
      - 1) Wipe work surfaces with cleaner/disinfectant.
      - 2) Contain construction waste before transport in tightly covered containers.
      - 3) Wet mop and/or vacuum with HEPA filtered vacuum before leaving work area.
      - 4) Upon completion, restore HVAC system where work was performed
      - 5) Notify the Contracting Officer Representative
  3. Class III requirements:
    - a. During Construction Work:
      - 1) Obtain permit from the Contracting Officer Representative

- 2) Remove or Isolate HVAC system in area where work is being done to prevent contamination of duct system.
  - 3) Complete all critical barriers i.e. sheetrock, plywood, plastic, to seal area from non-work area or implement control cube method (cart with plastic covering and sealed connection to work site with HEPA vacuum for vacuuming prior to exit) before construction begins. Install construction barriers and ceiling protection carefully, outside of normal work hours.
  - 4) Maintain negative air pressure, 0.03 inches of water gauge, within work site utilizing HEPA equipped air filtration units and continuously monitored with a digital display, recording and alarm instrument, which must be calibrated on installation, maintained with periodic calibration and monitored by the contractor.
  - 5) HEPA units shall be provided with new filters at the beginning of the project and filters shall be periodically changed per manufacturer's recommendations.
  - 6) Contain construction waste before transport in tightly covered containers.
  - 7) Cover transport receptacles or carts. Tape covering unless solid lid.
  - b. Upon Completion:
    - 1) Do not remove barriers from work area until completed project is inspected by the Contracting Officer Representative and thoroughly cleaned by the VA Environmental Services Department.
    - 2) Remove construction barriers and ceiling protection carefully to minimize spreading of dirt and debris associated with construction, outside of normal work hours.
    - 3) Vacuum work area with HEPA filtered vacuums.
    - 4) Wet mop area with cleaner/disinfectant.
    - 5) Upon completion, restore HVAC system where work was performed.
    - 6) Return permit to the Contracting Officer Representative
4. Class IV requirements:
- a. During Construction Work:
    - 1) Obtain permit from the Contracting Officer Representative
    - 2) Isolate HVAC system in area where work is being done to prevent contamination of duct system.
    - 3) Complete all critical barriers i.e. sheetrock, plywood, plastic, to seal area from non-work area or implement control cube method (cart with plastic covering and sealed connection to work site with HEPA vacuum for vacuuming prior to exit) before construction begins. Install construction barriers and ceiling protection carefully, outside of normal work hours.
    - 4) Maintain negative air pressure, 0.03 inches of water gauge, within work site utilizing HEPA equipped air filtration units and continuously monitored with a digital display, recording and alarm instrument, which must be calibrated on installation, maintained with periodic calibration and monitored by the contractor.
    - 5) HEPA units shall be provided with new filters at the beginning of the project and filters shall be periodically changed per manufacturer's recommendations.
    - 6) Seal holes, pipes, conduits, and punctures.
    - 7) Construct anteroom and require all personnel to pass through this room so they can be vacuumed using a HEPA vacuum cleaner before leaving work site or they can wear cloth or paper coveralls that are removed each time they leave work site.
    - 8) All personnel entering work site are required to wear shoe covers. Shoe covers must be changed each time the worker exits the work area.
  - b. Upon Completion:

- 1) Do not remove barriers from work area until completed project is inspected by the Contracting Officer Representative with thorough cleaning by the VA Environmental Services Dept.
  - 2) Remove construction barriers and ceiling protection carefully to minimize spreading of dirt and debris associated with construction, outside of normal work hours.
  - 3) Contain construction waste before transport in tightly covered containers.
  - 4) Cover transport receptacles or carts. Tape covering unless solid lid.
  - 5) Vacuum work area with HEPA filtered vacuums.
  - 6) Wet mop area with cleaner/disinfectant.
  - 7) Upon completion, restore HVAC system where work was performed.
  - 8) Return permit to the Contracting Officer Representative
- C. Barriers shall be erected as required based upon classification (Class III & IV requires barriers) and shall be constructed as follows:
1. Class III and IV - closed door with masking tape applied over the frame and door is acceptable for projects that can be contained in a single room.
  2. Construction, demolition or reconstruction not capable of containment within a single room must have the following barriers erected and made presentable on hospital occupied side:
    - a. Class III & IV (where dust control is the only hazard, and an agreement is reached with the Resident Engineer and Medical Center) - Airtight plastic barrier that extends from the floor to ceiling. Seams must be sealed with duct tape to prevent dust and debris from escaping
    - b. Class III & IV - Drywall barrier erected with joints covered or sealed to prevent dust and debris from escaping.
    - c. Class III & IV - Seal all penetrations in existing barrier airtight
    - d. Class III & IV - Barriers at penetration of ceiling envelopes, chases and ceiling spaces to stop movement air and debris
    - e. Class IV only - Anteroom or double entrance openings that allow workers to remove protective clothing or vacuum off existing clothing
    - f. Class III & IV - At elevators shafts or stairways within the field of construction, overlapping flap minimum of two feet wide of polyethylene enclosures for personnel access.
- D. Products and Materials:
1. Sheet Plastic: Fire retardant polystyrene, 6-mil thickness meeting local fire codes
  2. Barrier Doors: Self Closing One-hour fire-rated solid core wood in steel frame, painted
  3. Dust proof one-hour fire-rated drywall
  4. High Efficiency Particulate Air-Equipped filtration machine rated at 95% capture of 0.3 microns including pollen, mold spores and dust particles. HEPA filters should have ASHRAE 85 or other prefilter to extend the useful life of the HEPA. Provide both primary and secondary filtrations units. Maintenance of equipment and replacement of the HEPA filters and other filters will be in accordance with manufacturer's instructions.
  5. Exhaust Hoses: Heavy duty, flexible steel reinforced; Ventilation Blower Hose
  6. Adhesive Walk-off Mats: Provide minimum size mats of 24 inches x 36 inches
  7. Disinfectant: Hospital-approved disinfectant or equivalent product
  8. Portable Ceiling Access Module
- E. Before any construction on site begins, all contractor personnel involved in the construction or renovation activity shall be educated and trained in infection prevention measures established by the medical center.
- F. A dust control program will be establish and maintained as part of the contractor's infection preventive measures in accordance with the FGI Guidelines for Design and Construction of Healthcare Facilities. Prior to start of work, prepare a plan detailing project-specific dust protection measures with associated product data, including periodic status reports, and submit

to Project Engineer and Facility CSC for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES.

- G. Medical center Infection Control personnel will monitor for airborne disease (e.g. aspergillosis) during construction. A baseline of conditions will be established by the medical center prior to the start of work and periodically during the construction stage to determine impact of construction activities on indoor air quality with safe thresholds established.
- H. In general, the following preventive measures shall be adopted during construction to keep down dust and prevent mold.
  - 1. Contractor shall verify that construction exhaust to exterior is not reintroduced to the medical center through intake vents or building openings. HEPA filtration is required where the exhaust dust may reenter the medical center.
  - 2. Exhaust hoses shall be exhausted so that dust is not reintroduced to the medical center.
  - 3. Adhesive Walk-off/Carpet Walk-off Mats shall be used at all interior transitions from the construction area to occupied medical center area. These mats shall be changed as often as required to maintain clean work areas directly outside construction area at all times.
  - 4. Vacuum and wet mop all transition areas from construction to the occupied medical center at the end of each workday. Vacuum shall utilize HEPA filtration. Maintain surrounding area frequently. Remove debris as it is created. Transport these outside the construction area in containers with tightly fitting lids.
  - 5. The contractor shall not haul debris through patient-care areas without prior approval of the Resident Engineer and the Medical Center. When, approved, debris shall be hauled in enclosed dust proof containers or wrapped in plastic and sealed with duct tape. No sharp objects should be allowed to cut through the plastic. Wipe down the exterior of the containers with a damp rag to remove dust. All equipment, tools, material, etc. transported through occupied areas shall be made free from dust and moisture by vacuuming and wipe down.
  - 6. There shall be no standing water during construction. This includes water in equipment drip pans and open containers within the construction areas. All accidental spills must be cleaned up and dried within 12 hours. Remove and dispose of porous materials that remain damp for more than 72 hours.
  - 7. At completion, remove construction barriers and ceiling protection carefully, outside of normal work hours. Vacuum and clean all surfaces free of dust after the removal.
- I. Final Cleanup:
  - 1. Upon completion of project, or as work progresses, remove all construction debris from above ceiling, vertical shafts and utility chases that have been part of the construction.
  - 2. Perform HEPA vacuum cleaning of all surfaces in the construction area. This includes walls, ceilings, cabinets, furniture (built-in or free standing), partitions, flooring, etc.
  - 3. All new air ducts shall be cleaned prior to final inspection.
- J. Exterior Construction
  - 1. Contractor shall verify that dust will not be introduced into the medical center through intake vents or building openings. HEPA filtration on intake vents is required where dust may be introduced.
  - 2. Dust created from disturbance of soil such as from vehicle movement will be wetted with use of a water truck as necessary
  - 3. All cutting, drilling, grinding, sanding, or disturbance of materials shall be accomplished with tools equipped with either local exhaust ventilation (i.e. vacuum systems) or wet suppression controls.

### 1.13 TUBERCULOSIS SCREENING

- A. Contractor shall provide written certification that all contract employees assigned to the work site have had a pre-placement tuberculin screening within 90 days prior to assignment to the worksite and been found have negative TB screening reactions. Contractors shall be required to show documentation of negative TB screening reactions for any additional workers who are

added after the 90-day requirement before they will be allowed to work on the work site.

NOTE: This can be the Center for Disease Control (CDC) and Prevention and two-step skin testing or a Food and Drug Administration (FDA)-approved blood test.

1. Contract employees manifesting positive screening reactions to the tuberculin shall be examined according to current CDC guidelines prior to working on VHA property.
2. Subsequently, if the employee is found without evidence of active (infectious) pulmonary TB, a statement documenting examination by a physician shall be on file with the employer (construction contractor), noting that the employee with a positive tuberculin screening test is without evidence of active (infectious) pulmonary TB.
3. If the employee is found with evidence of active (infectious) pulmonary TB, the employee shall require treatment with a subsequent statement to the fact on file with the employer before being allowed to return to work on VHA property.

#### **1.14 FIRE SAFETY**

- A. Fire Safety Plan: Establish and maintain a site-specific 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 Contracting Officer Representative for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES. This plan may be an element of the Accident Prevention Plan.
- B. 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.
- C. Separate temporary facilities, such as trailers, storage sheds, and dumpsters, from existing buildings and new construction by distances in accordance with NFPA 241. For small facilities with less than 6 m (20 feet) exposing overall length, separate by 3m (10 feet).
- D. Temporary Construction Partitions:
  1. Install and maintain temporary construction partitions to provide smoke-tight separations between construction areas and adjoining areas. Construct partitions of gypsum board or treated plywood (flame spread rating of 25 or less in accordance with ASTM E84) on both sides of fire-retardant treated wood or metal steel studs. Extend the partitions through suspended ceilings to floor slab deck or roof. Seal joints and penetrations. At door openings, install Class C, ¾ hour fire/smoke rated doors with self-closing devices.
  2. Install one-hour fire-rated temporary construction partitions as shown on drawings to maintain integrity of existing exit stair enclosures, exit passageways, fire-rated enclosures of hazardous areas, horizontal exits, smoke barriers, vertical shafts and openings enclosures.
  3. Close openings in smoke barriers and fire-rated construction to maintain fire ratings. Seal penetrations with listed through-penetration firestop materials in accordance with Section 07 84 00, FIRESTOPPING.
- E. Temporary Heating and Electrical: Install, use and maintain installations in accordance with 29 CFR 1926, NFPA 241 and NFPA 70.
- F. Means of Egress: Do not block exiting for occupied buildings, including paths from exits to roads. Minimize disruptions and coordinate with Contracting Officer Representative.
- G. Egress Routes for Construction Workers: Maintain free and unobstructed egress. Inspect daily. Report findings and corrective actions weekly to Contracting Officer Representative.
- H. Fire Extinguishers: Provide and maintain extinguishers in construction areas and temporary storage areas in accordance with 29 CFR 1926, NFPA 241 and NFPA 10.
- I. Flammable and Combustible Liquids: Store, dispense and use liquids in accordance with 29 CFR 1926, NFPA 241 and NFPA 30.

- J. Sprinklers: Install, test and activate new automatic sprinklers prior to removing existing sprinklers.
- K. Existing Fire Protection: Do not impair automatic sprinklers, smoke and heat detection, and fire alarm systems, except for portions immediately under construction, and temporarily for connections. Provide fire watch for impairments more than 4 hours in a 24-hour period. Request interruptions in accordance with Article, OPERATIONS AND STORAGE AREAS, and coordinate with Contracting Officer Representative. All existing or temporary fire protection systems (fire alarms, sprinklers) located in construction areas shall be tested as coordinated with the medical center. Parameters for the testing and results of any tests performed shall be recorded by the medical center and copies provided to the Resident Engineer.
- L. Smoke Detectors: Prevent accidental operation. Remove temporary covers at end of work operations each day. Coordinate with Contracting Officer Representative.
- M. Hot Work: Perform and safeguard hot work operations in accordance with NFPA 241 and NFPA 51B. Coordinate with Contracting Officer Representative for permits m at least 72 hours in advance .
- N. Fire Hazard Prevention and Safety Inspections: Inspect entire construction areas weekly. Coordinate with, and report findings and corrective actions weekly to Contracting Officer Representative.
- O. Smoking: Smoking is prohibited in and adjacent to construction areas inside existing buildings and additions under construction. In separate and detached buildings under construction, smoking is prohibited except in designated smoking rest areas.
- P. Dispose of waste and debris in accordance with NFPA 241. Remove from buildings daily.
- Q. If required, submit documentation to the COR that personnel have been trained in the fire safety aspects of working in areas with impaired structural or compartmentalization features.

#### **1.15 ELECTRICAL**

- A. All electrical work shall comply with NFPA 70 (NEC), NFPA 70B, NFPA 70E, 29 CFR Part 1910 Subpart J – General Environmental Controls, 29 CFR Part 1910 Subpart S – Electrical, and 29 CFR 1926 Subpart K in addition to other references required by contract.
- B. All qualified persons performing electrical work under this contract shall be licensed journeyman or master electricians. All apprentice electricians performing under this contract shall be deemed unqualified persons unless they are working under the immediate supervision of a licensed electrician or master electrician.
- C. All electrical work will be accomplished de-energized and in the Electrically Safe Work Condition (refer to NFPA 70E for Work Involving Electrical Hazards, including Exemptions to Work Permit). Any Contractor, subcontractor or temporary worker who fails to fully comply with this requirement is subject to immediate termination in accordance with FAR clause 52.236-5(c). Only in rare circumstance where achieving an electrically safe work condition prior to beginning work would increase or cause additional hazards or is infeasible due to equipment design or operational limitations is energized work permitted. The Contracting Officer Representative with approval of the Medical Center Director will make the determination if the circumstances would meet the exception outlined above. An AHA and permit specific to energized work activities will be developed, reviewed, and accepted by the VA prior to the start of that activity.
  - 1. Development of a Hazardous Electrical Energy Control Procedure is required prior to de-energization. A single Simple Lockout/Tagout Procedure for multiple work operations can only be used for work involving qualified person(s) de-energizing one set of conductors or circuit part source. Task specific Complex Lockout/Tagout Procedures are required at all other times.
  - 2. Verification of the absence of voltage after de-energization and lockout/tagout is considered “energized electrical work” (live work) under NFPA 70E, and shall only be

performed by qualified persons wearing appropriate shock protective (voltage rated) gloves and arc rate personal protective clothing and equipment, using Underwriters Laboratories (UL) tested and appropriately rated contact electrical testing instruments or equipment appropriate for the environment in which they will be used.

3. Personal Protective Equipment (PPE) and electrical testing instruments will be readily available for inspection by the The Contracting Officer Representative.
- D. Before beginning any electrical work, an Activity Hazard Analysis (AHA) will be conducted to include Shock Hazard and Arc Flash Hazard analyses (NFPA Tables can be used only as a last alternative and it is strongly suggested a full Arc Flash Hazard Analyses be conducted). Work shall not begin until the AHA for the work activity and permit for energized work has been reviewed and accepted by the Contracting Officer Representative and discussed with all engaged in the activity, including the Contractor, subcontractor(s), and Government on-site representatives at preparatory and initial control phase meetings.
- E. Ground-fault circuit interrupters. GFCI protection shall be provided where an employee is operating or using cord- and plug-connected tools related to construction activity supplied by 125-volt, 15-, 20-, or 30- ampere circuits. Where employees operate or use equipment supplied by greater than 125-volt, 15-, 20-, or 30- ampere circuits, GFCI protection or an assured equipment grounding conductor program shall be implemented in accordance with NFPA 70E - 2015, Chapter 1, Article 110.4(C)(2)..

#### **1.16 FALL PROTECTION**

- A. The fall protection (FP) threshold height requirement is 6 ft (1.8 m) for ALL WORK, unless specified differently or the OSHA 29 CFR 1926 requirements are more stringent, to include steel erection activities, systems-engineered activities (prefabricated) metal buildings, residential (wood) construction and scaffolding work.
  1. The use of a Safety Monitoring System (SMS) as a fall protection method is prohibited.
  2. The use of Controlled Access Zone (CAZ) as a fall protection method is prohibited.
  3. A Warning Line System (WLS) may ONLY be used on floors or flat or low-sloped roofs (between 0 - 18.4 degrees or 4:12 slope) and shall be erected around all sides of the work area (See 29 CFR 1926.502(f) for construction of WLS requirements). Working within the WLS does not require FP. No worker shall be allowed in the area between the roof or floor edge and the WLS without FP. FP is required when working outside the WLS.
  4. Fall protection while using a ladder will be governed by the OSHA requirements.

#### **1.17 SCAFFOLDS AND OTHER WORK PLATFORMS**

- A. All scaffolds and other work platforms construction activities shall comply with 29 CFR 1926 Subpart L.
- B. The fall protection (FP) threshold height requirement is 6 ft (1.8 m) as stated in Section 1.16.
- C. The following hierarchy and prohibitions shall be followed in selecting appropriate work platforms.
  1. Scaffolds, platforms, or temporary floors shall be provided for all work except that can be performed safely from the ground or similar footing.
  2. Ladders less than 20 feet may be used as work platforms only when use of small hand tools or handling of light material is involved.
  3. Ladder jacks, lean-to, and prop-scaffolds are prohibited.
  4. Emergency descent devices shall not be used as working platforms.
- D. Contractors shall use a scaffold tagging system in which all scaffolds are tagged by the Competent Person. Tags shall be color-coded: green indicates the scaffold has been inspected and is safe to use; red indicates the scaffold is unsafe to use. Tags shall be readily visible, made of materials that will withstand the environment in which they are used, be legible and shall include:

1. The Competent Person's name and signature.
2. Dates of initial and last inspections.

E. Mast Climbing work platforms: When access ladders, including masts designed as ladders, exceed 20 ft (6 m) in height, positive fall protection shall be used.

#### **1.18 EXCAVATION AND TRENCHES**

- A. All excavation and trenching work shall comply with 29 CFR 1926 Subpart P. Excavations less than 5 feet in depth require evaluation by the contractor's "Competent Person" (CP) for determination of the necessity of an excavation protective system where kneeling, laying in, or stooping within the excavation is required.
- B. All excavations and trenches 24 inches in depth or greater shall require a written trenching and excavation permit (NOTE – some States and other local jurisdictions require separate state/jurisdiction-issued excavation permits). The permit shall have two sections, one section will be completed prior to digging or drilling and the other will be completed prior to personnel entering the excavations greater than 5 feet in depth. Each section of the permit shall be provided to the COR prior to proceeding with digging or drilling and prior to proceeding with entering the excavation. After completion of the work and prior to opening a new section of an excavation, the permit shall be closed out and provided to the COR. The permit shall be maintained onsite and the first section of the permit shall include the following:
1. Estimated start time & stop time
  2. Specific location and nature of the work.
  3. Indication of the contractor's "Competent Person" (CP) in excavation safety with qualifications and signature. Formal course in excavation safety is required by the contractor's CP.
  4. Indication of whether soil or concrete removal to an offsite location is necessary.
  5. Indication of whether soil samples are required to determine soil contamination.
  6. Indication of coordination with local authority (i.e. "One Call") or contractor's effort to determine utility location with search and survey equipment.
  7. Indication of review of site drawings for proximity of utilities to digging/drilling.
- C. The second section of the permit for excavations greater than five feet in depth shall include the following:
1. Determination of OSHA classification of soil. Soil samples will be from freshly dug soil with samples taken from different soil type layers as necessary and placed at a safe distance from the excavation by the excavating equipment. A pocket penetrometer will be utilized in determination of the unconfined compression strength of the soil for comparison against OSHA table (Less than 0.5 Tons/FT<sup>2</sup> – Type C, 0.5 Tons/FT<sup>2</sup> to 1.5 Tons/FT<sup>2</sup> – Type B, greater than 1.5 Tons/FT<sup>2</sup> – Type A without condition to reduce to Type B).
  2. Indication of selected protective system (sloping/benching, shoring, shielding). When soil classification is identified as "Type A" or "Solid Rock", only shoring or shielding or Professional Engineer designed systems can be used for protection. A Sloping/Benching system may only be used when classifying the soil as Type B or Type C. Refer to Appendix B of 29 CFR 1926, Subpart P for further information on protective systems designs.
  3. Indication of the spoil pile being stored at least 2 feet from the edge of the excavation and safe access being provided within 25 feet of the workers.
  4. Indication of assessment for a potential toxic, explosive, or oxygen deficient atmosphere where oxygen deficiency (atmospheres containing less than 19.5 percent oxygen) or a hazardous atmosphere exists or could reasonably be expected to exist. Internal combustion engine equipment is not allowed in an excavation without providing force air ventilation to lower the concentration to below OSHA PELs, providing sufficient oxygen levels, and atmospheric testing as necessary to ensure safe levels are maintained.

- D. As required by OSHA 29 CFR 1926.651(b)(1), the estimated location of utility installations, such as sewer, telephone, fuel, electric, water lines, or any other underground installations that reasonably may be expected to be encountered during excavation work, shall be determined prior to opening an excavation.
  - 1. The planned dig site will be outlined/marked in white prior to locating the utilities.
  - 2. Used of the American Public Works Association Uniform Color Code is required for the marking of the proposed excavation and located utilities.
  - 3. 811 will be called two business days before digging on all local or State lands and public Right-of Ways.
  - 4. Digging will not commence until all known utilities are marked.
  - 5. Utility markings will be maintained
- E. Excavations will be hand dug or excavated by other similar safe and acceptable means as excavation operations approach within 3 feet of identified underground utilities. Exploratory bar or other detection equipment will be utilized as necessary to further identify the location of underground utilities.
- F. Excavations greater than 20 feet in depth require a Professional Engineer designed excavation protective system.

#### **1.19 CRANES**

- A. All crane work shall comply with 29 CFR 1926 Subpart CC.
- B. Prior to operating a crane, the operator must be licensed, qualified or certified to operate the crane. Thus, all the provisions contained with Subpart CC are effective and there is no "Phase In" date.
- C. A detailed lift plan for all lifts shall be submitted to the COR 21 days prior to the scheduled lift complete with route for truck carrying load, crane load analysis, siting of crane and path of swing and all other elements of a critical lift plan where the lift meets the definition of a critical lift. Critical lifts require a more comprehensive lift plan to minimize the potential of crane failure and/or catastrophic loss. The plan must be reviewed and accepted by the General Contractor before being submitted to the VA for review. The lift will not be allowed to proceed without prior acceptance of this document.
- D. Crane operators shall not carry loads
  - 1. over the general public or VAMC personnel
  - 2. over any occupied building unless
    - a. the top two floors are vacated
    - b. or overhead protection with a design live load of 300 psf is provided

#### **1.20 CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT)**

- A. All installation, maintenance, and servicing of equipment or machinery shall comply with 29 CFR 1910.147 except for specifically referenced operations in 29 CFR 1926 such as concrete & masonry equipment (1926.702(j), heavy machinery & equipment (1926.600(a)(3)(i)), and process safety management of highly hazardous chemicals (1926.64). Control of hazardous electrical energy during the installation, maintenance, or servicing of electrical equipment shall comply with Section 1.15 to include NFPA 70E and other VA specific requirements discussed in the section.

#### **1.21 CONFINED SPACE ENTRY**

- A. All confined space entry shall comply with 29 CFR 1926, Subpart AA except for specifically referenced operations in 29 CFR 1926 such as excavations/trenches (1926.651(g)).
- B. A site-specific Confined Space Entry Plan (including permitting process) shall be developed and submitted to the COR.

**1.22 WELDING AND CUTTING**

- A. As specified in section 1.14, Hot Work: Perform and safeguard hot work operations in accordance with NFPA 241 and NFPA 51B. Coordinate with COR. Obtain permits from COR at least 72 hours in advance .

**1.23 LADDERS**

- A. All Ladder use shall comply with 29 CFR 1926 Subpart X.
- B. All portable ladders shall be of sufficient length and shall be placed so that workers will not stretch or assume a hazardous position.
- C. Manufacturer safety labels shall be in place on ladders
- D. Step Ladders shall not be used in the closed position
- E. Top steps or cap of step ladders shall not be used as a step
- F. Portable ladders, used as temporary access, shall extend at least 3 ft (0.9 m) above the upper landing surface.
  - 1. When a 3 ft (0.9-m) extension is not possible, a grasping device (such as a grab rail) shall be provided to assist workers in mounting and dismounting the ladder.
  - 2. In no case shall the length of the ladder be such that ladder deflection under a load would, by itself, cause the ladder to slip from its support.
- G. Ladders shall be inspected for visible defects on a daily basis and after any occurrence that could affect their safe use. Broken or damaged ladders shall be immediately tagged "DO NOT USE," or with similar wording, and withdrawn from service until restored to a condition meeting their original design.

**1.24 FLOOR & WALL OPENINGS**

- A. All floor and wall openings shall comply with 29 CFR 1926 Subpart M.
- B. Floor and roof holes/openings are any that measure over 2 in (51 mm) in any direction of a walking/working surface which persons may trip or fall into or where objects may fall to the level below. Skylights located in floors or roofs are considered floor or roof hole/openings.
- C. All floor, roof openings or hole into which a person can accidentally walk or fall through shall be guarded either by a railing system with toe boards along all exposed sides or a load-bearing cover. When the cover is not in place, the opening or hole shall be protected by a removable guardrail system or shall be attended when the guarding system has been removed, or other fall protection system.
  - 1. Covers shall be capable of supporting, without failure, at least twice the weight of the worker, equipment and material combined.
  - 2. Covers shall be secured when installed, clearly marked with the word "HOLE", "COVER" or "Danger, Roof Opening-Do Not Remove" or color-coded or equivalent methods (e.g., red or orange "X"). Workers must be made aware of the meaning for color coding and equivalent methods.
  - 3. Roofing material, such as roofing membrane, insulation or felts, covering or partly covering openings or holes, shall be immediately cut out. No hole or opening shall be left unattended unless covered.
  - 4. Non-load-bearing skylights shall be guarded by a load-bearing skylight screen, cover, or railing system along all exposed sides.
  - 5. Workers are prohibited from standing/walking on skylights.

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## **SECTION 01 35 26.19**

### **SPECIAL PROJECT PROCEDURES FOR HEALTHCARE FACILITIES**

#### **PART 1 - GENERAL**

##### **1.1 SUMMARY**

- A. Section Includes:
  - 1. Hudson Valley Health Care System Construction Forms.
- B. Related Requirements:
  - 1. Section 01 35 26 SAFETY REQUIREMENTS.

#### **PART 2 - NOT USED**

#### **PART 3 - EXECUTION**

##### **3.1 FORMS**

- A. Hudson Valley Health Care System Infection Control During Construction and Renovation Policy 11IC-05HV.
  - 1. Attachment A – ICRA Risk Matrix
  - 2. Attachment B – Infection Control Risk Assessment Work Permit
  - 3. Attachment C – Instruction for Completion of Infection Control Risk Assessment Work Permit
  - 4. Attachment D – Products and Materials for ICRA Containment – Examples
  - 5. Attachment E – Daily Construction – Infection Control Interventions Compliance Monitor
  - 6. Attachment F – Infection Prevention and Control During Construction Pamphlet
- B. Hudson Valley Health Care System Construction Standard Procedures Quality Assurance for Project SOP 138-22HV.
  - 1. Attachment C: Equipment Installed Under Construction
  - 2. Attachment D: Hazard Evaluation
  - 3. Attachment E: Dig and Excavating Permit Request
  - 4. Attachment F: Electrical Outage Checklist.
- C. Hudson Valley Health Care System Domestic Hot Water Temperature SOP 138-12HV
- D. Hudson Valley Health Care System Hot Work Procedures SOP 138-13HV
- E. Hudson Valley Health Care System Scaffold and Ladder Regulations SOP 138-15HV
- F. Hudson Valley Health Care System Chilled/Heating Hot Water Generation and Distribution Systems SOP 138-58HV
- G. Hudson Valley Health Care System Engineering Service Infection Control Policy SOP 138-60HV
- H. Hudson Valley Health Care System Housekeeping Safety on Construction Projects SOP 138-62HV
- I. Hudson Valley Health Care System Asbestos Permit
- J. Hudson Valley Health Care System Request to Work After Hours Memorandum.

##### **3.2 ATTACHMENTS**

- A. The above reference Hudson Valley Health Care System Standard Operation Procedures, Permits, Forms, and Memorandum are attached following this section.

Special Project Procedures for Healthcare Facilities

**END OF SECTION**

11IC-05HV

## INFECTION CONTROL DURING CONSTRUCTION AND RENOVATION

VA Hudson Valley Health Care System

Issue Date: 11/27/2018

Update: 11/27/2021

1. **PURPOSE:** To outline the requirements for managing all new construction, renovation, demolition, or structural repairs within the medical center in a manner designed to minimize the potential for the spread of infections due to degraded air quality, environmental contamination, or contamination of water.
  
2. **POLICY:** VA Hudson Valley Health Care System (HVHCS) utilizes a multidisciplinary, systematic approach, identified as the Infection Control Risk Assessment (ICRA). This assessment is based on the type and scope of work activity, the areas involved, and the risk to patients and personnel. Specific controls are then identified for containment of hazards. Engineering, Environmental Management, Safety, and Infection Control will have continuous involvement in the assessment, revision, monitoring, and compliance with ICRA. This policy applies to all VA HVHCS owned buildings. This policy will be used as a guideline in VA HVHCS buildings and leased clinics.
  
3. **RESPONSIBILITIES:** The overall approach relies on a multidisciplinary team that includes Infection Control, Chief of Engineering, Engineering Project and Design Contract Officer Representatives (CORs), Repair and Maintenance Foremen, Chief of Environmental Management Service (EMS), EMS Interior Design Foremen, Contractors, and Safety. Members of this team are responsible to integrate the infection prevention and control principles in this policy throughout the planning, managing, and completion of every demolition, construction, renovation or repair activity that have the potential to transmit various air and waterborne contaminations (biological, chemical, particulate).
  - a. **The Chief, Engineering Service** is responsible for:
    - 1) Ensuring all construction, renovation or repair activity performed by Project and Design Section and Repair and Maintenance or their contractors conduct an infection control risk assessment (ICRA) as explained in this policy and all their personnel have documented training on this policy and have been provided the pamphlet (See Attachment D)
    - 2) Ensuring the ICRA Level III and IV are tracked and reported to the Construction Safety Committee monthly
    - 3) Ensuring the ICRA Level III and V are reported to the EOC Committee during the quarterly Construction Safety report to the EOC
    - 4) Ensuring all "active" (actual on-site work requiring controls) Level III and IV ICRAs are reported to the ICP and Safety
    - 5) Ensuring necessary containment equipment is available for Engineering personnel or contractors to use during construction/renovation activities. (See Attachment C: Products and Materials for ICRA Containment-Examples)
  
  - b. **The Chief, EMS** is responsible for:
    - 1) Ensuring all renovation or repair activity performed by Interior Design

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Foremen or Housekeeping Aide Foremen or their contractors conduct an infection control risk assessment as explained in this policy and all EMS personnel have documented training on this policy

- 2) Ensuring the ICRA Level III and IV are tracked and reported to the Construction Safety Committee monthly
- 3) Ensuring all "active" (actual on-site work requiring controls) Level III and IV ICRAs are reported to the ICP and Safety
- 4) Ensuring necessary containment equipment is available for Engineering personnel or contractors to use during construction/renovation activities. (See Attachment C: Products and Materials for ICRA Containment-Examples)

c. **The Infection Control Practitioner (ICP)** is responsible for:

- 1) Identifying high-risk patient populations in consultation with hospital staff
- 2) Determining whether construction poses sufficient increased risk to require patients be moved to an area of the facility that is not affected by construction
- 3) Participating on the multidisciplinary pre-construction hazard evaluation team or individual consultation to provide input on the ICRA level
- 4) Signing off on all Level III and IV ICRA permits
- 5) Evaluating the need for baseline TB testing based on the results of the Infection Control Committee's annual TB Risk Assessment and the construction/renovation site location, ingress/egress routes, patient population and hospital layout
- 6) Conducting periodic audits of Level III and IV ICRA permitted construction/renovation activities
- 7) Assisting in providing training to personnel in infection control during construction/renovation activities as requested

d. **The Safety Manager** is responsible for:

- 1) Ensuring Safety Section provides trained Safety personnel to participate on the multidisciplinary pre-construction hazard evaluation team
- 2) Ensuring all Safety Section personnel have received documented training on this policy
- 3) Working with Engineering Project and Design and Repair and Maintenance and Environmental Management to develop and carry out indoor air quality and ventilation assessments as needed
- 4) Conducting periodic surveillance of Level III and IV permitted construction/renovation activities (see Attachment D: Daily Construction-Infection Control Interventions Compliance Monitor)
- 5) Providing a designated trained backup for Infection Control in the determination of ICRA levels
- 6) Assisting in providing training to personnel in infection control during construction/renovation activities as requested

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**4. PROCEDURE:**

- a. This policy applies to all construction/renovation performed within the medical center whether performed by staff for minor station projects or by contractor personnel during major construction/renovation. NOTE: For the purposes of this policy "Project Manager" (PM) is defined as the individual responsible for oversight of the project construction, renovation, or maintenance activity. This may include the Project & Design COR, Repair and Maintenance Foreman/Supervisor, EMS Interior Design/Paint Shop Foreman, EMS Supervisor, Information Resource Management (IRM) Cabling Contractor.
- b. The designated PM for each construction/renovation activity must determine its ICRA Classification to ensure proper controls are in place prior to initiation of any construction/demolition or renovation work.
- c. To assist in determining the ICRA requirements, the PM will review with Infection Control, the project's scope of work, design, surrounding locations, and the impact on utility systems using the attached ICRA Risk Matrix (See section j) where construction activity type, risk group, and classification levels are assigned. The ICRA level must be recorded on the SOP 138-22HV: Construction Standard Procedures Quality Assurance or Projects, Attachment 4-Hazard Evaluation Form, prior to the start of a project.
- d. The PM and ICP will complete an ICRA Permit for every project evaluated to be a Level III or IV (see Attachment A: Infection Control Risk Assessment Work Permit and Attachment B: Instructions for Completion of the Infection Control Risk Assessment Permit).
- e. The results of the ICRA for the project and this policy will be identified in the project bid specifications (for outside contracting work) to ensure all bidders are aware of the requirements of this policy.
- f. A log of all ICRAs evaluated at Level III or IV will be maintained by the Chief of Engineering Service.
- g. The PM is responsible for ensuring daily surveillance of active Level III and IV construction/renovation activities under his/her supervision are conducted and documented by trained personnel (see Attachment D: Daily Construction-Infection Control Interventions Compliance Monitor).
- h. The PM is responsible for informing the ICP and Construction Safety Committee of the scheduled and active/in progress Level III and IV projects to ensure the ICP can do ad hoc inspections of the activity as needed.
- i. The needs on a given project may change over the life of the project. When

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changes are made, the PM and staff responsible for implementing and monitoring compliance will be reoriented.

- j. The PM may submit the ICRA request in phases for the various stages of the project (e.g. one for demolition, one for construction, and one for finishing work) or may request a change in the ICRA classification from Infection Control during the project as certain demolition and dust generating work is completed. IC will review the scope and nature of the remaining work and adjust the ICRA class accordingly.
- k. Completion of the ICRA Risk Matrix:
  - 1) Determine the construction activity type using Table 1. Activity types are defined by the amount of dust that is generated, the potential for water aerosolizing, the duration of the activity, and the amount of shared HVAC systems.
  - 2) Definitions of Infection Control Risk Groups. Determine the Risk Group using Table 2. The Risk Groups have been classified by IC. Contact IC if a group is not identified.
  - 3) Infection Control Risk Assessment Intervention. Use the criteria identified in Table 1 (Construction Type) and Table 2 (Risk Group) in Table 3 to identify the ICRA Classification Level.
  - 4) Interventions by classifications Levels I to Level IV, refer to Table 4.
    - a) Level I – Infection Control Interventions
      - (1) An ICRA Work Permit is not required, however the PM may complete one if desired.
      - (2) The PM or Contractor are responsible for identifying when Level I interventions apply per the Tables 1, 2, and 3. If unclear, they are to consult with IC.
      - (3) The PM or Contractor are to verify that Level I interventions are maintained for all projects for which they are responsible.
    - b) Refer to Table 4 for specific interventions.
    - c) Level II – Infection Control Interventions:
      - (1) Must adhere to all Level II interventions in addition to the Level I interventions.
      - (2) An ICRA Work Permit is not required, however the PM may complete one if desired.
      - (3) The Contractor and PM are responsible for identifying when Level II interventions apply per Tables 1, 2, and 3. If unclear, they are to consult with IC.
      - (4) The PM or Contractor are to verify that Level I & II interventions are maintained for all projects for which they are responsible.
      - (5) Refer to Table 4 for specific interventions.
    - d) Level III – Infection Control Interventions:
      - (1) Must adhere to all Level III interventions in addition to Level II and Level I interventions.

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- (2) The PM and ICP are required to complete an ICRA.
- (3) The PM or Contractor are to verify that Level III interventions are maintained for all projects for which they are responsible.
- (4) Refer to Table 4 for specific interventions.
- e) Level IV – Infection Control Interventions:
  - (1) Adhere to all Level IV interventions in addition to the Level III, Level II, and Level I interventions.
  - (2) The PM and ICP are required to complete ICRA.
  - (3) The PM or Contractor are to verify that Level IV interventions are maintained for all projects for which they are responsible.
  - (4) Refer to Table 4 for specific interventions.

**5. REFERENCES:**

- SOP 138-22HV: Construction Standard Operating Procedures Quality Assurance for Projects
- Association of Professionals in Infection Control and Epidemiology, Inc., Bartley JM, editor: APIC Infection Control Toolkit series, construction and renovation, ed 3, Washington DC, 2007, Association of Professionals in Infection Control and Epidemiology, Inc. Press
- Bartley JM: APIC state of the art report: The role of infection control during construction in health care facilities, Am J Infect Control 28:156-169, 2000
- APIC Text of Infection Control and Epidemiology, Washington DC, 2011, Association of Professionals in Infection Control and Epidemiology, Inc. Press
- Centers for Disease Control and Prevention (CDC), Guideline for Environmental Infection Control in Health Care Facilities, 2003
- VHA Directive 7715, Safety and Health During Construction, dated April 6, 2017

**6. RESCISSION: 11IC-05HV: Infection Control During Construction and Renovation issued April 15, 2015**



for MARGARET B. CAPLAN  
Medical Center Director

**Attachments:**

- Attachment A – ICRA Risk Matrix
- Attachment B - Infection Control Risk Assessment Work Permit
- Attachment C - Instructions for Completion of Infection Control Risk Assessment Work Permit
- Attachment D – Products and Materials for ICRA Containment – Examples
- Attachment E – Daily Construction – Infection Control Interventions Compliance

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Monitor

- Attachment F – Infection Prevention and Control During Construction Pamphlet

Originator: ICC/Im

Distribution: Web Page

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**ATTACHMENT A: ICRA RISK MATRIX**

**TABLE 1: Construction Activity TYPE Definition Guideline Grid**

Type A	<p><b>Inspection and non-invasive activities</b>          Includes, but is not limited to:</p> <ul style="list-style-type: none"> <li>• Opening of a single ceiling tile for visual inspection or tile replacement.</li> <li>• Painting (but not sanding)</li> <li>• Wall covering, electrical trim work, minor plumbing, and activities which do not generate dust or require cutting of walls or access to ceilings other than for visual inspection</li> </ul>
Type B	<p><b>Small scale, short duration activities which create minimal dust</b>          Includes, but is not limited to:</p> <ul style="list-style-type: none"> <li>• Opening of more than one ceiling tile per 10 tiles</li> <li>• Installation of telephone and computer cabling</li> <li>• Access to mechanical chase or shaft spaces</li> <li>• Cutting of walls or ceiling where dust migration can be controlled (e.g. use of dust control tools)</li> <li>• Wet sanding of walls</li> </ul>
Type C	<p><b>Work that generates a moderate to high level of dust</b>          Includes, but is not limited to:</p> <ul style="list-style-type: none"> <li>• Dry sanding of walls</li> <li>• Cutting of walls, removal of drywall or building finish components where work is limited to one room or suite (including removal of floor coverings, wall paper, ceiling tiles, and casework)</li> <li>• Wall demolition or new wall construction</li> <li>• Minor duct work, plumbing work, or electrical work above ceilings (not including <u>system</u> demolition or installation)</li> <li>• Major cabling pulling activities, multiple rooms/lines where multiple access points are needed</li> <li>• Any activity which requires construction of a barrier that does not qualify as Type D</li> </ul>
Type D	<p><b>Major demolition and major construction projects</b>          Includes, but is not limited to:</p> <ul style="list-style-type: none"> <li>• Activities which require the closure of a unit/wing or relocation of an entire patient area</li> <li>• Demolition, removal, or installation of a complete cabling, HVAC, plumbing, medical gas, or electrical system</li> <li>• Demolition of major fixed building components, assemblies, fit-out elements, or structural elements</li> <li>• New construction located in close proximity (as determined by the ICRA team) of the hospital building</li> <li>• Outdoor construction of new structures located in close proximity (as determined by the ICRA team) to existing patient care facility</li> <li>• Excavation activities within close proximity (as determined by the ICRA team) of hospital building</li> </ul>

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**TABLE 2: Risk Group**

Low Risk	Medium Risk	High Risk	Highest Risk
<p>Mechanical spaces where air is not recirculated</p> <p>Office areas <u>not</u> attached to or adjoining patient care areas or used for patient interviews, exams, or evaluations</p> <p>Public corridors and spaces <u>not</u> on or directly attached to patient units or treatment locations.</p>	<p>All other patient care areas not otherwise listed (e.g. outpatient areas, clinic areas, physical therapy, imaging, ultrasound, radiology, respiratory therapy, domiciliary, Admissions</p> <p>Clinical Laboratories, (except Microbiology and Virology)</p> <p>Main Kitchen</p> <p>Public corridors and spaces directly attached to patient units or treatment locations</p> <p>Office areas attached to or adjoining patient care areas or used for patient interviews, exams, or evaluations</p>	<p>Urgent Care Area</p> <p>Mental Health In Patient Units</p> <p>Laboratories (Microbiology and virology)</p> <p>Nutrition and Food Service food prep areas</p> <p>Nuclear Medicine</p> <p>Pharmacy</p> <p>Supply &amp; Distribution</p> <p>Geriatric CLCs Inpatient Medicine</p>	<p>Oncology Clinic</p> <p>Sterile Processing Service</p> <p>Surgery/OR/Post anesthesia Endoscopy</p> <p>Negative Pressure Isolation rooms</p> <p>Any areas with severe immune compromised patients</p>

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**TABLE 3: ICRA CLASSIFICATION LEVEL GRID**

<b>CONSTRUCTION ACTIVITY→</b>	<b>TYPE A</b>	<b>TYPE B</b>	<b>TYPE C</b>	<b>TYPE D</b>
<b>RISK GROUP ↓</b>	ICRA Level↓:	ICRA Level↓:	ICRA Level↓:	ICRA Level↓:
<i>Low Risk</i>	I	II	II	III
<b>Medium Risk</b>	I	II	III	<b>IV</b>
<b>High Risk</b>	I	II	III	<b>IV</b>
<b>Highest Risk</b>	II	III or IV	III or IV	<b>IV</b>

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**TABLE 4: INTERVENTIONS BY CLASSIFICATION LEVELS I TO LEVEL IV**

	During Construction	Upon Completion of Project
<i>Class I</i>	1. Execute work by methods to minimize raising dust from construction operations.	
	2. Immediately replace a ceiling tile displaced for visual inspection	
<i>Class II</i>	1. Provide active means to prevent airborne dust from dispersing into atmosphere	1. Wipe work surfaces with disinfectant
	2. Water mist work surfaces to control dust while cutting.	2. Contain construction waste before transport in tightly covered containers
	3. Seal unused doors with duct tape	3. Wet mop and/or vacuum with HEPA filtered vacuum before leaving work area
	4. Block off and seal air vents	
	5. Place dust mat at entrance and exit of work area	4. Remove isolation of HVAC system in areas where work is being performed
	6. Remove or isolate HVAC system in areas where work is being performed	
<i>Class III</i>	1. Remove or isolate HVAC system in area where work is being done to prevent contamination of duct system	1. Do not remove barriers from work area until completed project is inspected by the Safety Department and Infection Control and thoroughly cleaned by EMS.
	2. Complete all critical barriers i.e. sheetrock, plywood, plastic, to seal area from non-work area or implement control cube cart (cart with plastic covering and sealed connection to work site with HEPA vacuum for vacuuming prior to exit) before construction begins	2. Remove barrier materials carefully to minimize spreading of dirt and debris associated with construction.
	3. Maintain negative air pressure within work site utilizing HEPA equipped air filtration units.	3. Vacuum work area with HEPA filtered vacuums
	4. Contain construction waste before transport in tightly covered containers.	4. Wet mop area with disinfectant
	5. Cover transport receptacles or carts. Tape covering unless solid lid.	5. Remove isolation of HVAC system in areas where work is being performed
<i>Class IV</i>	1. Isolate HVAC system in area where work is being done to prevent contamination of duct system.	1. Remove barrier material carefully to minimize spreading of dirt and debris associated with construction
	2. Complete all critical barriers i.e. sheetrock, plywood, plastic, to seal area from non-work area or implement control cube cart (cart with plastic covering and sealed connection to work site with HEPA vacuum for vacuuming prior to exit) before construction begins	2. Contain construction waste before transport in tightly covered containers
	3. Maintain negative air pressure within work site utilizing HEPA equipped air filtration units.	3. Cover transport receptacles or carts.
	4. Seal holes, pipes, conduits, and punctures appropriately.	4. Tape covering unless solid lid.
	5. Construct anteroom and require all personnel to pass through this room so they can be vacuumed using HEPA vacuum cleaner before leaving work site or they can wear paper coveralls that are removed each time they leave the work site.	5. Vacuum work area with HEPA filtered vacuums.
	6. All personnel entering work site are required to wear shoe covers. Shoe covers must be changed each time the worker exits the work area.	6. Wet mop area with disinfectant.
	7. Do not remove barriers from work area until completed project is inspected by Infection Control and Safety and thoroughly cleaned by EMS.	7. Remove isolation of HVAC system in areas where work is being performed.

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**ATTACHMENT B: INFECTION CONTROL RISK ASSESSMENT WORK PERMIT**

<b>Infection Control Risk Assessment WORK PERMIT</b>					
Permit #:		Prepared by:		Telephone:	
Project # and Location:			Project Start Date:		
Project Manager & Telephone:			Estimated Duration:		
Contractor Performing work:			Permit Expiration Date:		
Contractor Supervisor & Cell Phone:					
<b>YES</b>	<b>RISK Level</b>	<b>YES</b>	<b>Construction Activity TYPE</b>		
	Low Risk Area		TYPE A: Inspection, non-invasive activity		
	Medium Risk Area		TYPE B: Small scale, short duration, minimal levels of dust		
	High Risk Area		TYPE C: Activity generates moderate to high levels of dust.		
	Highest Risk Area		TYPE D: Major duration and construction activities.		

CONSTRUCTION ACTIVITY→	TYPE A	TYPE B	TYPE C	TYPE D
<b>RISK GROUP</b> ↓	ICRA Level↓:	ICRA Level↓:	ICRA Level↓:	ICRA Level↓:
<i>Low Risk</i>	I	II	II	III
<b>Medium Risk</b>	I	II	III	IV
<b>High Risk</b>	I	II	III	IV
<b>Highest Risk</b>	II	III or IV	III or IV	IV

Note: Infection Control approval and an ICRA Work Permit will be required for Level III or Level IV projects.

**Complete the following for Level III and Level IV projects.**  
 Identify the areas surrounding the project area and the risk level for those locations.  
 If more than one risk level is identified, select the higher risk level.

Unit Below	Unit Above	Lateral	Lateral	Behind	Front
<b>Risk Group:</b>					

<b>Specific site of activity (patient room, corridor, medication room, storage room, etc):</b>
<b>Possible HVAC, plumbing, and electrical issues and the probability of unplanned outages that will impact patient care:</b>
<b>Indicate potential risk of water incursion occurring outside the work zone:</b>
<b>HVAC: Describe local or system isolation of work site:</b>
<b>What shifts will the majority of the work be done?</b>

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<b>ICRA containment Barrier type:</b>	
<b>ICRA containment Door type:</b>	
<b>Ante-room (yes/no):</b>	
<b>Size of HEPA negative air machine and to where it will be exhausted:</b>	
<b>Will a continuous read negative air pressure monitor (chart recorder) be used?</b>	
All Infection Control Interventions for the assigned classification levels will be implemented in addition to the previous interventions.	
<b>LEVEL I</b>	<ol style="list-style-type: none"> <li>1. Execute work by methods to minimize raising dust from construction operations.</li> <li>2. Immediately replace any ceiling tile displaced for visual inspection.</li> </ol>
<b>LEVEL II</b>	<ol style="list-style-type: none"> <li>1. Provide active means to prevent air-borne dust from dispersing into atmosphere, which may include the use of a Control Cube.</li> <li>2. Water mist work surfaces to control dust while cutting.</li> <li>3. Seal unused doors with masking tape.</li> <li>4. Block off and seal air vents.</li> <li>5. Doors and windows within the work zone to remain closed at all times except during ingress/egress.</li> </ol>
<b>LEVEL III</b>	<ol style="list-style-type: none"> <li>1. Isolate HVAC system in area where work is being done to prevent contamination of duct system. Maintain until barrier is removed at completion of project.</li> <li>2. Designate entry and exit traffic pattern, unauthorized personnel are not permitted to enter work zone, traffic control signs placed.</li> <li>3. Complete all critical barriers or implement control cube method before construction begins. Will stay in place until IC or PM authorizes removal.</li> <li>4. Maintain negative pressure within work site and utilize HEPA equipped negative air machines. Both will be maintained until project &amp; terminal cleaning are completed and IC authorizes removal.</li> <li>5. Air pressure to be monitored &amp; documented at least daily.</li> <li>6. Adhesive mats placed at all entrances &amp; exists of work area.</li> </ol>
<b>LEVEL IV</b>	<ol style="list-style-type: none"> <li>1. Seal all holes, pipes and conduits penetrations in work area.</li> <li>2. Construct anteroom for staging of equipment &amp; donning of coveralls.</li> <li>3. Workers will wear coveralls in work area. Upon completion of major dust generating activities, coverall requirement is removed.</li> <li>3. Coveralls are removed in work zone before entering anteroom.</li> <li>4. Any residual dust left on workers shall be removed by vacuum.</li> <li>5. Shoe covers will be worn by workers and removed in the ante room when exiting area.</li> </ol>
<ol style="list-style-type: none"> <li>3. All policies &amp; procedures for renovation/construction/maintenance will be followed.</li> <li>4. Contractor is educated before the start of the project about the importance of adhering to Infection Control measures.</li> <li>5. When complete immediately clean up any dirt or debris.</li> <li>6. Place adhesive mat at entrance and exit of work area as necessary.</li> <li>7. Cover transport receptacles or carts.</li> <li>8. Contain construction waste before transport in tightly covered containers.</li> <li>9. Use designated removal route/elevators for removal of debris.</li> <li>10. Wet mop and/or vacuum with HEPA filtered vacuum at end of job or end of work shift. Area to be free of dust and or debris.</li> <li>7. The contractor will maintain the construction zone in a clean manner.           <ul style="list-style-type: none"> <li>• The area will be HEPA-vacuumed or damp mopped daily or more often as necessary to minimize dust.</li> <li>• Daily cleanup of debris, material and waste shall be completed.</li> <li>• Adhesive mats monitored &amp; changed on a regular basis so that they remain effective.</li> <li>• Any dust or construction debris tracked outside of the work area will be promptly cleaned.</li> </ul> </li> <li>8. Terminal cleaning will be performed following protocol.</li> <li>9. The terminal cleaning will be inspected by the Owner prior to the authorization for the barrier removal.</li> <li>10. Air samples may be performed following IC/Safety protocol.</li> <li>11. Barriers will be removed carefully to minimize spreading of construction dust and debris.</li> <li>6. All renovation, construction, maintenance &amp; tool carts leaving area must be covered &amp; the wheels wiped down with a disinfectant solution.</li> <li>7. Environmental Management Service (EMS) or a contract cleaner will vacuum or damp mop the area outside the work zone and adjacent areas.</li> </ol>	
<b>PRE-CONSTRUCTION RISK ASSESSMENT FOR THE TRANSMISSION OF TUBERCULOSIS (TB) TO THE CONTRACTED CONSTRUCTION WORKER</b> <input type="checkbox"/> NOT REQUIRED: No potential risk of contact or shared air space with TB patient/clinical specimen <input type="checkbox"/> REQUIRED: Potential risk of contact or potential of shared air space with TB patients / clinical specimen	
<b>ADDITIONAL COMMENTS OR REQUIREMENTS:</b>	
<b>Signature Infection Preventions:</b>	<b>Date:</b>
<b>Issued to Project Manager:</b>	<b>Date:</b>
<b>Issued to Contractor (print name and signature)</b>	<b>Date:</b>

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**ATTACHMENT C: INSTRUCTIONS FOR COMPLETION OF INFECTION CONTROL  
 RISK ASSESSMENT WORK PERMIT**

**Instructions for filling out ICRA Permit**

**Step Four:**

Identify the areas surrounding the project area and the risk level for that location.

If more than one risk level is identified, select the higher risk level

Unit Below	Unit Above	Lateral	Lateral	Behind	Front
<b>Risk Group:</b>					

**Step Five:**

Identify the specific site of activity eg. patient room, corridor, medication room.

**Step Six:**

Identify issues related to HVAC, plumbing, and electrical in terms of the probability of unplanned outages that will impact patient care.

**Step Seven:**

Water Incursion: Indicate potential risk of water damage outside construction zone:

**Step Eight:**

Identify ICRA containment measures:

Wall type:

Ante-room (yes/no):

Door Type:

Size of HEPA negative air machine:

Will a continuous read negative air pressure monitor (chart recorder) be used?

Frequency of manual verifications and documentation of negative air:

HVAC. Describe local or system isolation of work site:

If temporary ventilation or humidification is necessary, how will this be accomplished:

**Step Nine:**

Work Hours: Will the work be done during non-patient care hours?

What shifts will the majority of the work be done?

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**ATTACHMENT D: PRODUCTS AND MATERIALS FOR ICRA CONTAINMENT-EXAMPLES**

- A. Barrier types: Fire retardant polyethylene, usually 6-mil thickness, gypsum wall board, fire rated fiberglass reinforced plastic (like Fire-X Glass board), plywood and Masonite (must be painted with fire resistant paint (Flame Control Coatings, #320A or similar) prior to entering the building), and/or other fire resistive materials as specified in the ICRA Work Permit.
- B. Carpet Vacuum: Nobles Ultra-glide 18" w/ dual motors and HEPA filters, or an equivalent commercial grade carpet vacuum cleaner. An equivalent vacuum must have HEPA filters.
- C. Control Cube: Portable Ceiling Access Module, "Kontrol Kube Jr." with heavy duty vinyl enclosure as manufactured by Fiberlock Technologies, Inc. 680 Putnam Ave. Cambridge, MA 02139 or similar.
- D. Door types: Solid core wood door in wood or metal frame, metal door in metal frame, zipper door in polyethylene, or an overlapped polyethylene entrance as specified in the ICRA Work Permit. Masonite doors may be used if painted with fire resistant paint (Flame Control Coatings, #320A or similar) prior to entering the building.
- E. Exhaust Hoses: Heavy duty, flexible steel reinforced; Ventilation Blower Hose, WPG as manufactured by Federal Hose Mtg. Co Painesville, OH 44077 or similar.
- F. HEPA Vacuum: A 'shop style' vacuum with a HEPA filter cartridge filter at 99.97% filtration @ 0.5 microns, similar to Dayton part # 4TB93. This filter shall be used in conjunction with a dust collection pre-filter bag for fine particles and dust, like Dayton part # 1UG85.
- G. Negative Air Machine: HEPA filter equipped negative air machines that provide roughing filters, primary filters, and HEPA final filters, with a rating of 200 to 2000 cubic feet per minute (CFM). HEPA filters to be a minimum of 99.97% efficient. The HEPA filter will be factory scan tested and factory accepted after manufacture. No leaks greater than 0.01 of the upstream concentration at rated capacity of 2,000 CFM. Initial clean resistance shall be no more than 1.35" W. C. @ 2,000 CFM (for 2000 CFM machines). Supplier: Airborne Contamination Identification Associates, Abatement Technologies, or similar.  
NOTE: The HEPA filter in the negative air machine will be certified upon new installation into the machine and at least semi-annually thereafter. More frequent certification may be required as determined necessary during the ICRA process
- H. Walk-Off Mats (adhesive): Provide minimum size mats of 18 inches x 24 inches as manufactured by 3M, St. Paul, MN 55144 or similar.

Dust Control Tools: (Drills, sanders, saws, grinder) as manufactured by Hilti or similar.

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**ATTACHMENT E: DAILY CONSTRUCTION - INFECTION CONTROL INTERVENTIONS  
 COMPLIANCE MONITOR**

<b>DATE:</b>		<b>PROJECT:</b>		
<b>PROJECT PM:</b>		<b>PROJECT LOCATION:</b>		
<b>OBSERVATIONS BY:</b>				
<b>INFECTION CONTROL INTERVENTIONS</b>	<b>YES</b>	<b>NO</b>	<b>NA</b>	<b>COMMENT</b>
ICRA Permit Posted for Level III or Level IV				
HEPA Vacuum, coveralls, booties, cleaning supplies available at the work zone entrance.				
Construction barriers intact, no visual evidence of dust escaping the work zone				
Traffic restricted to construction personnel and traffic control signs posted and intact				
Construction personnel using designated entrance/exits and are following designated travel routes				
Walk off adhesive mats clean & adequate to contain construction dust				
Negative air machine running, ducting intact, filters certified as necessary – no excess fumes/vapor				
Negative air pressure maintained & documented				
All windows closed behind barrier. Debris chute (if applicable) closed if not in use				
HVAC vents remain isolated and sealed off				
Daily cleaning of the work zone.				
Ante Room clean (if required)				
Entrance/exit & adjacent areas free of dust & debris				
Carts covered during transport of debris and materials, designated route, designated elevator				
Workers removing coveralls in work zone before entering anteroom. Workers removing booties in ante room.				
Negative air fans working properly. No dust accumulation at exhaust location				
No signs of water leakage				
No signs of vermin – insects, birds, mice, squirrels				
No food trash found in work zone, or cavities in the work zone				
All workers Safety and ICRA trained				
Other observed or reported problems:				

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ATTACHMENT F: INFECTION PREVENTION AND CONTROL DURING  
CONSTRUCTION PAMPHLET

Keeping Veterans Safe

*The goal of the Infection Control Program is to identify and reduce the risks of acquiring and transmitting infections among patients, employees, and visitors.*



Each project requires an Infection Control Risk Assessment (ICRA) in which the class is determined. These are just a few examples of each class and what type of projects may be included.

Class I includes inspection and non-invasive activities, e.g., minor trim work.

Class II includes small scale, short duration activities that create minimal dust, e.g. installation of telephone or computer cables.

Class III includes any work which generates a moderate to high level of dust or requires demolition or removal of any fixed components or assemblies, e.g., removal of floor coverings.

Class IV includes major demolition and construction projects.

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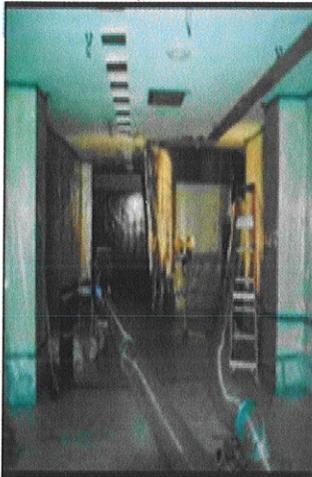
2004 Albany Post Road  
Montrose, NY 10548  
Phone: 914-737-4400

41 Castle Point Road  
Wappingers Falls, NY 12590  
Phone: 845-831-2000

Infection  
Prevention and  
Control During  
Construction



# 11IC-05HV INFECTION CONTROL DURING CONSTRUCTION AND RENOVATION VA Hudson Valley Health Care System



## Why is Infection Control Important?

During construction, hidden infectious disease hazards may be present. A major concern for prevention of infection is dust containment. Dust may be carried in airborne particles or on shoes or clothing. Microscopic fungus such as *Aspergillus* may be found in plaster, drywall, settled dust and in the environment. These organisms usually do not cause problems in healthy people, but are of greater concern in a hospital. *Aspergillus* and other fungal organisms can cause illness and even death in patients who are already sick. Therefore, it is critical that everyone does their part to keep our veterans, employees, and visitors safe.

### Environmental Infection Control During Construction

- ◆ An Infection Control Risk Assessment (ICRA) is required before project is started.
- ◆ Appropriate barrier walls for dust control must be in place before any construction begins
- ◆ Appropriate personal protective equipment (PPE), such as goggles for eye protection, face mask or shield, shoe covers, and clean gown will be worn upon entering site.
- ◆ All PPE must be removed at the site of exit to prevent carrying dust to other areas within the facility. Clothes & shoes should be free of loose dust once PPE is removed.
- ◆ Walk-off mats must be placed at any entry/exit and must be changed frequently (checked at least twice daily) to prevent tracking of dust/debris into clean areas.
- ◆ During demolition activities, contractor MUST use a HEPA-equipped air filtration unit *24 hours per day* and dust should be vented to the outside of the building whenever possible.
- ◆ It may be necessary to isolate the HVAC system and/or cover duct work grills in the area where work is being done to prevent contamination of the duct systems

### Environmental Infection Control During Construction

- ◆ Contractors are responsible for keeping the construction areas and entrance/exit zones clean. This may include wet mopping and/or vacuuming with HEPA filtered vacuum at the end of each work day.
- ◆ No food or beverages should be taken into the construction area.
- ◆ Proper containment of construction waste (tightly covered container) is mandatory.
- ◆ The shortest exit route to the outside should be taken when construction waste is being transported, unless otherwise approved by the facility.
- ◆ Construction workers are required to provide documentation of TB screening before the project starts
- ◆ Exterior window seals are to be used to reduce the amount of outside excavation debris coming into the building (if digging outside of the hospital near windows)
- ◆ 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.
- ◆ Control, collection and disposal must be provided for any drain liquid or sludge found when demolishing plumbing.
- ◆ Keep the construction area clean on a DAILY basis
- ◆ Dust and dirt **must** be kept to a minimum within the facility to maintain a safe environment for our veterans
- ◆ An Infection Control Practitioner is available Monday-Friday (except holidays) 8:00 AM to 4:30 PM at 845-631-\_\_\_\_\_/3096 (Castle Point) or 914-737-2291 (Montrrose) if there are infection prevention concerns.

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**SOP 138-22HV**

**CONSTRUCTION STANDARD PROCEDURES QUALITY ASSURANCE FOR PROJECTS**

**VA Hudson Valley Health Care System**

**Issue Date: 5/3/2019**

**Update: 5/3/2022**

1. **PURPOSE:** To define the responsibilities for the Maintenance and Repair (M&R) Section and the Planning and Design Section relating to project planning and review.
2. **POLICY:** VA Hudson Valley Health Care System has established delineated responsibilities for the M&R Section and the Planning and Design Section related to project planning and review to ensure the provision of a substantial degree of quality assurance for projects.
3. **RESPONSIBILITIES:**
  - a. **The Chief, Engineering Service** is responsible for the implementation of this standard operating procedure.
  - b. **The Chief, Planning and Design Section** is responsible for:
    - 1) The development and accomplishment of all projects, including Recurring, Nonrecurring Maintenance (NRM), Minor Miscellaneous, Minor, and Major (delegated) Construction
    - 2) Informing the Maintenance General Foreman and Safety Manager (or designee) of projects to be developed and generally what type of information will be needed from each section
  - c. **The Maintenance and Repair Section** is responsible for providing essential technical input during all phases of projects. This input begins with the formulation of project scopes and continues with project design and construction.
  - d. **The Project Engineer** is responsible for:
    - 1) Developing the project scopes, justifications, cost estimates and drawings
    - 2) Ensuring the success of each project
4. **PROCEDURE:**
  - a. **General Processes:**
    - 1) Project Development includes the preparation of the scope and justification, detailed cost estimate and justification, and conceptual drawings. All projects, except Recurring Projects, are submitted to VA Central Office for funding.
    - 2) Project Design includes preparation of preliminary designs, working drawings and specifications.
    - 3) Documents are developed by Architectural Engineers (A/E) or in-house by Project Engineers.
    - 4) The M&R Staff provides input needed for this development including information on existing utilities, equipment, etc., justifications (for

## SOP 138-22HV

# CONSTRUCTION STANDARD PROCEDURES QUALITY ASSURANCE FOR PROJECTS

## VA Hudson Valley Health Care System

- maintenance projects) and recommendations for the type of new or replacement construction and mechanical/electrical systems to be installed.
- 5) The Project Engineers works with the General Foreman (or his designees) and Safety Section to obtain specific information required.
  - 6) The Project Engineers notify the General Foreman of any M&R input not to be incorporated in the project with an explanation.
  - 7) The Project Engineers contact the Industrial Hygienist and also look-up the Asbestos Assessment Report to incorporate all necessary Asbestos Abatement work as part of the project.
  - 8) The Safety Section assists the Planning and Design Section in project designs available in the project office.
  - 9) The Safety Section shall review the drawings and specifications and provides comments to the Project Engineer thru the Chief, Planning and Design Section.
  - 10) Projects are approved and funded based on information developed during this stage. The project scope will not be expanded, nor can the budget be increased after it is approved and funded.
  - 11) Project Engineers administer A/E design contracts or develop designs themselves as directed by the Chief, Planning and Design Section.
  - 12) The M&R Section provides technical input on existing and proposed utility systems, equipment and structural components necessary to successfully complete the designs.
  - 13) The Chief, Planning and Design Section informs the Chief, Engineering Service and Safety Manager of projects to be designed including information on scopes, budget, and time frames for design. Design time frames will appear on the project list and be updated and discussed at the monthly project meetings.
  - 14) For each project (contractor and station level), a Hazardous Evaluation Sheet must be filled out. An Infection Control Assessment Screen must be done for the project as well. This can be found in Infection Control Policy 11IC-05HV. For all projects, contractor or station level, Infection Control Policy 11IC-05HV will be strictly followed. If the Class of Precautions are three or higher, Infection Control approval will be required for the construction activity. These results will be documented on the Hazardous Evaluation Sheet (Attachment D).
  - 15) For those projects that require excavation, a Dig Permit will be required (Attachment E).

### b. Specific Processes:

#### 1) Design Stages:

- a) Pre-design Meeting - M&R Staff and Safety Section Staff will participate in a pre-design meeting called by the Engineer. They will have an opportunity to discuss existing problem areas; e.g.; an electrical system loaded beyond capacity, asbestos issues, make recommendations to correct deficiencies, and request specific design strategies.

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- b) Investigation of existing conditions- the M&R Section assist in providing information on existing construction, systems and equipment to the Engineer.
  - c) Inquires may take the form of meetings, walk-thru, conversations and written requests for information.
  - d) The Safety Section will participate in all design review meetings called by the Project Engineer.
  - e) Attachment #D will be filled out during design stage.
- c. Reviews
- 1) Engineers will inform the General Foreman of project reviews using the Review Request Format (Attachment A). Review materials will be available to the M&R Section staff as directed by the General Foreman.
  - 2) Materials to be reviewed will be developed to the extent required by the A/E contract for each review. This information will be described in the Review Request.
  - 3) Time frames for review will be noted on the Review Request form.
  - 4) M&R Section review comments will address the accuracy of existing conditions and technical acceptability of proposed solutions. They will be forwarded to the Project Engineer from the General Foreman using the Review Comment Format (Attachment B).
  - 5) M&R Staff shall, if requested, participate in design review meetings called by the Project Engineer to discuss comments and answer questions.
  - 6) The Project Engineer will notify the General Foreman of any M&R comments not to be incorporated into the design, with explanation.
  - 7) The Safety Office review comments will address the existing conditions as well as the new conditions created as a result of the proposed project.
- d. Project Construction
- 1) Project Engineers will administer construction contracts, as directed by the Chief, Planning and Design Section.
  - 2) The Project Section will make inspections with M&R Section assistance to identify deficiencies in materials and workmanship. The M&R Section provides other technical assistance as necessary.
  - 3) The Project Engineer will notify the General Foreman and Safety Office seven (7) days prior to formal inspections; i.e., rough-in, final, system tests, etc. Equipment manuals will be furnished to the M&R Staff at this time if they are available. The M&R Staff shall complete their inspection prior to the formal inspection.
  - 4) In addition to the formal inspections, the M&R Staff and Safety Office are encouraged to inspect all construction at anytime, as their schedules permit. Arrangements shall be made with the Project Engineer.
  - 5) Deficiencies identified shall be forwarded in writing to the Project Engineer, with copies to the Chief, Planning and Design Section.

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- 6) The Project Engineer shall notify the General Foreman of M&R identified deficiencies not to be corrected with an explanation.
  - 7) Before re-inspections by M&R staff are scheduled, the Project Engineer will determine if previously identified deficiencies have been corrected.
  - 8) The M&R Staff shall provide technical support as required. This includes providing information on existing conditions, attending meetings to resolve disputes, etc.
  - 9) Project Engineers and M&R Staff shall ensure compliance with Construction Safety and Legionella Directives in regard to safety and notifications.
- e. Project Close Out Meeting
- 1) The meeting will be scheduled by the Project Engineer to give a final review of the project.
  - 2) The Project Engineer will give a summary of project's accomplishments.
  - 3) The remaining deficiencies will be identified, and suggested course of action will be given.
  - 4) The areas of improvement for future projects will be discussed.
- f. General Responsibilities:
- 1) The Project Section Contracting Officer Representative (COR) will maintain a file for each assigned project.
  - 2) The Project Engineer, Construction Representative, or Engineering Technician will complete Attachment C, and forward all technical manuals and shop drawings to the Maintenance General Foreman for each piece of equipment installed or removed under the project.
  - 3) Problems not resolved between the Project Engineer and M&R Staff will be referred to the next level of supervision in the appropriate section.
  - 4) Attachment #F will be filled out by the appropriate engineering personnel for the proper notification of "Planned Electrical Outages".
  - 5) An Electrician will be assigned to each patient care area to spot check the affected unit during the outage on a case by case basis to assist with any issues.

**5. REFERENCE/S:**

- 11IC-05HV: Infection Control During Construction & Renovation

**6. RESCISSION: SOP 138-22HV Construction Standard Operating Procedures Quality Assurance for Projects, issued March 3, 2016**

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JOHN CLIFFE  
Chief, Engineering Service  
Attachments:

- Attachment A: Review Request Format
- Attachment B: Review Comment Format
- Attachment C: Equipment Installed Under Construction
- Attachment D: Hazard Evaluation
- Attachment E: Dig and Excavating Permit Request
- Attachment F: Electrical Outage Checklist

Originator: 138/MR  
Distribution: WEB page

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Attachment "A":



SOP-138-22a.doc

Attachment "B":



SOP-138-22b.doc

Attachment "C":



SOP-138-22c.doc

Attachment "D":



Attachment D.doc

Attachment "E":



SOP-138-22e.doc

Attachment "F":



Electrical Outage  
Checklist 2-12-16.doc

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**Attachment "A"**

Date:

From: Project Engineer (138)

Subject: Project Review Request

To: General Maintenance/Repair Foreman (138B)

Thru: Chief, Project Section

1. Project Number: \_\_\_\_\_

2. Project Title: \_\_\_\_\_

3. Project Category: \_\_\_\_\_

4. Review Stage:

a. 50% Preliminary \_\_\_\_\_ c. 50% Working Drawing \_\_\_\_\_

b. 100% Preliminary \_\_\_\_\_ d. 100% Working Drawing \_\_\_\_\_

e. Other \_\_\_\_\_

5. Review Materials:

a. Narrative \_\_\_\_\_ c. Specifications \_\_\_\_\_

b. Drawings \_\_\_\_\_ d. Calculations \_\_\_\_\_

e. Other \_\_\_\_\_

Note: Attached is a copy of the A/E submission for the project mentioned to be reviewed.

\_\_\_\_\_  
PROJECT ENGINEER

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**Attachment "B"**

Shop Foreman (138\_\_\_\_)

Project Review Comments

Project Engineer (138\_\_\_\_)

Thru Chief, Project Section

1. Project Number: \_\_\_\_\_
2. Project Title: \_\_\_\_\_
3. Review Stage: \_\_\_\_\_
4. Comments: (NOTE: Comments should reference specific specification section or drawing number.)

---

SHOP FOREMAN (138\_\_\_\_)  
cc: M&R General Foreman (138B)

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**Attachment "C"**

**EQUIPMENT INSTALLED UNDER CONSTRUCTION**

PROJECT: \_\_\_\_\_

Device Name: \_\_\_\_\_

Owning Service: \_\_\_\_\_

Location: Bldg #/Room #: \_\_\_\_\_

Model # \_\_\_\_\_ Serial # \_\_\_\_\_

Acquisition Date: \_\_\_\_\_ Acquisition Value: \_\_\_\_\_

Warranty Expirations: \_\_\_\_\_

P.O. # \_\_\_\_\_ Contract # \_\_\_\_\_

Maintenance Manuals are attached:

P.M. Frequency

**SPECIAL REMARKS:**

Attachment "D"

**HAZARD EVALUATION**

<b>Project Title:</b> New Community Living Center	<b>Project Number:</b> 620-334
<b>Campus:</b> Montrose Bldg: CLC <b>Rm:</b>	<b>COR:</b> Erik Anderson

**Description of Project Key Activities:** Construct new small home Community Living Center

Section A:	Yes	No	Signature	Date
1. According to the most recent Asbestos Survey and additional testing results as required, is Asbestos Present?	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
2. Will lead be disturbed during work activities	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
3. Project has been discussed with GEMS Coord.	<input type="checkbox"/>	<input type="checkbox"/>		
4. Project has been discussed with Fire Chief, for Confined Space, Burn Permit, ILSM, Sprinkler, Smoke Detection	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
5. Project has been assessed for transmission of Tuberculosis (TB)	<input type="checkbox"/>	<input type="checkbox"/>		
6. Project has been discussed with SPS/SPD Managers	<input checked="" type="checkbox"/>	<input type="checkbox"/>		

Comments / Action / Follow Up:

**Section B: Check if utility is effected:**

- |   |  |                       |            |
|---|--|-----------------------|------------|
| <input type="checkbox"/> Heat                   | <input type="checkbox"/> Air Conditioning          | Shop Signature: _____ | Date _____ |
| <input type="checkbox"/> Water                  | <input checked="" type="checkbox"/> Steam          | Shop Signature: _____ | Date _____ |
| <input checked="" type="checkbox"/> Electricity | <input type="checkbox"/> Camera/                   | Shop Signature: _____ | Date _____ |
| <input type="checkbox"/> Elevators              | Card Access  | Shop Signature: _____ | Date _____ |
| <input type="checkbox"/> Medical Gases          | <input checked="" type="checkbox"/> Plumbing       | Shop Signature: _____ | Date _____ |
|   | <input checked="" type="checkbox"/> Waste (Sewage) |                       |            |

Comments / Action / Follow Up:

**Engineering General Foreman Signature:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Section C: The Project Does Impact: (check all that apply)**

- |  |   |
|--|---|
| <input checked="" type="checkbox"/> Air Quality/ Dust                  | <input checked="" type="checkbox"/> Excavation (Dig Permit)             |
| <input type="checkbox"/> Noise Level                                   | <input type="checkbox"/> Penetrations (Penetration Permit)              |
| <input type="checkbox"/> Vibration                                     | <input checked="" type="checkbox"/> Confined Space (Penetration Permit) |
| <input checked="" type="checkbox"/> Utility Services                   | <input type="checkbox"/> Lockout/Tagout                                 |
| <input type="checkbox"/> Emergency Procedures                          | <input type="checkbox"/> Fall Protection                                |
| <input type="checkbox"/> Structural Integrity                          | <input checked="" type="checkbox"/> ILSM                                |
| <input type="checkbox"/> Access to job site through patient care areas |   |
| <input type="checkbox"/> Disposal of debris through patient care areas |   |

Comments / Action / Follow Up:

**Project Engineer Signature:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Section D: Infection Control Risk Assessment**

**Class of Precautions :**     Class I     Class II     Class III     Class IV

Comments / Action / Follow Up:

**Infection Control Signature:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**SOP 138-22HV**  
**Construction Standard Operating Procedures Quality Assurance for Projects**  
**VA Hudson Valley Healthcare System**

**Attachment "E"**

**HVHCS FDR & CP Campus**  
**DIG AND EXCAVATING PERMIT REQUEST**  
(Electrical, water, gas, fiber optic, sewer, other)

**ANY PENETRATIONS INTO THE GROUND ON VA PROPERTY REQUIRES A DIG PERMIT**

When locating is COMPLETE, an APPROVED copy will be attached to the completed 138-022 Construction Safety form

Contact or Project Manager: \_\_\_\_\_ Phone # \_\_\_\_\_

Dig Location: \_\_\_\_\_ Start Date: \_\_\_\_\_

**A DRAWING WITH DIG LOCATION IDENTIFIED MUST BE ATTACHED**

(Drawings are available in the Engineering Office)

**DO NOT START** unless you have received an approved hard copy of this request.

Purpose for digging: \_\_\_\_\_

Section doing the digging: \_\_\_\_\_ Phone # \_\_\_\_\_

Certified Equipment operator: \_\_\_\_\_

Equipment to be used: \_\_\_\_\_

Is fence required: Yes: \_\_\_\_\_ No: \_\_\_\_\_

All excavation on the HVHCS Campuses will be performed following the OSHA Regulations (Standards - 29 CFR) Specific Excavation Requirements 1926.651. All excavation will also conform to the facility's trenching and excavation SOP.

There are also some Electrical, Fiber Optic and Cable TV conductors owned by private companies on campus. It is the responsibility of the Contact Person or Project Manager to contact the local utility companies to obtain an approved dig permit. Please contact the Engineering Program Manager with any questions.

PROJECT #/WORK ORDER #: \_\_\_\_\_

Area utilities located and identified by: \_\_\_\_\_ Date: \_\_\_\_\_

Electrical Supervisor approval: \_\_\_\_\_

Pipe fitter Supervisor approval: \_\_\_\_\_

Engineering Program Manager/Designee approval: \_\_\_\_\_

Comments: \_\_\_\_\_

**SOP 138-22HV  
Construction Standard Operating Procedures Quality Assurance for Projects  
VA Hudson Valley Healthcare System**

**Attachment F: Planned Electrical Outage Checklist**

**Electrical Outage Communication Checklist**                      **Date:** \_\_\_\_\_

**1. Facility and Location:** \_\_\_\_\_

**a. Date of Planned Outage:** \_\_\_\_\_ **Time of Outage:** \_\_\_\_\_ **Duration** \_\_\_\_\_

**b. Buildings/Areas Affected:**

<i>Building</i>	<i>Area</i>	<i>Point of Contact</i>

**2. Notifications:**

<i>Building/Area</i>	<i>POC</i>	<i>Office</i>	<i>Date</i>

Signs posted by engineering in impacted areas 48 hours prior to outage: Yes \_\_\_ No \_\_\_

**a. Supplies and/or Equipment required by engineering to support operations during outage:**

<i>Equipment/Supplies</i>	<i>Area required</i>

**3. Final checks after power is restored by Engineering:**

Air Conditioning - Electrical Panels - Fire Alarm Panels

Engineering POC \_\_\_\_\_ **Date:** \_\_\_\_\_

**4. After power outage review: Report any affected areas not planned on if applicable:**

**SOP 138-12HV**  
**DOMESTIC HOT WATER TEMPERATURE LIMITS**  
**VA Hudson Valley Health Care System**  
**Issue Date: December 13, 2017**  
**Update: June 20, 2020**

1. **PURPOSE:** To establish policy and procedures for domestic hot water temperature limits.
2. **POLICY:** Engineering Service has established mechanisms at this facility for domestic hot water temperature limits.
3. **RESPONSIBILITIES:**
  - a. **The Chief, Engineering Service** is responsible for implementing this policy.
  - b. **The Pipefitter Shop Foreman** is responsible for:
    - 1) Setting the temperature limits as per policy in all patient care areas
    - 2) Ensuring that temperatures are checked as indicated on a monthly basis in a report kept in the Engineering Service Office.
4. **PROCEDURES:**
  - a. Hot water storage tanks will be set at a minimum of 140 degree F. Tanks that do not have mixing valves will be set at 130 degree F.
  - b. Hot water heat exchangers will distribute water at 130 degree F to 150 degree F for patient buildings with Mixing Valves installed on every distal site. Until mixing valves are installed in the rest of the facility all other buildings will distribute water temperatures such that each distal site achieves a hot water temperature no greater than 110 degrees. Refer to Legionella Directive Facility Action Plan for scheduled completion dates of all other buildings in the program.
  - c. All sinks in patient areas will discharge hot water at a maximum temperature of 110 degrees F.
  - d. All patient showers and baths have anti scald devices.
  - e. Measures will also be taken to prevent scalding, including the testing of all hot water generating devices serving patient care areas on a monthly basis as well as a 10% representative sample of sinks on each patient ward. If a maximum temperature of 110 degree F cannot be maintained at the sinks corrective action will be taken and the device retested before placing the device back in service.
5. **REFERENCES:**
  - VHA Directive 1061, PREVENTION OF HEALTHCARE-ASSOCIATED LEGIONELLA DISEASE AND SCALD INJURY FROM POTABLE WATER DISTRIBUTION SYSTEMS

**SOP 138-12HV**  
**DOMESTIC HOT WATER TEMPERATURE LIMITS**  
**VA Hudson Valley Health Care System**

- TJC Comprehensive Accreditation Manuals, current edition.

6. **RESCISSIONS:** SOP 138-12HV: Domestic Hot Water Temperature Limits issued February 9, 2015.



**JOHN CLIFFE**  
Chief, Engineering Service

Originator: 138/JC  
Distribution: WEB

**SOP 138-13HV**  
**HOT WORK PROCEDURES**  
**VA Hudson Valley Health Care System**  
**Issue Date: 6/1/2018**  
**Update: 6/1/2021**

1. **PURPOSE:** To establish the responsibilities and procedures for performing hot work throughout the VA Hudson Valley Health Care System (VAHVHCS).
2. **POLICY:** The Engineering Service has established mechanisms to minimize the risk of fires during construction, alteration demolition operations or making repairs while performing hot work such as cutting, welding, thermal welding, brazing, soldering, grinding, thermal spraying, thawing pipe or any other similar work.
3. **RESPONSIBILITIES:**
  - a. The Chief, Engineering Service, as Safety Officer, is responsible for the implementation of this policy.
  - b. All Shop Supervisors are responsible for new employee training and annual refresher training and for ensuring that documentation of the training is forwarded to the Safety Officer.
  - c. Employees who cut, weld, braze, solder, grind, thermal spray, thaw pipes or perform other similar work where welding machinery, torches open flames, soldering irons or other similar devices are used, are responsible for following all required and established guidelines set forth in this policy.
  - d. Projects Personnel are responsible for:
    - 1) Ensuring that contractors are directed to report to the Fire Chief for review of established hot work procedures before any work commences.
    - 2) Ensuring that under no circumstances contractors are permitted to begin work until appropriate fire protection systems have been reviewed and fire alarm initiating devices are secured to prevent undesired fire alarms.
  - e. The Fire Department will be responsible for the follow-up.

4. **PROCEDURES:**

- a. The Fire Department will issue a hot work permit to the appropriate personnel. The permit will apply only to the area specified and only for the date and time specified. All requirements on the permit must be met prior to the start of any burning, welding, cutting and brazing operations, etc., and the Fire Chief is responsible for overall hot-work supervision. The permit can be revoked at any time and all work stopped if any provisions of the permit are not complied with.
- b. Without the use of a hot-work permit, Engineering Service employees will be permitted to perform hot work only in their respective shop areas.

**SOP 138-13HV**  
**HOT WORK PROCEDURES**  
**VA Hudson Valley Health Care System**

- c. Welding or burning operations will be under the Job-Site control of a competent Journeyman Craftsman/Technician who will ensure that all requirements pertaining to welding and burning operations are enforced.
- d. The requesting shop will provide a fire watch and fire extinguishing equipment. When work is being done on a deck, wall or ceiling, fire watches will be posted on both sides when fire hazards exist on both sides. The fire watch will remain at his station for a reasonable period of time (at least 30 minutes) after the job is completed and will ensure there are no live sparks or smoldering fires.
- e. The Safety Officer, Fire Chief, Safety Manager, Firefighters, Safety Specialists and Engineering Service Supervisors have the authority to stop hot-work operations that are being accomplished without a permit and such operations that do not meet the standards set forth in NFPA 51B, Standard for Fire Prevention During Welding, Cutting, and Other Hot Work.
- f. Operators of welding and/or cutting equipment will be properly instructed and qualified to operate such equipment. Instruction shall include all hazards peculiar to the operation.
- g. Welding and cutting operations will not be performed in or on the outer surfaces of rooms, compartments or tanks, or in areas adjacent to rooms, compartments or tanks, in or on closed drums, tanks or other containers which hold or have held flammable or explosive materials, liquids or vapors, unless, and until, fire and explosive hazards have been eliminated according to the applicable procedures specified in NFPA 241, Standard for Safeguarding Construction, Alteration, and Demolition Operations.
- h. All compressed gas cylinders will be handled carefully. Mapp gas, acetylene and oxygen cylinders, including those portable-welding rigs, shall be secured in place.
- i. Oxygen cylinders will be kept free of oil and grease at all times. A high-pressure leak from an oxygen cylinder may cause a sufficient amount of rapid oxidation to ignite nearby gasoline, oil, grease or alcohol and result in fire or explosion.
- j. While hot-work equipment is in use in confined spaces, mechanical ventilation will be provided to prevent accumulations of toxic vapors and/or fumes. Equipment will be frequently inspected for evidence of leaks in the hose, couplings, valve stems or other points of the system. If leaks are not promptly detected and explosive or lethal mixture of gas and air may accumulate with serious results.

**SOP 138-13HV**  
**HOT WORK PROCEDURES**  
**VA Hudson Valley Health Care System**

- k. When welding or cutting is being performed in any confined areas, except in an authorized welding shop (a permanent location designed or approved for hot work operations), the gas cylinders will be left on the outside unless specifically approved by either the Safety Officer or the Fire Chief.
- l. Where welding cable or hose is in the path of any traffic, it will be protected from chaffing damage by a protective wrap covering, properly secured by lines to prevent undue strain on cables or hose.
- m. When an operator using electric welding equipment has occasion to leave his work or stop work for an appreciable time, the power switch will be turned off. The equipment will be completely disconnected from the power source when not in use.
- n. If welding or cutting must be done in the vicinity of combustible materials, special precautions such as, but not limited to, those given in the following list will be taken to make certain that sparks or hot slag does not reach them and start a fire:
  - 1) Move combustible material to a safe distance (35 feet in all directions).
  - 2) Sweep floors clean.
  - 3) Station fire watch personnel near openings to warn passersby of sparks.
  - 4) Use sheet metal or fireproof curtains where needed.
  - 5) Ensure that guards and curtains are adequate.
  - 6) Ensure there are no openings between fireproof blankets (used as curtains) and the floor, because hot slag may roll along the floor.
- o. When it is necessary to do welding or cutting close or near to combustible material that cannot be removed or protected, class A extinguisher will be readily available.
- p. Whenever combustible materials have been exposed to molten metal or slag from cutting operations, the fire watch and welder/burner will be sure that smoldering fire has not been started.
- q. Mapp gas/acetylene hose shall be tested frequently for leaks. If mapp gas/acetylene has been escaping in confined areas, the areas will be properly cleared of all gas before welding or burning operations are again carried on.
- r. No mapp gas/acetylene torch will be left unattended while burning. When it is not being used, the hose will be coiled or looped in a workman-like manner and placed on a bracket at the cylinders and the pressure in the hose relieved by closing the valves on the cylinders and opening the valves on the torch. Lines left unattended during the meal times or other extended periods will be either removed from the compartment or disconnected at the cylinders.

**SOP 138-13HV  
HOT WORK PROCEDURES  
VA Hudson Valley Health Care System**

**5. REFERENCES:**

- NFPA 51B, Standard for Fire Prevention During Welding, Cutting, and Other Hot Work
- NFPA 101, Life Safety Code
- NFPA 241, Standard for Safeguarding Construction, Alteration, and Demolition Operations
- Joint Commission EC and LS Requirements
- VHA CEOSH Fire Safety Guidebook
- Master agreement between the Department of Veterans Affairs and the American Federation of Government Employees

**6. RESCISSION: SOP 138-13HV, Hot Work Procedures, Issued May 13, 2015.**



**JOHN CLIFFE**  
Chief, Engineering Service

Originator: 138F- EJB  
Distribution: WEB

**SOP 138-15HV**  
**SCAFFOLD AND LADDER REGULATIONS**  
**VA Hudson Valley Health Care System**  
**Issue Date: 4/13/2018**  
**Update: 4/13/2021**

1. **PURPOSE:** To delineate guidelines for safe use of scaffolds and ladders.
2. **POLICY:** Engineering Service has established mechanisms to ensure the safe use of scaffolds and ladders.
3. **RESPONSIBILITIES:**
  - a. **The Chief, Engineering Service** is responsible for the implementation of this policy.
  - b. **The Supervisors** are responsible for:
    - 1) Insuring that work being performed on scaffolds and ladders adheres to the safe practices and procedures listed below.
    - 2) Ensuring that all ladders and scaffolds are properly maintained.
  - c. **Employees** are responsible for:
    - 1) Inspecting scaffolds and ladders prior to and after every use and for reporting unsafe conditions to their Supervisor.
    - 2) Employing the safe practices and procedures listed below.
4. **PROCEDURE:**
  - a. Employees will perform their work in conformance with universally accepted and established safety practices.
  - b. Negligence or willful violation of the regulations as contained in this standard operating procedure will be considered just cause for disciplinary action as deemed appropriate and applicable.
  - c. **Rolling Scaffolds:**
    - 1) Lock all caster brakes when the scaffold is in a working position.
    - 2) Make sure that the height of the working platform is no more than three to four times the smaller base dimension.
    - 3) Have and utilize sufficient help when rolling the scaffold.
    - 4) On a rough surface, never move a work platform with anyone on it. Never move an occupied work platform sideways. All personnel must be off a work platform before it is moved in any direction, no matter how short the distance.
    - 5) Do not fully extend leg-leveling screws.
    - 6) Take precautions to prevent the scaffold from being struck by trucks or other moving equipment. Appropriate warning signs will be posted or an individual(s) will be assigned to stand guard in the immediate area, and warn all individuals.

**SOP 138-15HV**  
**SCAFFOLD AND LADDER REGULATIONS**  
**VA Hudson Valley Health Care System**

- 7) Always use guardrails around all exposed sides of working platforms. These guardrails should be between 36 and 42 inches above the platform.
- 8) Make sure that working platforms are equipped with special fittings or cleats or have other provisions to prevent their movement.
- 9) Toe boards are required for all scaffolds over 10 feet high. They should be at least 1 x 6 inches and installed tightly to the platform. When scaffolds are erected above walks or work areas, the space between toe and board and railing should be screened.

d. Ladders Placement:

- 1) Place a ladder so that the horizontal distance from the base to the vertical plane of the support is approximately one-fourth the ladder length between supports.
- 2) Do not use ladders in a horizontal position as runways or as scaffolds.
- 3) Do not place ladder in front of a door that opens toward the ladder unless the door is locked, blocked or guarded, or an individual is posted to prevent others from going through the doorway.
- 4) Never place a ladder against a window pane or sash.
- 5) Place a portable ladder so that both side rails have secure footing. Provide solid footing on soft ground to prevent the ladder from sinking.
- 6) Place ladder feet on a substantial and level base, not on moveable objects.
- 7) Never lean a ladder against unsafe backing such as boxes or barrels.
- 8) When ladder is used for access to high places, securely lash or otherwise fasten the ladder to prevent slipping.
- 9) Secure both bottom and top to prevent displacement when using ladder for access to a scaffold, and extend the ladder side rails at least 3-1/2 feet above the top landing.
- 10) Do not place a ladder close to live electric wiring or against any operational piping (acid, chemical, sprinkler system) where damage may be done.
- 11) Ascending or Descending Ladders:
  - a) Hold on with both hands when going up and down. If material must be handled, use a rope.
  - b) Always face the ladder when ascending or descending.
  - c) Never slide down a ladder.
  - d) Be sure shoes are not greasy, muddy, or slippery before climbing.
  - e) Do not climb higher than the third rung from the top on straight or extension ladders, the second tread from the top on stepladders.
  - f) Whenever any individual is ascending or descending a ladder, the ladder will be properly footed.

e. Other Safe Practices:

- 1) Do not use makeshift ladders or utilize other devices such as chairs, tables, counter tops, etc., to gain access to high places.
- 2) Make sure stepladder is fully opened before you start to climb it.

**SOP 138-15HV**  
**SCAFFOLD AND LADDER REGULATIONS**  
**VA Hudson Valley Health Care System**

- 3). Before using a ladder, inspect it for defects. Examine the rungs, or rails for burrs and the rope for deterioration.
- 4) Never use a defective ladder. Tag or mark such ladder for repair or destruction as applicable, and immediately notify your Supervisor to have it taken out of service.
- 5) Keep ladders clean and free from dirt and grease, which might conceal defects.
- 6) Do not use ladders during a strong windstorm, except in an emergency, and then only when they are securely tied.
- 7) Do not leave ladders unattended, unless anchored at the top and bottom.
- 8) Do not use metal ladders around electrical circuits or in places where they may come in contact with live circuits, since metal ladders are electrical conductors.
- 9) Inspect all ladders immediately before each use for any possible damage/defects. All items found with damage/defects, the individuals utilizing the ladder will initiate immediate corrective action.

**5. REFERENCES:**

- Occupational Safety and Health Standard 29 CFR 1920-1926.

**6. RESCISSION:** SOP 138-15HV: Scaffold and Ladder Regulations, dated February 25, 2015.



**JOHN CLIFFE**  
Chief, Engineering Service

Originator: 138JD  
Distribution: WEB

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SOP: 138-58HV

## CHILLED/HEATING HOT WATER GENERATION & DISTRIBUTION SYSTEMS

VA Hudson Valley Health Care System

Issue Date: 9/14/2017

Update: 9/14/2020

1. **PURPOSE:** To provide an efficient chilled water (A/C) and hot water (heating) system at the Castle Point Campus.
2. **POLICY:** Engineering Service at the VA Hudson Valley Health Care System has established mechanisms to generate and distribute controlled chill water in summer and hot water heating in the winter at the Castle Point Campus.
3. **RESPONSIBILITIES:**
  - a. **Chief Engineering Service** is responsible for the implementation of this policy.
4. **PROCEDURES:**
  - a. The Castle Point Campus has a “dual temperature” or two (2) pipe system. The System operates in two modes (summer mode and winter mode).

### Summer Mode:

- 1) Chilled water generated by chillers is pumped in a primary loop in Building 35 by chilled water pumps, 525 Gallons per Minutes (GPM) each.
- 2) Three (3) secondary loop chilled water pumps circulate chilled water to Buildings 15,16,17,18,19,20 and 21.
- 3) Each building loop supplies chilled water to air handler cooling coil and room fan coil units by two (2) building dual temperature water pumps controlled by the Building Automation System.
- 4) The Chilled Water Generation System consists of:
  - a) Two (2) 350 ton York Centrifugal Chillers;
  - b) One (1) 400 ton McQuay Steam Absorption Chiller;
  - c) One (1) Plate Heat Exchanger;
  - d) Two (2) 400 ton Marley cooling towers;
  - e) One (1) 450 ton Marley cooling tower;
  - f) Two (2) 1,050 GPM condenser water pumps;
  - g) Two (2) automatic bleed/chemical feed systems;
  - h) The Genital Urology (GU) and Lab have back up water chillers;
- 5) This system is controlled by the Johnson Control building automation system
- 6) Chiller #1 is a York “turbo modulator” vary-speed drive and is used under light load conditions.
- 7) At the discretion of the operators, chiller #1 and #2 are put on the line to function automatically.
- 8) This system is redundant at less than full load.
- 9) Condenser water pumps circulate condenser water between chillers and cooling towers.
- 10) Automatic bleed/chemical feed system adds chemicals and open bleed solenoid valve to maintain water conditions.

**SOP: 138-07HV**  
**ENGINEERING SERVICE CONTROL OF SERVICE EQUIPMENT USE**  
**VA Hudson Valley Health Care System**

- 11) Pneumatic condenser water temperature control panel maintains temperature by starting and stopping two high and low speed fans in the cooling towers.
- 12) With air handler steam coil valves shut, H-wing has a four (4) pipe system so the building has a chilled water loop to supply air handlers and fan coils units by two (2) chilled water pumps.
- 13) Lab is an air only system.
- 14) Hot water re-heats maintain set room temperature year round.
- 15) Steam-fed converters supply pumped hot water to re-heat in a closed system.

Winter mode:

- 1) During winter mode, chilled water pumps are shut down.
- 2) Building temperature control valves switch to heating.
- 3) The building loop pumps continue and steam hot water converters become active and heat building loop water to an outside air adjusted temperature to supply fan coil units and convectors.
- 4) Air handler steam coil valves modulate to control supply air temperature.

Partial Isolation of Buildings:

- 1) Chilled water mains have isolation valves at each supplied building.
- 2) Dual Temperature water zones can be valved off in each building supplied.

Failure:

- 1) Chilled water generation system is on emergency power so chilled water distribution is effective during power failure.
- 2) All heating water equipment is on emergency power.

Preventive Maintenance Inspection:

- 1) This equipment is inspected and reported on monthly PMI work order.
- 2) Chillers and chemical systems are visually checked hourly during the first shift while in operation except weekends and holidays.
- 3) Daily logs are taken of all readings, i.e., temperatures and pressures except weekends and holidays.
- 4) Chillers are serviced and inspected under a service contract.
- 5) Cooling towers are inspected daily during operation except weekends and holidays.
- 6) Monthly reports are sent to the PMI system.

5. **REFERENCES:** The Joint Commission Environment of Care Standards
6. **RESCISSION:** SOP 138-58HV: Chilled/Heating Hot Water Generation & Distribution Systems issued 2/6/2014

**SOP: 138-07HV  
ENGINEERING SERVICE CONTROL OF SERVICE EQUIPMENT USE  
VA Hudson Valley Health Care System**



**JOHN CLIFFE**  
Chief, Engineering Service

Originator: 138/JD  
Distribution: WEB

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**SOP 138-60HV**  
**ENGINEERING SERVICE INFECTION CONTROL POLICY**  
**VA Hudson Valley Health Care System**  
**Issue Date: 5/3/2019**  
**Update: 5/3/2022**

1. **PURPOSE:** To delineate specific Infection Control policies and procedures in order to reduce/prevent the transmission of infection in Engineering Service.
2. **POLICY:** Engineering Service has established mechanisms to ensure adherence to facility-wide and departmental Infection Control policies and procedures approved by the Infection Control Committee.

3. **RESPONSIBILITIES:**

- a. **The Chief, Engineering Service** or his designee is responsible for:
  - 1) Ensuring Infection Control education and required Occupational Safety & Health Administration (OSHA) training is provided to Engineering staff members (via computer or other method)
  - 2) Ensuring attendance of Engineering staff members to the provided training
  - 3) Ensuring Engineering staff adhere to all policies and procedures pertaining to Infection Control.
  - 4) Reviewing and updating Infection Control policies and procedures as needed and submitting them to the Infection Control Committee for approval
- b. **Engineering Service Employees** are responsible for:
  - 1) Adhering to facility-wide and Engineering Service Infection Control policies and procedures
  - 2) Providing the Chief, Engineering Service with all pertinent data regarding possible infectious disease exposure
  - 3) Attending Infection Control education and OSHA training as required

4. **PROCEDURE:**

- a. Engineering staff members will comply with Standard Precautions/Transmission-Based Isolation/Precautions, the Exposure Control Plan, and the Tuberculosis Control Plan.
- b. If a Red Stop Sign (Airborne Isolation Sign, indicating infection spread by the airborne route) is attached to a patient's door, the engineering staff must follow the procedure as outlined in Policy 11IC-02HV: Standard Precautions/Transmission-Based Isolation/Precautions, and Policy 11IC-08HV: Tuberculosis Control Plan.
- c. Engineering staff members will comply with the Occupational Health Section Infection Control Policy.
- d. Repair of equipment (e.g.; toilets, sinks, etc.) in a room with an Isolation Sign will be accomplished only after determination is made that equipment cannot be

**SOP 138-60HV**  
**ENGINEERING SERVICE INFECTION CONTROL POLICY**  
**VA Hudson Valley Health Care System**

moved from the area. Equipment used by patients will be cleaned prior to any repair by Engineering Service personnel.

- e. Repair of equipment soiled with body fluids will be accomplished only after the equipment has been cleansed and disinfected by the Department Managers requesting the repair. Engineering Service will repair malfunctioning washers and dryers.
- f. Engineering Service will consult with the Infection Control Practitioner prior to designing or remodeling areas of the facility per Policy 111C-05HV: Infection Control during Construction and Renovation.
- g. Eating or drinking in any patient area, the main kitchen, laboratory, or morgue is not permitted.
- h. Waste Water Treatment Plant personnel assigned to pick up and transport the bar screen residual material (in red bags) will wear heavy-duty gloves when handling these bags using the following guidelines.
  - 1) Be careful not to break open or tear any bags.
  - 2) Report any torn, leaking trash bags to supervisors.
  - 3) Wear a protective apron if the bags are leaking.
- i. Testing water for potability: Water samples will be collected monthly at random outlets and sent for analysis and testing. The service contractor personnel will take samples and keep appropriate records on file.
- j. Large amounts of waste from drains, toilets or other pipes removed during repair or cleaning will be placed into double red bags and discarded as infectious waste.
- k. Uniforms will be changed if contaminated with body substances and personnel are to shower before putting on clean cloths
- l. Sewers will be cleaned and follows:
  - 1) Maintenance and Repair Section personnel will use a face shield, goggles and heavy-duty rubber gloves. If there is a potential for clothing to be splashed by sewer material, protective aprons should be worn. Used items that cannot be cleaned and adequately decontaminated will be placed in red trash bags and discarded as infectious waste.
  - 2) Personnel with open wounds which cannot be completely protected will not clean the sewer.
  - 3) Equipment contaminated with sewer material will be placed in an EPA- approved disinfectant, soaked for the time recommended by the producer of the disinfectant removed, rinsed is necessary, and dried before storage.
  - 4) After equipment has been placed into the disinfectant, wash hands with soap and water. Wash hands again after placing equipment in storage.

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**ENGINEERING SERVICE INFECTION CONTROL POLICY**  
**VA Hudson Valley Health Care System**

- 5) Change uniform as necessary.
- m. Inspection and repair of the morgue is accomplished as follows:
  - 1) Never eat or drink in the morgue.
  - 2) Repairs of other equipment, pipes, drains, etc. will be done as already described, using care to prevent contact of body substances with skin or clothing.
- n. Employees who have a potential for exposure to bloodborne pathogens will be offered the Hepatitis B vaccine. Refusal of the vaccine will require the completion of a declination form.
- o. Negative Pressure Rooms:
  - 1) Employees repairing negative pressure ventilation ducts while the room is occupied will wear approved respiratory protection during the time they are repairing the duct.
  - 2) All ventilation ducts in rooms producing a negative pressure will be sealed at joined sections.
  - 3) Smoke tube testing will be conducted daily by A/C Shop personnel when negative pressure rooms are occupied by patients known or suspected of having tuberculosis or other airborne disease.
- p. Cleaning Ice/Water Machines:
  - 1) Fill a clean five-gallon pail two-thirds full of water.
  - 2) Add germicidal detergent according to the manufacturer's instructions.
  - 3) Use a clean cloth to wash all exposed surfaces thoroughly, including the chute, spout, grille, splash panel, and tray. Use protective equipment to prevent irritation. (Refer to the SDS for precautionary measures.)
  - 4) Rinse thoroughly with clean water.
  - 5) Inspect, test, adjust and clean all components, including changing of filters, removal and cleaning of the storage bin.
  - 6) The drains and storage bins will be cleaned with detergent and water, and diluted chlorine solution (one-part bleach to 500 parts water).
  - 7) These parts will be rinsed thoroughly with water after cleaning. \
  - 8) The first batch of ice made after cleaning will be discarded.

**5. REFERENCES:**

- 11IC-02, Standard Precautions/Transmission-Based Isolation Precautions Occupational Health Section Infection Control Policy.
- 11IC-04, Exposure Control Plan.
- 137-07HV, Management of Regulated Medical, Hazardous Chemical, Radioactive, and Other Solid (Routine) Wastes
- 11IC-08, Tuberculosis Control Plan

**SOP 138-60HV  
ENGINEERING SERVICE INFECTION CONTROL POLICY  
VA Hudson Valley Health Care System**

6. **RESCISSION**: SOP 138-60HV: Engineering Section Infectious Control Policy, issued February 25, 2016.



**JOHN CLIFFE**  
Chief, Engineering Service

Originator: 138/JD  
Distribution: Web page

**SOP 138-62HV**  
**HOUSEKEEPING/SAFETY ON CONSTRUCTION PROJECTS**  
**VA Hudson Valley Health Care System**  
**Issue Date: 5/6/2019**  
**Update: 5/6/2022**

1. **PURPOSE:** To establish policy for housekeeping/safety on construction projects.
2. **POLICY:** VA Hudson Valley Health Care System (HVHCS) has implemented mechanisms to ensure housekeeping and safety on construction projects according to defined regulations.
3. **RESPONSIBILITIES:**
  - a. **The Chief, Engineering Service** is responsible for the implementation of this standard operating procedure (SOP).
  - b. **The Construction Site Project Engineer** is designated as the VA Construction Safety Officer and is responsible for:
    - 1) Enforcing all safety of VA employees, visitors, patients, and the contractor's employees
    - 2) Consulting with the in-house Safety Specialist on complex matters
    - 3) Ensuring immediate action is taken to correct all noted violations of safety and health regulations that are brought to the attention of the Contractor
    - 4) Notifying the Contracting Officer with cited violation and referencing it to the appropriate Occupational Safety & Health Administration (OSHA) Safety and Health Regulation for Construction, National Fire Protection Association (NFPA) 241, or other applicable regulations, if corrective action is not taken promptly
    - 5) Assuring that Section 010000 General Requirements is included in every specification and adhered to
  - c. **The Contractor** is responsible for:
    - 1) Maintaining a clean and safe environment of the construction project
    - 2) Following the procedures of this SOP as enforced by the Project Engineer and the Safety Officer
4. **PROCEDURE:**
  - a. During all phases of construction or alternations of buildings, the level of life safety will not be diminished unless scheduled and approved by the VA HVHCS.
  - b. The Contractor will, at all times, keep the work area, including storage areas, free of safety hazards and accumulations of waste materials.
  - c. The Contractor will comply with NFPA 241, Standard for Safeguarding Building Construction and Demolition Operations and all OSHA regulations.

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**HOUSEKEEPING/SAFETY ON CONSTRUCTION PROJECTS**  
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- d. The Contractor will perform the following:
- 1) Clean up their work area at the end of each workday.
  - 2) Work in a safe manner and take all the proper precautions while performing his work; extra precautions around persons occupying the building during construction
  - 3) Make safety inspections
  - 4) Provide proper protection for their employees
  - 5) Post appropriate signs in specific hazardous areas
  - 6) Secure windows and access door to roofs to eliminate the possibility of patients jumping through windows or from roof
  - 7) Adhere to Specification Section 010000 General Requirements

**5. REFERENCES:**

- The Joint Commission Comprehensive Accreditation Manuals, current edition
- NFPA Standards
- OSHA Regulations

- 6. RESCISSION:** SOP 138-62HV: Housekeeping/Safety on Construction Projects, issued April 21, 2016



**JOHN CLIFFE**  
Chief, Engineering Service

Originator: 138/MR  
Distribution: WEB page

**VA Hudson Valley Health Care System**

**Asbestos Permit**

<b>Campus</b>	<b>Building :</b>	<b>Room:</b>	<b>Date:</b>
<b>Current use of room:</b>			
<b>Type of abatement to be done:</b> <input type="checkbox"/> Clean up <input type="checkbox"/> Encapsulate <input type="checkbox"/> Removal			
<b>Type of ACM:</b> <input type="checkbox"/> Pipe lagging <input type="checkbox"/> Floor tile <input type="checkbox"/> other: _____			
<b>Amount to be disturbed:</b>	<input type="checkbox"/> < 10 sq. ft.	<input type="checkbox"/> > 10 sq. ft.	other:
	<input type="checkbox"/> <25 ln ft.	<input type="checkbox"/> >25 ln ft.	
Amount:      Amount:			
*PACM is indicated on most recent Asbestos Site Survey as + <input type="checkbox"/> yes <input type="checkbox"/> no			
PACM has been sampled and analyzed by a certified Asb. Inspector or laboratory <input type="checkbox"/> yes <input type="checkbox"/> no      If yes indicate sample ID			
<b>Abatement is to be done by licensed:</b>			
<input type="checkbox"/> in-house VA employees			
<input type="checkbox"/> Outside contractor: If outside contractor indicate Project #:			
<b>If in-house abatement, ID the workers involved in the project (Super/Handler/Monitor)</b>			
<b>If outside contractor used: Name Asbestos Contractor and CIH - Project Monitor</b>			
Anticipated Start Date of Abatement: _____ Anticipated End Date of Abatement: _____			
<b>In House Abatement Pre Project Plan Review conducted by:</b> (indicate employee names)			
Project Eng.: _____		Asbestos Handler: _____	
Asbestos Super. : _____		Safety Representative: _____	
Date: _____			
<b>Equipment /Preventative Measures Required</b>			
<input type="checkbox"/> Evacuate and Isolate Immediate Area	<input type="checkbox"/> GFCI	<input type="checkbox"/> Framing Materials for containment	<input type="checkbox"/> Disposal Bags <input type="checkbox"/> Monitoring - personal -area
<input type="checkbox"/> Post Signs	<input type="checkbox"/> Ammended Water	<input type="checkbox"/> Negative Air Scrubbers	<input type="checkbox"/> Fire Extinguisher <input type="checkbox"/> Mastic Remover
<input type="checkbox"/> Barrier Tape	<input type="checkbox"/> Glovebag	<input type="checkbox"/> HEPA Vacuums	<input type="checkbox"/> Tyvek Suits
<input type="checkbox"/> Isolate Air Handlers	<input type="checkbox"/> Encapsulant - Bridging Penetrating	<input type="checkbox"/> Decon Shower/ water filter	<input type="checkbox"/> Spray Adhesive
<input type="checkbox"/> Isolate Electrical Systems	<input type="checkbox"/> Enclosure /Containment	<input type="checkbox"/> Respirators :	<input type="checkbox"/> 1/2 Face <input type="checkbox"/> Full Face <input type="checkbox"/> APR Hd <input type="checkbox"/> APR FF
<b>Sampling Required:</b>			
<input type="checkbox"/> Background	<input type="checkbox"/> Air Exhaust	<input type="checkbox"/> Other	
<input type="checkbox"/> Work Area	<input type="checkbox"/> Outside Area	Sampling conducted by: _____	
<input type="checkbox"/> Personals	<input type="checkbox"/> Clearance		
Sampling results to be attached to Work Permit following completion of job			
<b>ACM DISPOSAL</b>			
Final amount of ACM removed for disposal (required by EPA and NYSDOL) _____			
The personnel below have reviewed the project & have agreed to follow the work plan			
Project Eng.: _____		Asbestos Handler: _____	
Asbestos Super. : _____		Safety Representative: _____	
Asbestos Permit. xlsx		<b>PERMIT # :</b> _____	

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**SOP 138-69HV**  
**FALL PROTECTION PROGRAM**  
**VA Hudson Valley Health Care System**  
**Issue Date: 1/24/2019**  
**Update: 1/24/2022**

1. **PURPOSE:** To establish guidelines to the fall protection of staff while performing routine maintenance and repairs throughout the VA Hudson Valley Health Care System (HVHCS).
2. **POLICY:** VA HVHCS has established mechanisms to ensure that an employee, when exposed to a fall hazard of six (6) feet or greater is protected from a fall. If employees are exposed to a fall hazard of 6 feet or greater, then guardrails, fall protection systems, or safety nets will be used when all other means have been explored, to eliminate the need for fall protection.
3. **RESPONSIBILITIES:**
  - a. **The Chief, Engineering Service** is responsible for:
    - 1) Identifying all known fall hazards in the workplace
    - 2) Ensuring that where a fall hazard exists, the hazard is eliminated or protection is provided against it by using safe-work practices and operating procedures, this will include fall protection systems such as the wearing of personal protection equipment
  - b. **The Safety Manager** is responsible for ensuring that the procedures of the Fall Protection Policy are implemented, and comply with Occupational Safety & Health Administration (OSHA), VHA guidelines, The Joint Commission Standards, and other applicable codes.
  - c. **Supervisors** are responsible for:
    - 1) Providing and documenting training in the proper use of the fall protection system
    - 2) Ensuring training on the care of the personal fall protection equipment and procedures
    - 3) Collaborating with workers to determine which fall protection system is best suited for each work environment task
  - d. **Workers** are responsible for:
    - 1) Identifying potential fall hazards
    - 2) Determining which fall protection system to use in work environments
    - 3) Utilizing approved anchoring procedures at locations established by Engineering/Safety
    - 4) Ensuring that regardless of the method used, inspection of fall protection components is conducted prior to each work shift and periodically during the course to the workday

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**4. PROCEDURE:**

- a. It is vitally important for all employees exposed to fall hazards to understand and utilize fall protection requirements, and to apply these rules to his or her work.
- b. VA HVHCS, Safety is everyone's responsibility. Proper Fall Protection requires the highest standard of uncompromised and strict safety consciousness. Anyone performing maintenance or repairs to the VA HVHCS will be held to these standards.
- c. Personal fall arrest systems will be used only as designed and intended. Any part of fall protection equipment that has been subjected to the stress of a fall will be removed from service
- d. Training:
  - 1) Training will be provided by a competent person and documented before authorizing employee being exposed to fall hazards and when a fall protection plan is utilized.
  - 2) The competent person will train employees in fall hazards associated with the tasks being performed, as well as the protection method.
  - 3) The competent person will have knowledge of the various fall protections being utilized as well as the knowledge and authority to make corrective change up to and including the stoppage of work.
  - 4) Training will be conducted annually and documented as part of each employee's mandatory training as part of their annual competency assessment. This record should contain the date and location of training, employee names and signatures and the name and signature of qualified trainer. Note: This training record should be maintained on site and be available for review.
  - 5) If at any time an employee is working in an unsafe manner, or if the standards of safe fall protection equipment change, then the employee will be required to be re-trained with appropriate action taken if working in an unsafe manner.
  - 6) Following intensive training on the selection and use of personal fall arrest systems, employees considered fully competent through instruction and actual demonstration will be allowed to perform maintenance and repairs in areas requiring fall protection.
  - 7) Employees will observe the buddy system, permitted to only work in groups of two or more at all times, and will utilize available communication devices to respond quickly in the event of a fall or event.
  - 8) Prior to work commencing that is discussed in this policy, notification will be provided to the Fire Department for their preparedness in the event of an emergency retrieval or assistance.
- f. Described below are the requirements and criteria for fall protection in workplaces when an unprotected side or leading edge, (an edge where a fall can

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occur), which is 6 feet (1.8m) or more above a lower level. Protection will be provided by the use of a guardrail system or personal fall arrest system under the OSHA standards. Safety-nets although approved under the OSHA standards are not typically used at the VA HVHCS as a means of fall protection, and are not discussed as part of this fall protection plan. Any fall protection procedure used must always afford the greatest level of protection to the worker even if other approved procedures are available. Required and provided Training/Protection as follows:

- 1) Ladders— Training is required for all employees who use or work on ladders. If total length of limb exceeds 24 feet, the fixed ladder must be equipped with ladder safety devices. Ladder safety devices can be self-retracting lifelines and rest platforms every 150 feet of vertical height, or cages or wells with landing platforms installed every 50 feet. Refer to: SOP 138-015HV: SCAFFOLD AND LADDER
- 2) Scaffolds – Training is required for all employees who use or work on Supported Scaffolds. Currently, OSHA requires guardrail protection when the deck height on a Scaffold exceeds 10 feet above adjacent surface. Guardrails are the preferred means of fall protections on a scaffold. If guardrails are installed, 4-inch toe-boards on all open sides should also be in place. If the openings between the scaffold and the work 14 inches then an independent personal fall protection system must be utilized. OSHA requires a Competent Person to supervise all erection, alteration and dismantling of scaffolding. Refer to: SOP 138-015HV: SCAFFOLD AND LADDER REGULATIONS and V.A. Construction Safety Guidebook Chapter 10 – Scaffolds and Aerial Lifts.
- 3) Powered Platforms, Manlifts, and Vehicle-Mounted Work Platforms - Training is required for all persons who work on any aerial lift which includes Scissors Lifts, and Articulating or Extended Boom Lifts, regardless of type or Manufacturer. The fall protection system, which consists of the guardrail system and personal protective device, includes full body harness with a lanyard and an attachment point inside the basket or platform. Both must be put in place before any lift is put into operation. Refer to: VA construction Safety Guidebook Chapter 10- Scaffolds and Aerial Lifts.
- 4) Maintenance and Repairs of Roofs - Each employee engaged in roofing activities on low-slope roofs of less a slope of 4 in 12 pitch, or higher pitched roofs with unprotected sides 6 feet or greater above lower levels will require guardrail systems or personal fall arrest systems, or a combination of warning line system and a guardrail system or personal fall arrest system. On low sloped roofs 50-feet or less in width, the use of a safety monitoring system alone is permitted. This is described in the standard for determining roof widths under the OSHA standard-29CFR 1926.501 (b) (10): Roofing work on low-slope roofs.
  - a) Work on pitched roofs will require fall protection systems consisting of various components but not limited to lifelines, and anchorage points. To perform any maintenance or repair fall protection the anchorage point and

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- life-support component must be set-up on the opposite side of the area where work will be performed. Procedures to set-up the lifeline must be verified by a competent person prior to work commencing depending on the scope of work planned.
- b) Work on flat roofs will require fall protections systems consisting of the same components. Anchorage points will be installed at points opposite the work area, and always at a point directly within reach upon entering the roof surface area. Anchorage points will be established either be a D-Ring or a cable. Both must be rated to support above 5,000 pounds capacity.
  - c) Anchorage points must be labeled with signage, and are not to be used for any purpose than an anchorage point designated for fall protection.
  - d) It is the standard to utilize the existing Steel I-Beam structure as the primary anchoring point for most of the work needing to be performed on pitched roof work. Where steel beams are not present, approved anchorage points utilizing approved D-Rings or cabling. The use of a nylon cross-arm strap is the only standard of connection between the anchoring point at steel I-Beams and life support lines.
- 5) Floor, Hole, and Manhole Openings - Holes also present a serious fall hazard. Generally, employees are not aware of floor holes so these fall hazards must be protected. Holes are described as penetration in the floor greater than 2 inches in diameter or width. Covers or guardrail systems must be in-place for each employee on a surface 6 feet or more above a lower level or from tripping or stepping into open holes (including skylights). Note: Excavations also present fall hazards. Temporary construction fence should be located at least 6 feet from the openings.
  - 6) Wall Openings - Employees shall be protected from falling by the use of a guardrail system or personal fall arrest system where the bottom edge of the wall opening is less than 3 inches above the walking / working surface. This includes window wall openings where demolition chutes may be attached.
  - 7) Hoist Areas - Employees are required to be protected from falling more than 6 feet to lower levels by guardrail systems or personal arrest systems. If guardrail systems are removed to facilitate the hoisting operation that may require an employee to lean through the access opening or over the edge of a roof, deck, scaffold or floor, then fall protection must be utilized.
  - 8) Falling Object Protection - Measures must be taken to keep minimize falling objects, and the potential to injure or harm others and the workers themselves. Such protection to the worker will be provided by wearing a hard hat and implementation of preventive measures including but not limited to toe-boards, screens, guardrail systems. The construction of a canopy structure below work area must be in-place should material be accidentally displaced must in-place in traffic areas. Barricades to prohibit others from entering a potentially hazardous area must described in the above standards of fall protection.

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- 9) Dangerous Equipment Protection - Employees less than 6 feet above dangerous equipment shall be protected from falling into or onto the dangerous equipment by guardrail systems or by equipment guards. Each employee 6 feet or more above dangerous equipment shall be protected from fall hazards by guardrail systems, personal fall arrest systems or safety net systems.
- 10) Testing Methods - Information regarding testing measures and results will be provided by the supplier based independent testing so that the employer and employee knows that the equipment meets the safety standard. This information should be kept on-file. Ideally, a personal fall arrest system is designed, tested and supplied as a complete system. Any substitution or change to a personal fall arrest system should be fully evaluated or by a competent person to determine that it meets the standard, before the modified system is put into use.
- 11) System Components of Fall Protection:
  - a) Guard Rail Systems: A guardrail is the most efficient method of fall protection, and should be the primary method of fall protection barrier to prevent employees from falling to lower levels. Regardless of the type used, the following provisions will be observed.
    - 1) Top edge height of top rails shall be 42 inches plus or minus 3 inches above the walking/working level.
    - 2) Mid-rails shall be installed between the top edge and the walking/working level when there is no wall or parapet wall at least 21 inches high.
    - 3) Toe-boards shall be a minimum of 3-1/2 inch in height.
    - 4) Guardrail systems shall withstand a force of at least 200 pounds from the top edge outward or downward.
  - b) Wood Railings - Stress-grade lumber posts at least 2-inch by 4 inches spaced not more than 8 feet apart on centers. The top rail shall be at least 2-inch by 4-inch and intermediate rail to be no less the 1-inch by 6-inch (all dimensions are nominal)
  - c) Pipe Railings - Posts, top rails and intermediate railing shall be at least one and one-half inches nominal diameter, (schedule 40 pipe) with posts spaced not more that 8-feet apart on centers.
  - d) Structural Steel Railings - Posts, top rails and intermediate rails shall be at least 2-inch-by-2-inch by 3/8-inch angles with posts spaced not more that 8-feet apart on centers.
- 12) Portable Warning/Barriers Systems - Create a visual warning system to the whole perimeter of the work area to identify dangerous areas that are a fall hazard. Visual warnings as follows:
  - a) When mechanical equipment is not being used, the warning line shall be erected no closer than 6 feet from the roof edge. If mechanical equipment is being used, the warning line shall be erected not less than 6 feet from the edge or the work area and erected parallel to the direction of the mechanical equipment operation being used.

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- b) Warning lines shall consist of rope, wire or chain shall have a minimum tensile strength of 500 pounds, and be flagged at intervals not more than 6 feet with high-visibility material.
- c) The stanchions shall be capable of resisting, without tipping over, a force of at least 16 pounds.
- d) The rope, wire or chain shall be rigged and supported in such a way that its lowest point (including sag) is no less than 34 inches from the walking/working surface, and its highest point is no more than 39 inches.
- e) In roofing work only, if an employee must work outside of the protected area then a safety monitor must be used. The safety monitor is responsible for the safety of the persons working outside the protected area and must be capable of communicating orally, be on the same surface and in the same area as the worker outside the warning line system, and cannot have any other responsibilities while monitoring workers outside the warning line system.

13) Personal Fall Arrest System (PFAS) – Consists of a Class 3 full body harness, a lanyard (maximum of 6 feet in length), and an attachment point. The anchorage point must be capable of supporting 5000 lbs. without failure. PFAS should not be confused with a body belt. Body belts are not approved for use as fall protection. Process to follow:

- a) The first component of the personal protective equipment is the full-body harnesses. These will be worn by workers during periods of fall protection.
- b) During the performance of fall protected work tasks, each employee is responsible to wear the most appropriate full-body harness for the task performed. Each employee will be issued a full-body harness with either a front mounted D-Ring, or a rear mounted D-Ring. Only the front or rear D-Ring will be used for fall arrest protection depending on the full-body harness worn. At no time will a side D-Ring be used as a system component of fall arrest protection. Side D-Rings may be used to offer additional positioning alternatives (positioning device) if provided as part of an unaltered full body harness.

g. Glossary of Terms:

- 1) ANCHORAGE – A secure point of attachment for life lines, lanyards or deceleration devices.
- 2) ARRESTING FORCE – The force transmitted to the body when a fall is arrested.
- 3) BODY HARNESS – A design of straps which is secured about a person in a manner to distribute fall arresting forces over at least the thighs, pelvis, waist, chest and shoulders, with provisions for attaching it to other components of a personal fall arrest system. Also known as a full-body harness.
- 4) BODY WEAR – The personal protective equipment worn by a worker, such as body belt or body harness.
- 5) CARABINER – A carabineer is used to connect retractable, fixed and adjustable lifelines to an anchorage point.

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- 6) **CHAFING GEAR** – Chafing Gear will be used at all points of contact where premature wear could occur. These points include, but are not limited to steel beams or columns used as anchorage points, window openings where lifelines or lanyards pass through and ridge caps or other obstructions where abrasion is possible.
- 7) **COMPETENT PERSON** – One who is capable of identifying existing and predictable hazards in the surrounding or working conditions which are hazardous, or dangerous to employees, and who has the authority to take prompt corrective measures to eliminate them.
- 8) **CONNECTING DEVICES** – Used to couple (connect) parts of the personal fall arrest system and positioning device systems together. (see Carabineer or lanyard).
- 9) **CROSS-ARM STRAP** – The cross-arm strap is used to provide a secure attachment point for lifelines and lanyards to an anchorage point. It is the standard to only use cross-arm straps when the anchorage point is around steel beams or columns. Additional chafing-gear is required if surface is sharp or abrasive. These straps are provided with D-Rings to attach.
- 10) **DANGEROUS EQUIPMENT** – Machinery, electrical equipment that may be hazardous to employees who fall onto or into such equipment.
- 11) **DECELERATION DEVICE** – A mechanism such as a rope grab, rip-stitch lanyard, and self-retracting lifeline designed to dissipate a substantial amount of energy during fall arrest. (see shock absorbers)
- 12) **LANYARD** – these are made either of fixed length or are adjustable. The lanyard is used to secure a full body harness directly to a point of anchorage or a lifeline connected to anchorage. The connection between points is made up with a self-closing double locking snap-hook.
- 13) **LEADING EDGE** – The outside edge of a floor, roof or walking/working surface.
- 14) **LIFELINE** – These are a flexible line for connection to an anchorage point to other components of a personal fall arrest system. Generally the connection between points is made up with a Carabineer. A lifeline is manufactured of 5/8 or 3/4" high quality nylon rope.
- 15) **PERSONAL FALL ARREST SYSTEM** – A system used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, and body harness which may include a lanyard, deceleration device or lifeline. As of January 1, 1998, the use of a body belt for fall arrest is prohibited.
- 16) **POSITIONING DEVICE SYSTEM** – Utilize a body belt with double D rings with lanyard attachments to keep the employee in place allowing the employee to work with both hands.
- 17) **QUALIFIED PERSON** – Trained on the proper installation of the various fall protection systems, and understand the proper use of systems.
- 18) **RETRACTABLE LIFELINE** – This is a self-contained, automatically retracting lifeline that is connecting to an anchorage point capable of supporting 5,000 pounds dead load. It is the standard to use retractable lifelines whenever possible over other approved methods to increase employee fall arrest.

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- 19) **ROPE GRAB** – A rope grab is a device that is attached to a lifeline that is connected to an anchorage point. This device provides the ability to provide independent movement when connected to a full body harness. It is the standard to use rope grabs during the setting-up of Retractable Lifeline Fall Arrest Systems. The use of a rope grab will be used in conjunction with a Shock Absorbing device as issued.
  - 20) **SHOCK ABSORBERS** – This is a component of the fall arrest system, which in the event of a fall will dissipate energy by extending the deceleration distance reducing fall arrest forces. (also called deceleration device).
  - 21) **SNAP HOOKS** – It is the standard to only use locking snaps that are self-closing and have self-locking keepers which remain closed and pressed open for connection which reduces the possibility of accidental disengagement.
  - 22) **TOE BOARD** – A low protective barrier that will prevent the fall of materials and equipment to lower levels and provide protection from falls for personnel.
  - 23) **WARNING LINE SYSTEM** – A barrier erected on a roof to warn employees that they are approaching an unprotected side or edge. This line will designate an area in which work may take place without the use of guardrail, body belt or safety net systems to protect employees in the area. The warning line system must be erected around all sides of the work area.
  - 24) **WORK AREA** – The walking/working surface where job duties are being performed.
- h) **Warnings and Precautions of Fall Protection Devices – Body Wear:**
- 1) Visually check all harnesses to assure proper and secure connections before each use. All straps must be connected and adjusted to provide a snug fit. Check D-Rings for distortion, cracks, breaks and rough or sharp edges, Check harnesses for frayed or broken strands on webbing surfaces.
  - 2) Fall protection connecting devices must be attached to the D-Rings of a full-body harness on the front or back only. Side D-Rings should be used for positioning only.
  - 3) Only locking snap clips, shackles and carabineers are authorized for connection to any D-Ring harness or other device.
  - 4) All harnesses must be maintained to prolong the durable life of the unit and will contribute towards the performance of its vital safety function. Harnesses should be kept clean using a mild solution of water and commercial soap or detergent.
  - 5) Harnesses should be kept dry and should be kept free of contaminates and chemicals and solvents. All harnesses should be properly stored when not in use.
  - 6) Individual harnesses will be tagged stating the manufacture, date of manufacture, model and serial number. Each harness will be issued to the using employee only. No harnesses will be permitted to be shared or loaned to other individuals.
  - 7) Only lifelines and lanyards with locking snaps hooks are permitted.

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- 8) Employee is responsible to visually check that each snap hook freely engages D-Ring or anchor point and that the auxiliary keeper is completely closed.
  - 9) Employee is responsible to tie-off in a manner that limits free fall to the shortest possible distance and not to exceed six (6) feet maximum.
  - 10) When using a shock-absorbing device, consideration must be taken due to unit elongating during a free fall incident.
  - 11) Employee is responsible to tie-off in a manner, which ensures a lower level area will not be struck should a fall occur.
  - 12) Do not tie knots in lifelines or lanyards.
  - 13) Do not tie multiple lanyards together, or wrap lanyards around sharp or rough edges. Use of a cross arm strap is the only approved standard.
  - 14) Only those lifelines, lanyards and other issued components are to be used for life support of an individual.
  - 15) Do not alter or disable a connecting device in any way.
  - 16) Do not use a steel cable for life support unless it is used in conjunction with approved shock absorbing devices.
  - 17) Do not tie off to any anchorage point that is not compatible with lanyard or lifeline snap hooks.
- i) Anchorage Point/Anchorage Connectors:
- 1) The final component of the fall protection system is the anchor or tie-off point. This anchoring point must be capable of supporting a minimum of 5,000 pounds of weight.
  - 2) Prior to performing maintenance and repairs to a roof surface, properly planned anchorage point need to be established and identified by location and function. Anchorage points must be labeled with signage, and are not to be used for any purpose other than an anchorage point for life support of workers. AT NO TIME will an anchorage point be created or developed *without the involvement of a qualified person being part of the design and location*. All anchorage points to be used for fall protection will be documented by building number, location and will be marked on the as-built prints of Engineering Service.
  - 3) It is the standard to utilize the existing I-Beam steel structural member as the primary anchoring point for most pitched roofing work. Additional anchorage points will be by D-Ring and cabling only if the use of the existing I-Beam isn't practical. These additional anchorage points will be established by Engineering/Safety.
  - 4) The use of a nylon cross-arm strap is the only standard of connection between anchoring point and life support lines when using steel I-Beam for the anchorage point.
- j) Emergency Retrieval Policy: To provide a quick and timely response by rescue personnel, to provide aid of an employee in the event of a fall or accident that would require the assistance of others, immediate notification to the Section Supervisor must be established if possible, and if not available or unresponsive to the Engineering Base at the respective campus. Notification to either will start

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a cascading relay and response from the rescue team. Depending on the severity of the incident or injury, the response team will include the Fire Department, and the Accident Investigation Team. Response will be in alignment with the Emergency Management Plan.

- k) The following is Prohibited for Connection:
- 1) Do not use eyebolts and hardware that are unrated and inappropriate steel.
  - 2) Do not tie-off using a rope lifeline or lanyard by knotting the rope to an anchorage point or to make up a length of line used for life support. This will reduce the ropes rated strength by 50 percent or more. Using a stronger lifeline or lanyard to compensate for the weakening effect of the knot is strictly prohibited.
  - 3) Do not tie-off where a line passes over or through rough or sharp surfaces without using chafing gear to protect lifelines or lanyards.
  - 4) Do not connect two (2) or more lifelines or lanyards from the same connecting point or anchoring point. **THIS IS STRICTLY PROHIBITED.**
  - 5) All lifelines and retractable lifelines must be secured to an anchorage or structural member capable of supporting a minimum dead weight of 5,000 pounds. All designated lifeline, safety harnesses and lanyards will be used only for safeguarding an employee and not for material handling and hoisting.

**5. REFERENCES:**

- 29 CFR 1926-Subpart L., M.
- 29 CFR 1910-Subpart D., F.
- V.A. Construction Safety Guidebook, Chapters 4, 9, and 10 dated October 2010 Master Agreement between the Department of Veterans Affairs and the American Federation of Government Employees.

**6. RESCISSION: SOP 138-69HV: Fall Protection Program, issued March 12, 2015.**



**JOHN CLIFFE**  
Chief, Engineering Service

Originator: 138/LJ  
Distribution: Web page

**Department of  
Veterans Affairs  
Memorandum**

**THIS NOTICE MUST BE RECEIVED AT LEAST 72 HOURS PRIOR TO SCHEDULE DATE.**

Date:

From: \_\_\_\_\_ (Contractor)

Subj: Contract # \_\_\_\_\_, Project # \_\_\_\_\_,

To: Contracting Officer (90C) VA HVHCS, Montrose Campus, NY.

1. At our convenience, we are requesting to work:

ON DATE: \_\_\_\_\_

HOURS: From \_\_\_\_\_(am/pm) to \_\_\_\_\_(am/pm)

2. Prime contractor's superintendent MUST be on the job site while the subcontractor(s)and/or prime contractor's employees are working.
3. This modification to the above contract represents full and complete compensation for all Costs, direct and indirect, associated the work and time agreed to herein, including but not limited to all costs incurred for extended overhead, disruption or suspension of work, labor Inefficiencies and impact costs.

\_\_\_\_\_  
**(Signature)**

\_\_\_\_\_  
**(Print/Type Name)**

APPROVED/DISAPPROVED

APPROVED/DISAPPROVED

\_\_\_\_\_  
**(Chief, Projects Section)**

\_\_\_\_\_  
**(Contracting Officer)**

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## SECTION 01 42 19

### REFERENCE STANDARDS

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. This section specifies the availability and source of references and standards specified in the project manual under paragraphs APPLICABLE PUBLICATIONS and/or shown on the drawings.

##### 1.2 AVAILABILITY OF SPECIFICATIONS LISTED IN THE GSA INDEX OF FEDERAL SPECIFICATIONS, STANDARDS AND COMMERCIAL ITEM DESCRIPTIONS FPMR PART 101-29 (FAR 52.211-1) (AUG 1998)

- A. The GSA Index of Federal Specifications, Standards and Commercial Item Descriptions, FPMR Part 101-29 and copies of specifications, standards, and commercial item descriptions cited in the solicitation may be obtained for a fee by submitting a request to – GSA Federal Supply Service, Specifications Section, Suite 8100, 470 East L'Enfant Plaza, SW, Washington, DC 20407, Telephone (202) 619-8925, Facsimile (202) 619-8978.
- B. If the General Services Administration, Department of Agriculture, or Department of Veterans Affairs issued this solicitation, a single copy of specifications, standards, and commercial item descriptions cited in this solicitation may be obtained free of charge by submitting a request to the addressee in paragraph (a) of this provision. Additional copies will be issued for a fee.

##### 1.3 AVAILABILITY FOR EXAMINATION OF SPECIFICATIONS NOT LISTED IN THE GSA INDEX OF FEDERAL SPECIFICATIONS, STANDARDS AND COMMERCIAL ITEM DESCRIPTIONS (FAR 52.211-4) (JUN 1988)

- A. The specifications and standards cited in this solicitation can be examined at the following location:
1. DEPARTMENT OF VETERANS AFFAIRS  
Office of Construction & Facilities Management  
Facilities Quality Service (00CFM1A)  
425 Eye Street N.W, (sixth floor)  
Washington, DC 20001  
Telephone Numbers: (202) 632-5249 or (202) 632-5178  
Between 9:00 AM - 3:00 PM

##### 1.4 AVAILABILITY OF SPECIFICATIONS NOT LISTED IN THE GSA INDEX OF FEDERAL SPECIFICATIONS, STANDARDS AND COMMERCIAL ITEM DESCRIPTIONS (FAR 52.211-3) (JUN 1988)

- A. The specifications cited in this solicitation may be obtained from the associations or organizations listed below.
1. AA Aluminum Association Inc.  
<http://www.aluminum.org>
  2. AABC Associated Air Balance Council  
<http://www.aabchq.com>
  3. AAMA American Architectural Manufacturer's Association  
<http://www.aamanet.org>
  4. AASHTO American Association of State Highway and Transportation Officials  
<http://www.aashto.org>
  5. AATCC American Association of Textile Chemists and Colorists  
<http://www.aatcc.org>

6. ACGIH American Conference of Governmental Industrial Hygienists  
<http://www.acgih.org>
7. ACI American Concrete Institute  
<http://www.aci-int.net>
8. ACPA American Concrete Pipe Association  
<http://www.concrete-pipe.org>
9. ACPPA American Concrete Pressure Pipe Association  
<http://www.acppa.org>
10. ADC Air Diffusion Council  
<http://flexibleduct.org>
11. AGA American Gas Association  
<http://www.aga.org>
12. AGC Associated General Contractors of America  
<http://www.agc.org>
13. AGMA American Gear Manufacturers Association, Inc.  
<http://www.agma.org>
14. AH American Hort  
<https://www.americanhort.org>
15. AHAM Association of Home Appliance Manufacturers  
<http://www.aham.org>
16. AIA American Institute of Architects  
<http://www.aia.org>
17. AISC American Institute of Steel Construction  
<http://www.aisc.org>
18. AISI American Iron and Steel Institute  
<http://www.steel.org>
19. AITC American Institute of Timber Construction  
<https://aitc-glulam.org>
20. AMCA Air Movement and Control Association, Inc.  
<http://www.amca.org>
21. ANSI American National Standards Institute, Inc.  
<http://www.ansi.org>
22. APA The Engineered Wood Association  
<http://www.apawood.org>
23. ARI Air-Conditioning and Refrigeration Institute  
<http://www.ari.org>
24. ARPM Association for Rubber Product Manufacturers  
<https://arpm.com>
25. ASABE American Society of Agricultural and Biological Engineers  
<https://www.asabe.org>
26. ASCE American Society of Civil Engineers  
<http://www.asce.org>
27. ASHRAE American Society of Heating, Refrigerating, and Air-Conditioning Engineers  
<http://www.ashrae.org>
28. ASME American Society of Mechanical Engineers  
<http://www.asme.org>
29. ASSE American Society of Sanitary Engineering International  
<http://www.asse-plumbing.org>
30. ASTM American Society for Testing and Materials International  
<http://www.astm.org>
31. AWI Architectural Woodwork Institute  
<https://www.awinet.org>
32. AWS American Welding Society  
<https://www.aws.org>

Reference Standards

36. AWWA American Water Works Association  
<https://www.awwa.org>
37. BHMA Builders Hardware Manufacturers Association  
<https://www.buildershardware.com>
38. BIA The Brick Industry Association  
<http://www.gobrick.com>
39. CAGI Compressed Air and Gas Institute  
<https://www.cagi.org>
40. CGA Compressed Gas Association, Inc.  
<https://www.cganet.com>
41. CI The Chlorine Institute, Inc.  
<https://www.chlorineinstitute.org>
42. CISCA Ceilings and Interior Systems Construction Association  
<https://www.cisca.org>
43. CISPI Cast Iron Soil Pipe Institute  
<https://www.cispi.org>
44. CLFMI Chain Link Fence Manufacturers Institute  
<https://www.chainlinkinfo.org>
45. CPA Composite Panel Association
46. <https://www.compositepanel.org>
47. CPMB Concrete Plant Manufacturers Bureau  
<https://www.cpmb.org>
48. CRA California Redwood Association  
<http://www.calredwood.org>
49. CRSI Concrete Reinforcing Steel Institute  
<https://www.crsi.org>
50. CTI Cooling Technology Institute  
<https://www.cti.org>
51. DHA Decorative Hardwoods Association
52. <https://www.decorativehardwood.org>
53. DHI Door and Hardware Institute  
<https://www.dhi.org>
54. EGSA Electrical Generating Systems Association  
<http://www.egsa.org>
55. EEI Edison Electric Institute  
<https://www.eei.org>
56. EPA United States Environmental Protection Agency  
<https://www.epa.gov>
57. ETL ETL Testing Services  
<http://www.intertek.com>
58. FAA Federal Aviation Administration  
<https://www.faa.gov>
59. FCC Federal Communications Commission  
<https://www.fcc.gov>
60. FPS Forest Products Society  
<http://www.forestprod.org>
61. GANA Glass Association of North America  
<http://www.glasswebsite.com>
62. FM Factory Mutual Global Insurance  
<https://www.fmglobal.com>
63. GA Gypsum Association  
<https://gypsum.org>
64. GSA General Services Administration  
<https://www.gsa.gov>

65. HI Hydraulic Institute  
<http://www.pumps.org>
66. ICC International Code Council  
<https://shop.iccsafe.org>
67. ICEA Insulated Cable Engineers Association  
<https://www.icea.net>
68. ICAC Institute of Clean Air Companies  
<http://www.icac.com>
69. IEEE Institute of Electrical and Electronics Engineers  
<https://www.ieee.org>
70. IGMA Insulating Glass Manufacturers Alliance
71. <https://www.igmaonline.org>
72. IMSA International Municipal Signal Association  
<http://www.imsasafety.org>
73. MBMA Metal Building Manufacturers Association  
<https://www.mbma.com>
74. MSS Manufacturers Standardization Society of the Valve and Fittings Industry  
<http://msshq.org>
75. NAAMM National Association of Architectural Metal Manufacturers  
<https://www.naamm.org>
76. PHCC Plumbing-Heating-Cooling Contractors Association  
<https://www.phccweb.org>
77. NBS National Bureau of Standards  
See - NIST
78. NBBI The National Board of Boiler and Pressure Vessel Inspectors  
<https://www.nationalboard.org>
79. NEC National Electric Code  
See - NFPA National Fire Protection Association
80. NEMA National Electrical Manufacturers Association  
<https://www.nema.org>
81. NFPA National Fire Protection Association  
<https://www.nfpa.org>
82. NHLA National Hardwood Lumber Association  
<https://www.nhla.com>
83. NIH National Institute of Health  
<https://www.nih.gov>
84. NIST National Institute of Standards and Technology  
<https://www.nist.gov>
85. NELMA Northeastern Lumber Manufacturers Association, Inc.  
<http://www.nelma.org>
86. NPA National Particleboard Association  
(See CPA, Composite Panel Association)
87. NSF National Sanitation Foundation  
<http://www.nsf.org>
88. OSHA Occupational Safety and Health Administration  
Department of Labor  
<https://www.osha.gov>
89. PCA Portland Cement Association  
<https://www.cement.org>
90. PCI Precast Prestressed Concrete Institute  
<https://www.pci.org>
91. PPI Plastics Pipe Institute  
<https://www.plasticpipe.org>
92. PEI Porcelain Enamel Institute  
<http://www.porcelainenamel.com>

Reference Standards

93. PTI Post-Tensioning Institute  
<http://www.post-tensioning.org>
94. RFCI Resilient Floor Covering Institute  
<https://www.rfci.com>
95. RIS Redwood Inspection Service  
(See Western Wood Products Association)  
<https://www.wwpa.org>
96. SCMA Southern Cypress Manufacturers Association  
<http://www.cypressinfo.org>
98. SDI Steel Door Institute  
<http://www.steeldoor.org>
99. SJI Steel Joist Institute  
<https://www.steeljoist.org>
100. SMACNA Sheet Metal & Air-Conditioning Contractors'  
National Association  
<https://www.smacna.org>
101. SSPC The Society for Protective Coatings  
<https://www.sspc.org>
102. STI Steel Tank Institute  
<https://www.steeltank.com>
103. SWI Steel Window Institute  
<https://www.steelwindows.com>
104. TCNA Tile Council of North America  
<https://www.tcnatile.com>
106. TEMA Tubular Exchanger Manufacturers Association  
<http://www.tema.org>
107. TPI Truss Plate Institute  
<https://www.tpinst.org>
108. UBC The Uniform Building Code  
(See ICC)
109. UL Underwriters' Laboratories Incorporated  
<https://www.ul.com>
110. ULC Underwriters' Laboratories of Canada  
<https://www.ulc.ca>
111. WCLB West Coast Lumber Inspection Bureau  
<http://www.wclib.org>
112. WDMA Window and Door Manufacturers Association  
<https://www.wdma.com>
114. WRCLA Western Red Cedar Lumber Association  
<https://www.realcedar.com>
115. WWPA Western Wood Products Association  
<http://www.wwpa.org>

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## SECTION 01 45 00

### QUALITY CONTROL

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. This section specifies requirements for Contractor Quality Control (CQC) for Design-Bid-Build (DBB) construction projects. This section can be used for both project types.

##### 1.2 APPLICABLE PUBLICATIONS

- A. The publication 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.
- B. ASTM International (ASTM)
  - 1. D3740 - (2012a) Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
  - 2. E329 - (2014a) Standard Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction

##### 1.3 SUBMITTALS

- A. Government approval is required for all submittals. CQC inspection reports shall be submitted under this Specification section and follow the Applicable CQC Control Phase (Preparatory, Initial, or Follow-Up): Applicable Specification section naming convention.
  - 1. Preconstruction Submittals
    - a. Interim CQC Plan
    - b. CQC Plan
  - 2. Design Data
    - a. Discipline-Specific Checklists
    - b. Independent Design Reviews:
      - 1) Submit identification of the Independent Technical Reviewer (ITR) team, the ITR review comments, responses, and the record of resolution of the comments.
  - 3. Test Reports
    - a. Verification Statement
  - 4. Third-Party Inspection Reports
    - a. Third-Party Inspection Report shall be submitted to the COR.
    - b. Inspection reports shall include work inspected or tested was or was not completed in conformance to approved construction documents.
      - 1) Discrepancies shall be brought to the immediate attention of the contractor and COR.
    - c. Final Third-Party Inspection Report:
      - 1) Prior to the start of Commissioning activities, the Third-Party Inspection contractor shall submit a final Report documenting inspections and tests, and correction of any discrepancies notes in the inspections or tests.

## **PART 2 - PRODUCTS – NOT USED**

## **PART 3 - EXECUTION**

### **3.1 GENERAL REQUIREMENTS**

- A. Establish and maintain an effective quality control (QC) system that complies with the FAR Clause 52.246.12 titled "Inspection of Construction". QC consists of plans, procedures, and organization necessary to produce an end product which complies with the Contract requirements. The QC system covers all construction operations, both onsite and offsite, and be keyed to the proposed construction sequence. The project superintendent will be held responsible for the quality of work and is subject to removal by the Contracting Office or Authorized designee 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 CQC PLAN:**

- A. Submit the CQC Plan no later than 15 days after receipt of Notice to Proceed (NTP) proposed to implement the requirements of the FAR Clause 52.246.12 titled "Inspection of Construction". The Government will consider an Interim CQC Plan for the first 5, business days of NTP. 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 CQC Plan will not be permitted to begin until acceptance of a CQC Plan or another Interim CQC Plan containing the additional work scope is accepted.
- B. Content of the CQC Plan: Include, as a minimum, the following to cover all construction operations, both onsite and offsite, including work by subcontractors, designers of record consultants, architects/engineers (A/E), fabricators, suppliers, and purchasing agents:
1. A description of the QC organization, including a chart showing lines of authority and acknowledgement 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.
  2. The name, qualifications (in resume format) duties, responsibilities, and authorities of each person assigned a CQC function.
  3. 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 to the Contracting Officer or Authorized designee. be issued by the CQC System Manager. Furnish copies of these letters
  4. Procedures for scheduling, reviewing, certifying, and managing submittals including those of subcontractors, designers of record, consultants, A/E's offsite fabricators, suppliers and purchasing agents. These procedures must be in accordance with Section 01 33 23 Shop Drawings, Product Data, and Samples.
  5. Control, verification, and acceptance of 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 or Authorized designee are required to be used)
  6. Procedures for tracking Preparatory, Initial, and Follow-Up control phases and control, verification, and acceptance tests including documentation.

7. Procedures for tracking construction deficiencies from identification through acceptable corrective action. Establish verification procedures that identified deficiencies have been corrected.
  8. Reporting procedures, including proposed reporting formats.
  9. 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 specifications can generally be considered as a definable feature of work, there are frequently more than one definable feature under a particular section. This list will be agreed upon during the Coordination meeting.
  10. Coordinate schedule work with Special Inspections required by Section 01 45 35 Special Inspections, the Statement of Special Inspections and Schedule of Special Inspections. Where the applicable Code issue by the International Code Council (ICC) calls for inspections by the Building Official, the Contractor must include the inspections in the CQC Plan and must perform the inspections required by the applicable ICC. The Contractor must perform these inspections using independent qualified inspectors. Include the Special Inspection Plan requirements in the CQC Plan.
- C. Acceptance of Plan: Acceptance of the Contractor's plan is required prior to the start of construction. Acceptance is conditional and will be predicated on satisfactory performance during the design and construction. The Government reserves the right to require the Contractor to make changes in the CQC Plan and operations including removal of personnel as necessary, to obtain the quality specified.
- D. Notification of Changes: After acceptance of the CQC Plan, notify the Contracting Officer or Authorized designee in writing of any proposed change. Proposed changes are subject to acceptance by the Government prior to implementation by the Contractor.

### **3.3 COORDINATION MEETING:**

- A. After the Preconstruction Conference Post-award Conference before start of construction, and prior to acceptance by the Government of the CQC Plan, meet with the Contracting Officer or Authorized designee to discuss the Contractor's quality control system. Submit the CQC Plan a minimum of 5 business 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 CC operations, design activities (if applicable), 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 Contracting Officer or Authorized designee 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 or address deficiencies in the CQC system or procedures which can require corrective action by the Contractor.

### **3.4 QUALITY CONTROL ORGANIZATION:**

- A. Personnel Requirements: The requirements for the CQC organization are a Safety and Health Manager, CQC System Manager, and sufficient number of additional qualified personnel to ensure safety and Contract compliance, and Third-Party Inspection. The Safety and Health Manager shall satisfy the requirements of Specification 01 35 26 Safety Requirements and 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 or Authorized designee. 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 drawings 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 Government.

- B. 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 5 years construction experience on construction similar to the scope of this Contract. This CQC System manager is on the site at all times during construction and is employed by the General Contractor. Identify in the plan an alternate to serve in the event of the CDQC System Manager's absence. The requirements for the alternate are the same as the CQC System Manager.
- C. CQC Personnel: In addition to CQC personnel specified elsewhere in the contract, provide as part of the CQC organization specialized personnel to assist in the CQC System Manager for the following areas, as applicable: electrical, mechanical, civil, structural, environmental, architectural, materials technician submittals clerk, Commissioning Agent/LEED specialist, and low voltage systems. These individuals or specified technical companies are employees of the prime or subcontractor ; be responsible to the CQC System Manager; be physically present at the construction site during work on the specialized personnel's areas of responsibility; have the necessary education or experience in accordance with the Experience Matrix listed herein. These individuals have no other duties other than quality control. A single person can cover more than one area provided that the single person is qualified to perform QC activities in each designated and that workload allows.
- D. Third-Party Inspections shall be provided for all Divisions per 01 00 00 Part 1.2. Third-Party Quality control procedures and minimum experience shall be as defined in this Section (01 45 00).
- E. Third-Party Inspection Personnel:
  - 1. In addition to CQC personnel specified elsewhere in the contract, provide Third-Party Inspection Personnel as part of the CQC organization specialized personnel to assist in the CQC System Manager for the following areas, as applicable: electrical, mechanical, civil, structural, environmental, architectural, and low voltage systems.
  - 2. These individuals or specified technical companies are directly employed by the General Contractor and cannot be employed by a supplier or subcontractor on this project; be responsible to the CQC System Manager & COR; be physically present at the construction site to observe, inspect, test, and report the results before work is covered up. These individuals or specified technical companies shall have provide the specialized personnel's areas of responsibility; have the necessary education or experience in accordance with the Experience Matrix listed herein.
  - 3. These individuals or companies have no other duties other than Third-Party Inspection. A single person can cover more than one area provided that the single person is qualified to perform Third-Party Inspection activities in each designated and that workload allows.
  - 4. The individuals or specified technical companies shall be subject to acceptance by the Contracting Officer or Authorized designee.
  - 5. These individuals or specified technical companies are not the same as Special Inspector of Record per Section 01 45 35, SPECIAL INSPECTIONS.
- F. EXPERIENCE MATRIX

Area	Qualifications
Civil	Graduate Civil Engineer or Construction Manager with 2 years experience in the type of work being performed on this project or technician with 5 years related experience.
Mechanical	Graduate Mechanical Engineer with 2 years experience or construction professional with 5 years of experience supervising mechanical features of work in the field with a construction company.
Electrical	Graduate Electrical Engineer with 2 years related experience or construction professional with 5 years of experience supervising electrical features of work in the field with a construction company.
Structural	Graduate Civil Engineer (with Structural Track or Focus), Structural Engineer, or Construction Manager with 2 years experience or construction professional with 5 years experience supervising structural features of work in the field with a construction company.
Architectural	Graduate Architect with 2 years experience or construction professional with 5 years of related experience.
Environmental	Graduate Environmental Engineer with 3 years experience.
Submittals	Submittal Clerk with 1 year experience.
Concrete, Pavement, and Soils	Materials Technician with 2 years experience for the appropriate area.
Testing, Adjusting, and Balancing (TAB)	Specialist must be a member of AABC or an experienced technician of the firm certified by the NEBB.

- G. Additional Requirements: In addition to the above experience and education requirements, the CQC System Manager and Alternate CQC System Manager are required to have completed the Construction Quality Management (CQM) for Construction course. If the CQC System Manager does not have a current specification, obtain the CQM for Contractors course identification 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 or Authorized designee for information on the next scheduled class.
- H. 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 or Authorized designee for acceptance.

**3.5 SUBMITTALS AND DELIVERABLES:**

- A. Submittals have to comply with the requirements in Section 01 33 23 Shop Drawings, Product Data, and Samples. The CQC organization is responsible for certifying that all submittals and deliverables are in compliance with the contract requirements. When Section 01 91 00 General Commissioning Requirements is included in the contract, the submittals required by the section have to be coordinated with the Section 01 33 23 Shop Drawings, Product Data, and Samples to ensure adequate time is allowed for each type of submittal required.
1. Third-Party Inspection individuals or specified technical companies shall review the submittals before the contractor submits to the COR.

**3.6 CONTROL:**

- A. 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:
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, references 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 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, that Statement of Special Inspections and the Schedule of Specials 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 (AHA) 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 – contract defined or industry standard if not contract defined - 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 needs to be notified at least 48 hours or 2 business days 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.
- B. Initial Phase: This phase is accomplished at the beginning of a definable feature of work. Accomplish the following:

1. Check work to ensure that it is in full compliance with contract requirements. Review minutes of the Preparatory meeting.
  2. Verify adequacy of controls to ensure full contract compliance. Verify the required control inspection and testing is in compliance with the contract.
  3. Establish level of workmanship and verify that it meets minimum acceptable workmanship standards. Compare with required sample panels as appropriate.
  4. Resolve all differences.
  5. Check safety to include compliance with an upgrading of the safety plan and activity hazard analysis. Review the activity analysis with each worker.
  6. The Government needs to be notified at least 48 hours or 2 business days in advance of beginning the initial phase for definable features 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.
  7. 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.
  8. 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.
- C. Follow-Up Phase: Perform daily checks to assure control activities, including control testing, are providing continued compliance with contract requirements until the 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
- D. Additional Preparatory and Initial Phases on the same definable features of work if: the quality ongoing 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**

- A. 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 acceptance test when specified. Procure the services of a Department of Veteran Affairs approved testing laboratory or establish an approved testing laboratory at the project site. Perform the following activities and record and provide the following data:
1. Verify that testing procedures comply with contract requirements.
  2. Verify that facilities and testing equipment are available and comply with testing standards.
  3. Check test instrument calibration data against certified standards.
  4. Verify that recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.
  5. 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 unique sequential control number identifying the test. If approved by the Contracting Officer or Authorized designee, 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 or Authorized designee. Failure to submit timely test reports as stated results in nonpayment for related work performed and disapproval of the test facility for this Contract.

- B. Testing Laboratories: All testing laboratories must be validated through the procedures contained in Specification section 01 45 29 Testing Laboratory Services.
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.
  2. Capability Recheck: If the selected laboratory fails the capability check, the Contractor will be assessed a charge equal to value of recheck 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.
- C. 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

- A. 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 FAR 52.211-10 – 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. 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.

#### **52.211-10 -- Commencement, Prosecution, and Completion of Work.**

As prescribed in 11.404(b), insert the following clause in solicitations and contracts when a fixed-price construction contract is contemplated. The clause may be changed to accommodate the issuance of orders under indefinite-delivery contracts for construction.

#### **Commencement, Prosecution, and Completion of Work (Apr 1984)**

The Contractor shall be required to:

- (a) commence work under this contract within 60 calendar days after the date the Contractor receives the notice to proceed,
- (b) prosecute the work diligently, and
- (c) complete the entire work ready for use not later than 730 calendar days.\* The time stated for completion shall include final cleanup of the premises.

(End of Clause)

- B. 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 Acceptance Inspection with the customer can be scheduled. Correct any items noted on the Pre-Final Inspection in a timely manner. These

Quality Control

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 construction completion dates.

- C. Final Acceptance Inspection: The Contractor's QC Inspection personnel, plus the superintendent or other primary management person, and the Contracting Officer's Authorized designee is required to be in attendance at the Final Acceptance Inspection. Additional Government personnel can also be in attendance. The Final Acceptance Inspection will be formally scheduled by the Contracting Officer's or Authorized designee based upon results of the Pre-Final Inspection. Notify the Contracting Officer through the COR office 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 schedule 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 FAR Clause 52.246-12 titled "Inspection of Construction".

### **3.9 DOCUMENTATION**

- A. Quality Control Activities: Maintain current records providing factual evidence that required QC activities and 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:
1. The name and area of responsibility of the Contractor/Subcontractor
  2. Operating plant/equipment with hours worked, idle, or down for repair.
  3. 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.
  4. Test and control activities performed with results and references to specification/drawing requirements. Identify the Control Phase (Preparatory, Initial, and/or Follow-Up). List deficiencies noted, along with corrective action.
  5. Quantity of materials received at the site with statement as to acceptability, storage, and reference to specification/drawing requirements.
  6. Submittals and deliverables reviewed, with Contract reference, by whom, and action taken.
  7. Offsite surveillance activities, including actions taken.
  8. Job safety evaluations stating what was checked, results, and instructions or corrective actions.
  9. Instructions given/received and conflicts in plans and specifications.
- B. 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 with 1 week 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 on 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 CQC System Manager. Include copies of test reports and copies of reports prepared by all subordinate QC personnel within the CQC System Manager Report.

### **3.10 SAMPLE FORMS**

- A. Templates of various quality control reports can be found on the Whole Building Design Guide website at [https://www.wbdg.org/FFC/NAVGRAPH/01\\_45\\_00.00\\_20\\_quality\\_control\\_reports.pdf](https://www.wbdg.org/FFC/NAVGRAPH/01_45_00.00_20_quality_control_reports.pdf)

**3.11 NOTIFICATION OF NONCOMPLIANCE:**

1. The Contracting Officer or Authorized designee will notify the Contractor of any detected noncompliance with the foregoing requirements. The Contractor should 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 ---**





<b>CONTRACTOR QUALITY CONTROL REPORT</b>				DATE	Enter (DD/MMM/YY)
(ATTACH ADDITIONAL SHEETS IF NECESSARY)				REPORT NO	Enter Rpt # Here
PHASE	CONTRACT NO	Enter Cnt# Here	CONTRACT TITLE Enter Title and Location of Construction Contract Here		
<b>PREPARATORY</b>	WAS PREPARATORY PHASE WORK PREFORMED TODAY?				YES <input type="checkbox"/> NO <input type="checkbox"/>
	IF YES, FILL OUT AND ATTACH SUPPLEMENTAL PREPARATORY PHASE CHECKLIST.				
	Schedule Activity No.	Definable Feature of Work			Index #
<b>INITIAL</b>	WAS INITIAL PHASE WORK PREFORMED TODAY?				YES <input type="checkbox"/> NO <input type="checkbox"/>
	IF YES, FILL OUT AND ATTACH SUPPLEMENTAL INITIAL PHASE CHECKLIST.				
	Schedule Activity No.	Definable Feature of Work			Index #
<b>FOLLOW-UP</b>	WORK COMPLIES WITH CONTRACT AS APPROVED DURING INITIAL PHASE?				YES <input type="checkbox"/> NO <input type="checkbox"/>
	WORK COMPLIES WITH SAFETY REQUIREMENTS?				YES <input type="checkbox"/> NO <input type="checkbox"/>
	Schedule Activity No.	Description of Work, Testing Performed & By Whom, Definable Feature of Work, Specification Section, Location and List of Personnel Present			
REWORK ITEMS IDENTIFIED TODAY (NOT CORRECTED BY CLOSE OF BUSINESS)		REWORK ITEMS CORRECTED TODAY (FROM REWORK ITEMS LIST)			
Schedule Activity No.	Description	Schedule Activity No.	Description		
REMARKS (Also Explain Any Follow-Up Phase Checklist Item From Above That Was Answered "NO", Manuf. Rep On-Site, etc.)					
Schedule Activity No.	Description				
On behalf of the contractor, I certify that this report is complete and correct and equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.				AUTHORIZED QC MANAGER AT SITE	DATE
<b>GOVERNMENT QUALITY ASSURANCE REPORT</b>				DATE	
QUALITY ASSURANCE REPRESENTATIVE'S REMARKS AND/OR EXCEPTIONS TO THE REPORT					
Schedule Activity No.	Description				
				GOVERNMENT QUALITY ASSURANCE MANAGER	DATE

# GOVERNMENT QUALITY ASSURANCE (QA) REPORT

(ATTACH ADDITIONAL SHEETS IF NECESSARY)

DATE Enter Date (DD/MMM/YY)

CONTRACT NO  
Enter Cnt# Here

TITLE AND LOCATION  
Enter Title and Location of Construction Contract Here

REPORT NO Enter Report # Here

<b>Status</b>	<b>WORKING?</b>	YES	NO	IF NO, WHY NOT: _____
		<input type="checkbox"/>	<input type="checkbox"/>	_____
WEATHER CONDITIONS: _____				

<b>Check Points</b>		YES	NO	REMARKS:
	SUPERINTENDENT ON SITE	<input type="checkbox"/>	<input type="checkbox"/>	
	QC MANAGER ON SITE	<input type="checkbox"/>	<input type="checkbox"/>	
	QC REPORTS CURRENT	<input type="checkbox"/>	<input type="checkbox"/>	
	AS-BUILTS CURRENT	<input type="checkbox"/>	<input type="checkbox"/>	
	SUBMITTALS APPROVED FOR FOR ONGOING WORK	<input type="checkbox"/>	<input type="checkbox"/>	
	DEFICIENCY LIST REVIEWED	<input type="checkbox"/>	<input type="checkbox"/>	

WORK OBSERVED/DEFICIENCIES NOTED/SAFETY ISSUES DISCUSSED/QA TESTS AND RESULTS:

Schedule Activity No	DESCRIBE OBSERVATIONS

MEETING/CONFERENCE NOTES (INCLUDING PARTICIPANTS):

Schedule Activity No.	NOTES

INSTRUCTIONS GIVEN OR RECEIVED/CONTROVERSIES PENDING:

Schedule Activity No.	INSTRUCTIONS/CONTROVERSIES

_____ QA REPRESENTATIVE	_____ DATE	_____ SUPV INITIALS	_____ DATE
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# INITIAL PHASE CHECKLIST

<b>INITIAL PHASE CHECKLIST</b>		SPEC SECTION Enter Spec Section # Here	DATE Enter Date (DD/MMM/YY)
CONTRACT NO Enter Cnt# Here	DEFINABLE FEATURE OF WORK Enter DFOW Here	SCHEDULE ACT NO. Enter Sched Act ID Here	INDEX # Enter Index# Here
<b>PERSONNEL PRESENT</b>	GOVERNMENT REP NOTIFIED _____ HOURS IN ADVANCE:      YES <input type="checkbox"/> NO <input type="checkbox"/>		
	NAME	POSITION	COMPANY/GOVERNMENT
<b>PROCEDURE COMPLIANCE</b>	IDENTIFY FULL COMPLIANCE WITH PROCEDURES IDENTIFIED AT PREPARATORY. COORDINATE PLANS, SPECIFICATIONS, AND SUBMITTALS. COMMENTS: _____		
<b>PRELIMINARY WORK</b>	ENSURE PRELIMINARY WORK IS COMPLETE AND CORRECT. IF NOT, WHAT ACTION IS TAKEN? _____ _____ _____		
<b>WORKMANSHIP</b>	ESTABLISH LEVEL OF WORKMANSHIP. WHERE IS WORK LOCATED? _____		
<b>RESOLUTION</b>	RESOLVE ANY DIFFERENCES. COMMENTS: _____		
<b>CHECK SAFETY</b>	REVIEW JOB CONDITIONS USING EM 385-1-1 AND JOB HAZARD ANALYSIS COMMENTS: _____		
<b>OTHER</b>	OTHER ITEMS OR REMARKS _____ _____		

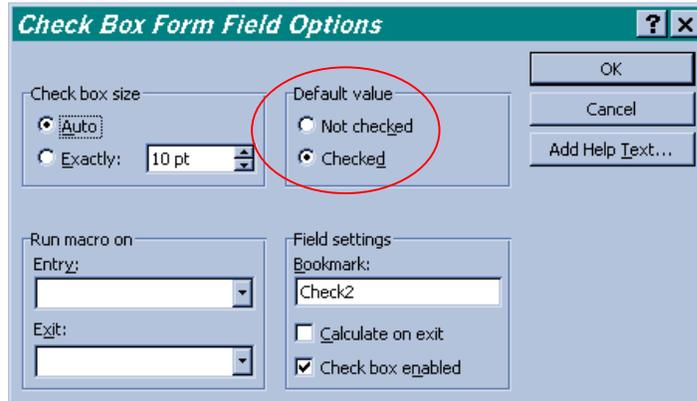
QC MANAGER

DATE

## Instructions for Using Report Forms in MS-Word

In the Report Header, fields that have instructional text such as “Enter Title and Location of Construction Contract Here” prompt the user to enter the information in a specific location, governed by the field. Single mouse click anywhere in the field and the field will darken. Entry of text/data at this point will delete the instructional text in the field and will be replaced with entered text/data.

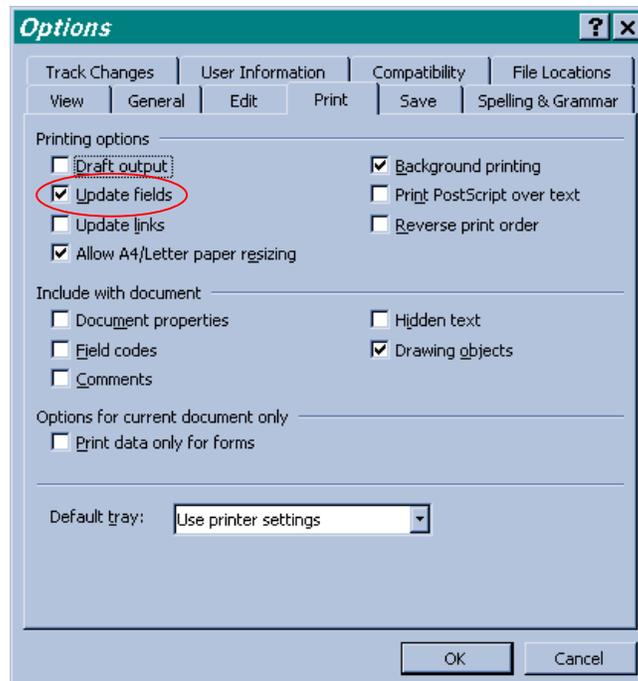
All check boxes are all defaulted as unchecked (i.e.; ). To check the box (i.e.; ) , double click the box and the “Check Box Form Field Options” box will appear. In the “Default value” section of the box, click in the Radio Button for “Checked”, then click on the “OK” button and the box will be checked.



The “Hour” fields were intentionally not programmed to total. If the Contractor deleted the formula in a field within the range that was to be totaled, the total would be wrong.

With the ability to [unlimitedly] expand the Contractor Production Report and Contractor Quality Control Representative Report, their Continuation Sheets are obsolete.

In the footer of each form are data fields for the Sheet number and the total number of sheets in the report (Sheet 1 of 2). The first number will generate itself when pages of the report are added. But MS-Word will not automatically update the second number. To update the NumPages field, click the field or the field results and then press F9. You can also click **Options** in the **Tools** menu, click the **Print** tab, and then select the **Update fields** check box.



# PREPARATORY PHASE CHECKLIST

(CONTINUED ON SECOND PAGE)

		SPEC SECTION	DATE
		Enter Spec Section # Here	Enter Date (DD/MMM/YY)
CONTRACT NO	DEFINABLE FEATURE OF WORK	SCHEDULE ACT NO.	INDEX #
Enter Cnt# Here	Enter DFW Here	Enter Sched Act ID Here	Enter Index# Here
<b>PERSONNEL PRESENT</b>	GOVERNMENT REP NOTIFIED _____ HOURS IN ADVANCE:		YES <input type="checkbox"/> NO <input type="checkbox"/>
	NAME	POSITION	COMPANY/GOVERNMENT
<b>SUBMITTALS</b>	REVIEW SUBMITTALS AND/OR SUBMITTAL REGISTER. HAVE ALL SUBMITTALS BEEN APPROVED? YES <input type="checkbox"/> NO <input type="checkbox"/>		
	IF NO, WHAT ITEMS HAVE NOT BEEN SUBMITTED? _____		
	ARE ALL MATERIALS ON HAND? YES <input type="checkbox"/> NO <input type="checkbox"/>		
	IF NO, WHAT ITEMS ARE MISSING? _____		
<b>MATERIAL STORAGE</b>	ARE MATERIALS STORED PROPERLY? YES <input type="checkbox"/> NO <input type="checkbox"/>		
	IF NO, WHAT ACTION IS TAKEN? _____		
<b>SPECIFICATIONS</b>	REVIEW EACH PARAGRAPH OF SPECIFICATIONS. _____		
	DISCUSS PROCEDURE FOR ACCOMPLISHING THE WORK. _____		
	CLARIFY ANY DIFFERENCES. _____		
<b>PRELIMINARY WORK &amp; PERMITS</b>	ENSURE PRELIMINARY WORK IS CORRECT AND PERMITS ARE ON FILE.		
	IF NOT, WHAT ACTION IS TAKEN? _____		



## RESPONSIBILITIES/AUTHORITY OF THE QC MANAGER

1. Appointing letter to the QC manager shall detail his/her authority and responsibility to act for the contractor and outline his/her duties, responsibilities and authority. He/she shall have no job-related responsibilities other than QC unless specifically permitted in the specification.
2. He/she shall be on the site at all times during progress of the work, with complete authority to take any action necessary to ensure conformance with the contract requirements. In the event of his/her absence, approved backup shall be on the site.
3. Authority to immediately stop any segment of work which does not comply with the contract plans and specifications and direct the removal and replacement of any defective work.
4. Conduct daily inspection of work performed for compliance with plans and specifications.
5. Certify daily that all materials and equipment delivered/installed in the work comply with contract plans and specifications. Certify daily that all work performed on the construction site and off the construction site conforms to plans and specifications. Report any deficiencies and remedial action planned and taken.
6. Supervise and coordinate the inspection and tests made by the members of the Quality Control Organization, including subcontractors.
7. Assure QC staff is adequate to meet its responsibilities.
8. Maintain a copy of the ROICC approved QC Plan on file at the jobsite complete with up-to-date approved revisions/filled-in log of submittals. Maintain at the jobsite an up-to-date QC Submittal Register (provided in the specification) showing the status of all submittals required by the contract.
9. Maintain at the jobsite a testing plan showing status of all tests required by the contracts. Ensure that all tests required are performed and report the results of same. Indicate whether test results show the item tested conforms to contract requirements or not.
10. Authority to remove any individual from the site who fails to perform his/her work in a skillful and workmanlike manner or his/her work does not comply with the contract plans and specifications.
11. QC manager does not have authority to deviate from plans and specifications without prior approval, in writing, from the ROICC.
12. Ensure that the contractor's Quality Control Organization is adequately staffed with qualified personnel to perform all the detailed inspections and testing specified in the plans and specifications.
13. Maintain at the jobsite the up-to-date QC Rework Items List.





**SECTION 01 45 29**

**TESTING LABORATORY SERVICES**

**PART 1 - GENERAL**

**1.1 DESCRIPTION:**

- A. This section specifies materials testing activities and inspection services required during project construction to be provided by a Testing Laboratory retained by the General Contractor.

**1.2 APPLICABLE PUBLICATIONS:**

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.
- B. American Association of State Highway and Transportation Officials (AASHTO):
  - T27-11 ..... Standard Method of Test for Sieve Analysis of Fine and Coarse Aggregates
  - T96-02 (R2006) ..... Standard Method of Test for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
  - T99-10 ..... Standard Method of Test for Moisture-Density Relations of Soils Using a 2.5 Kg (5.5 lb.) Rammer and a 305 mm (12 in.) Drop
  - T104-99 (R2007) ..... Standard Method of Test for Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate
  - T180-10 ..... Standard Method of Test for Moisture-Density Relations of Soils using a 4.54 kg (10 lb.) Rammer and a 457 mm (18 in.) Drop
  - T191-02(R2006) ..... Standard Method of Test for Density of Soil In-Place by the Sand-Cone Method
  - T310-13 ..... Standard Method of Test for In-place Density and Moisture Content of Soil and Soil-aggregate by Nuclear Methods (Shallow Depth)
- C. American Concrete Institute (ACI):
  - 506.4R-94 (R2004) ..... Guide for the Evaluation of Shotcrete
- D. American Society for Testing and Materials (ASTM):
  - A370-12 ..... Standard Test Methods and Definitions for Mechanical Testing of Steel Products
  - A416/A416M-10 ..... Standard Specification for Steel Strand, Uncoated Seven-Wire for Prestressed Concrete
  - C31/C31M-10 ..... Standard Practice for Making and Curing Concrete Test Specimens in the Field
  - C33/C33M-11a ..... Standard Specification for Concrete Aggregates
  - C39/C39M-12 ..... Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
  - C109/C109M-11b ..... Standard Test Method for Compressive Strength of Hydraulic Cement Mortars
  - C136-06 ..... Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates

- C138/C138M-10b..... Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete
- C140-12..... Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units
- C143/C143M-10a..... Standard Test Method for Slump of Hydraulic Cement Concrete
- C172/C172M-10..... Standard Practice for Sampling Freshly Mixed Concrete
- C173/C173M-10b..... Standard Test Method for Air Content of freshly Mixed Concrete by the Volumetric Method
- C330/C330M-09..... Standard Specification for Lightweight Aggregates for Structural Concrete
- C567/C567M-11..... Standard Test Method for Density Structural Lightweight Concrete
- C780-11..... Standard Test Method for Pre-construction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry
- C1019-11..... Standard Test Method for Sampling and Testing Grout
- C1064/C1064M-11..... Standard Test Method for Temperature of Freshly Mixed Portland Cement Concrete
- C1077-11c..... Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation
- C1314-11a..... Standard Test Method for Compressive Strength of Masonry Prisms
- D422-63(2007)..... Standard Test Method for Particle-Size Analysis of Soils
- D698-07e1..... Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort
- D1140-00(2006)..... Standard Test Methods for Amount of Material in Soils Finer than No. 200 Sieve
- D1143/D1143M-07e1..... Standard Test Methods for Deep Foundations Under Static Axial Compressive Load
- D1188-07e1..... Standard Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Coated Samples
- D1556-07..... Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
- D1557-09..... Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000ft lbf/ft<sup>3</sup> (2,700 KNm/m<sup>3</sup>))
- D2166-06..... Standard Test Method for Unconfined Compressive Strength of Cohesive Soil
- D2167-08)..... Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method
- D2216-10..... Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
- D2974-07a..... Standard Test Methods for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils

Testing Laboratory Services

- D3666-11..... Standard Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials
- D3740-11..... Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as used in Engineering Design and Construction
- D6938-10..... Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
- E94-04(2010) ..... Standard Guide for Radiographic Examination
- E164-08..... Standard Practice for Contact Ultrasonic Testing of Weldments
- E329-11c..... Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection
- E543-09..... Standard Specification for Agencies Performing Non-Destructive Testing
- E605-93(R2011)..... Standard Test Methods for Thickness and Density of Sprayed Fire Resistive Material (SFRM) Applied to Structural Members
- E709-08..... Standard Guide for Magnetic Particle Examination
- E1155-96(R2008)..... Determining FF Floor Flatness and FL Floor Levelness Numbers
- F3125/F3125M-15..... Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi (830 MPa) and 150 ksi (1040 MPa) Minimum Tensile Strength, Inch and Metric Dimensions

- E. American Welding Society (AWS):
  - D1.D1.1M-10 ..... Structural Welding Code-Steel

**1.3 REQUIREMENTS:**

- A. Accreditation Requirements: Construction materials testing laboratories must be accredited by a laboratory accreditation authority and will be required to submit a copy of the Certificate of Accreditation and Scope of Accreditation. The laboratory’s scope of accreditation must include the appropriate ASTM standards (i.e.; E329, C1077, D3666, D3740, A880, E543) listed in the technical sections of the specifications. Laboratories engaged in Hazardous Materials Testing shall meet the requirements of OSHA and EPA. The policy applies to the specific laboratory performing the actual testing, not just the “Corporate Office.”
- B. Inspection and Testing: Testing laboratory shall inspect materials and workmanship and perform tests described herein and additional tests requested by COR. When it appears materials furnished, or work performed by Contractor fail to meet construction contract requirements, Testing Laboratory shall direct attention of COR to such failure.
- C. Written Reports: Testing laboratory shall submit test reports to COR, Contractor, unless other arrangements are agreed to in writing by the COR. Submit reports of tests that fail to meet construction contract requirements on colored paper.
- D. Verbal Reports: Give verbal notification to COR immediately of any irregularity.

## PART 2 - PRODUCTS (NOT USED)

## PART 3 - EXECUTION

### 3.1 EARTHWORK:

- A. General: The Testing Laboratory shall provide qualified personnel, materials, equipment, and transportation as required to perform the services identified/required herein, within the agreed to schedule and/or time frame. The work to be performed shall be as identified herein and shall include but not be limited to the following:
1. Observe fill and subgrades during proof-rolling to evaluate suitability of surface material to receive fill or base course. Provide recommendations to the COR regarding suitability or unsuitability of areas where proof-rolling was observed. Where unsuitable results are observed, witness excavation of unsuitable material and recommend to COR extent of removal and replacement of unsuitable materials and observe proof-rolling of replaced areas until satisfactory results are obtained.
  2. Provide full time observation of fill placement and compaction and field density testing in building areas and provide full time observation of fill placement and compaction and field density testing in pavement areas to verify that earthwork compaction obtained is in accordance with contract documents.
  3. Provide supervised geotechnical technician to inspect excavation, subsurface preparation, and backfill for structural fill.
- B. Testing Compaction:
1. Determine maximum density and optimum moisture content for each type of fill, backfill and subgrade material used, in compliance with ASTM D698 D1557 Method A ASTM D698 and/or ASTM D1557.
  2. Make field density tests in accordance with the primary testing method following ASTM D6938 wherever possible. Field density tests utilizing ASTM D1556 , or ASTM D2167 shall be utilized on a case by case basis only if there are problems with the validity of the results from the primary method due to specific site field conditions. Should the testing laboratory propose these alternative methods, they should provide satisfactory explanation to the COR before the tests are conducted.
    - a. Building Slab Subgrade: At least one test of subgrade for every 185 m<sup>2</sup> (2000 square feet) of building slab, but in no case fewer than three tests. In each compacted fill layer, perform one test for every 185 m<sup>2</sup> (2000 square feet) of overlaying building slab, but in no case fewer than three tests.
    - b. Foundation Wall Backfill: One test per 30 m (100 feet) of each layer of compacted fill but in no case fewer than two tests.
    - c. Pavement Subgrade: One test for each 335 m<sup>2</sup> (400 square yards), but in no case fewer than two tests.
    - d. Curb, Gutter, and Sidewalk: One test for each 90 m (300 feet), but in no case fewer than two tests.
    - e. Trenches: One test at maximum 30 m (100 foot) intervals per 1200 mm (4 foot) of vertical lift and at changes in required density, but in no case fewer than two tests.
    - f. Footing Subgrade: At least one test for each layer of soil on which footings will be placed. Subsequent verification and approval of each footing subgrade may be based on a visual comparison of each subgrade with related tested subgrade when acceptable to COR. In each compacted fill layer below wall footings, perform one field density test for every 30 m (100 feet) of wall. Verify subgrade is level, all loose or disturbed soils have been removed, and correlate actual soil conditions observed with those indicated by test borings.
- C. Fill and Backfill Material Gradation: One test per cubic] yards stockpiled or in-place source material. Gradation of fill and backfill material shall be determined in accordance with ASTM C136 ASTM D422 ASTM D1140.

- D. Testing for Footing Bearing Capacity: Evaluate if suitable bearing capacity material is encountered in footing subgrade.
- E. Testing Materials: Test suitability of on-site and off-site borrow as directed by COR.

**3.2 FOUNDATION PILES:**

- A. Witness load test procedure for conformance with ASTM D1143 and interpret test data to verify geotechnical recommendations for pile capacity. Submit load test report in accordance with ASTM D1143.
- B. Review Contractor's equipment, methods, and procedures prior to starting any work on site. Provide continuous inspection of pile installation. Maintain a record of all pertinent phases of operation for submittal to COR.
- C. Auger-Placed Piles: Take and test samples of grout in accordance with ASTM C109 for conformance with specified strength requirements. Not less than six cubes shall be made for each day of casting. Test three cubes at 7 days and three at 28 days.
- D. Cast-in-Place Concrete Piles: Test concrete including materials for concrete as required in Article CONCRETE of this section, except make two test cylinders for each day's production of each strength of concrete produced.
- E. Prestressed Concrete Piles:
  - 1. Inspection at Plant: Inspect forms, placement of reinforcing steel and strands, placement and finishing of concrete, and tensioning of strands.
  - 2. Concrete Testing: Test concrete including materials for concrete as required in Article, CONCRETE of this section, except make two test cylinders for each day's production of each strength of concrete produced.
  - 3. Test strand for conformance with ASTM A416/A416M and furnish report to COR.
  - 4. Inspect piles to insure specification requirements for curing and finishes have been met.

**3.3 FOUNDATION CAISSONS:**

- A. Concrete Testing: Test concrete including materials for concrete as required in Article, CONCRETE of this section, except make two test cylinders for each day's placement of concrete.
- B. Maintain a record of concrete used in each caisson. Compare records with calculated volumes.
- C. Inspect percussion hole in bottom of each caisson to determine that material is capable of supporting design load.
- D. Inspect sides and bottom of each caisson for compliance with contract documents.
- E. Submit a certified "Caisson Field Record" for each caisson, recording actual elevation at bottom of shaft; final center line location of top; variation of shaft from plumb; results of all tests performed; actual allowable bearing capacity of bottom; depth of socket into rock; levelness of bottom; seepage of water; still water level (if allowed to flood); variation of shaft (from dimensions shown); location and size of reinforcement, and evidence of seams, voids, or channels below the bottom. Verify the actual bearing capacity of the rock strata by the use of a calibrated penetrometer or other acceptable method.
- F. Caissons Bearing on Hardpan: Take undisturbed samples, suitable for tests required, from caisson bottom. Make auger probe to a depth of 2.5 meters (8 feet) below bottom and visually inspect and classify soil. Verify continuity of strata and thickness.
  - 1. Conduct the following test on each sample, and report results and evaluations to the COR:
    - a. Unconfined Compression Test (ASTM D2166).
    - b. Moisture Content (ASTM D2216).
    - c. Density.

**3.4 LANDSCAPING:**

- A. Test topsoil for organic materials, pH, phosphate, potash content, and gradation of particles.
  - 1. Test for organic material by using ASTM D2974.
  - 2. Determine percent of silt, sand, clay, and foreign materials such as rock, roots, and vegetation.
- B. Submit laboratory test report of topsoil to COR.

**3.5 ASPHALT CONCRETE PAVING:**

- A. Aggregate Base Course:
  - 1. Determine maximum density and optimum moisture content for aggregate base material in accordance with ASTM D1557, Method D.
  - 2. Make a minimum of three field density tests on each day's final compaction on each aggregate course in accordance with ASTM D1556.
  - 3. Sample and test aggregate as necessary to insure compliance with specification requirements for gradation, wear, and soundness as specified in the applicable state highway standards and specifications.
- B. Asphalt Concrete:
  - 1. Aggregate: Sample and test aggregates in stock pile and hot-bins as necessary to insure compliance with specification requirements for gradation (AASHTO T27), wear (AASHTO T96), and soundness (AASHTO T104).
  - 2. Temperature: Check temperature of each load of asphalt concrete at mixing plant and at site of paving operation.
  - 3. Density: Make a minimum of two field density tests in accordance with ASTM D1188 of asphalt base and surface course for each day's paving operation.

**3.6 SITE WORK CONCRETE:**

- A. Test site work concrete including materials for concrete as required in Article CONCRETE of this section.

**3.7 POST-TENSIONING OF CONCRETE:**

- A. Inspection Prior to Concreting: Inspect tendons, drape of tendons, and anchorage components for compliance prior to concreting.
- B. Concrete Testing: As required in Article, CONCRETE of this section except make three test cylinders representing each area to be tensioned and cylinders shall be cured in same manner as concrete they represent. Make compression test prior to determining minimum specified strength required for post-tensioning.
- C. Post-tensioning: Witness post-tensioning operation and record actual gauge pressures and elongations applied to each tendon.
- D. Submit reports in quadruplicate of the following:
  - 1. Inspection of placement and post-tensioning of all tendons.
  - 2. Size, number, location, and drape of tendons.
  - 3. Calculated elongations, based upon the length, modulus of elasticity, and cross-sectional area of the tendons used.
  - 4. Actual field elongations. Check elongation of tendons within ranges established by manufacturer.
  - 5. Calculated gauge pressure and jacking force applied to each tendon.
  - 6. Actual gauge pressures and jacking force applied to each tendon.
  - 7. Required concrete strength at time of jacking.
  - 8. Actual concrete strength at time of jacking.
  - 9. Do not cut or cover the tendon ends until the Contractor receives the COR's written approval of the post-tensioning records.

**3.8 CONCRETE:**

- A. Batch Plant Inspection and Materials Testing:
1. Perform continuous batch plant inspection until concrete quality is established to satisfaction of COR with concurrence of Contracting Officer and perform periodic inspections thereafter as determined by COR.
  2. Periodically inspect and test batch proportioning equipment for accuracy and report deficiencies to COR.
  3. Sample and test mix ingredients as necessary to insure compliance with specifications.
  4. Sample and test aggregates daily and as necessary for moisture content. Test the dry rodded weight of the coarse aggregate whenever a sieve analysis is made, and when it appears there has been a change in the aggregate.
  5. Certify, in duplicate, ingredients and proportions and amounts of ingredients in concrete conform to approved trial mixes. When concrete is batched or mixed off immediate building site, certify (by signing, initialing or stamping thereon) on delivery slips (duplicate) that ingredients in truck-load mixes conform to proportions of aggregate weight, cement factor, and water-cement ratio of approved trial mixes.
- B. Field Inspection and Materials Testing:
1. Provide a technician at site of placement at all times to perform concrete sampling and testing.
  2. Review the delivery tickets of the ready-mix concrete trucks arriving on-site. Notify the Contractor if the concrete cannot be placed within the specified time limits or if the type of concrete delivered is incorrect. Reject any loads that do not comply with the Specification requirements. Rejected loads are to be removed from the site at the Contractor's expense. Any rejected concrete that is placed will be subject to removal.
  3. Take concrete samples at point of placement in accordance with ASTM C172. Mold and cure compression test cylinders in accordance with ASTM C31. Make at least three cylinders for each 40 m<sup>3</sup> (50 cubic yards) or less of each concrete type, and at least three cylinders for any one day's pour for each concrete type. After good concrete quality control has been established and maintained as determined by COR make three cylinders for each 80 m<sup>3</sup> (100 cubic yards) or less of each concrete type, and at least three cylinders from any one day's pour for each concrete type. Label each cylinder with an identification number. COR may require additional cylinders to be molded and cured under job conditions.
  4. Perform slump tests in accordance with ASTM C143. Test the first truck each day, and every time test cylinders are made. Test pumped concrete at the hopper and at the discharge end of the hose at the beginning of each day's pumping operations to determine change in slump.
  5. Determine the air content of concrete per ASTM C173. For concrete required to be air-entrained, test the first truck and every 20 m<sup>3</sup> (25 cubic yards) thereafter each day. For concrete not required to be air-entrained, test every 80 m<sup>3</sup> (100 cubic yards) at random. For pumped concrete, initially test concrete at both the hopper and the discharge end of the hose to determine change in air content.
  6. If slump or air content fall outside specified limits, make another test immediately from another portion of same batch.
  7. Perform unit weight tests in compliance with ASTM C138 for normal weight concrete and ASTM C567 for lightweight concrete. Test the first truck and each time cylinders are made.
  8. Notify laboratory technician at batch plant of mix irregularities and request materials and proportioning check.
  9. Verify that specified mixing has been accomplished.
  10. Environmental Conditions: Determine the temperature per ASTM C1064 for each truckload of concrete during hot weather and cold weather concreting operations:
    - a. When ambient air temperature falls below 4.4 degrees C (40 degrees F), record maximum and minimum air temperatures in each 24 hour period; record air

- temperature inside protective enclosure; record minimum temperature of surface of hardened concrete.
- b. When ambient air temperature rises above 29.4 degrees C (85 degrees F), record maximum and minimum air temperature in each 24 hour period; record minimum relative humidity; record maximum wind velocity; record maximum temperature of surface of hardened concrete.
11. Inspect the reinforcing steel placement, including bar size, bar spacing, top and bottom concrete cover, proper tie into the chairs, and grade of steel prior to concrete placement. Submit detailed report of observations.
  12. Observe conveying, placement, and consolidation of concrete for conformance to specifications.
  13. Observe condition of formed surfaces upon removal of formwork prior to repair of surface defects and observe repair of surface defects.
  14. Observe curing procedures for conformance with specifications, record dates of concrete placement, start of preliminary curing, start of final curing, end of curing period.
  15. Observe preparations for placement of concrete:
    - a. Inspect handling, conveying, and placing equipment, inspect vibrating and compaction equipment.
    - b. Inspect preparation of construction, expansion, and isolation joints.
  16. Observe preparations for protection from hot weather, cold weather, sun, and rain, and preparations for curing.
  17. Observe concrete mixing:
    - a. Monitor and record amount of water added at project site.
    - b. Observe minimum and maximum mixing times.
  18. 18. Measure concrete flatwork for levelness and flatness as follows:
    - a. Perform Floor Tolerance Measurements  $F_F$  and  $F_L$  in accordance with ASTM E1155. Calculate the actual overall F- numbers using the inferior/superior area method.
    - b. Perform all floor tolerance measurements within 48 hours after slab installation and prior to removal of shoring and formwork.
    - c. Provide the Contractor and the COR with the results of all profile tests, including a running tabulation of the overall  $F_F$  and  $F_L$  values for all slabs installed to date, within 72 hours after each slab installation.
  19. Other inspections:
    - a. Grouting under base plates.
    - b. Grouting anchor bolts and reinforcing steel in hardened concrete.
- C. Laboratory Tests of Field Samples:
1. Test compression test cylinders for strength in accordance with ASTM C39. For each test series, test one cylinder at 7 days and one cylinder at 28 days. Use remaining cylinder as a spare tested as directed by COR. Compile laboratory test reports as follows: Compressive strength test shall be result of one cylinder, except when one cylinder shows evidence of improper sampling, molding or testing, in which case it shall be discarded and strength of spare cylinder shall be used.
  2. Make weight tests of hardened lightweight structural concrete in accordance with ASTM C567.
  3. Furnish certified compression test reports (duplicate) to COR. In test report, indicate the following information:
    - a. Cylinder identification number and date cast.
    - b. Specific location at which test samples were taken.
    - c. Type of concrete, slump, and percent air.
    - d. Compressive strength of concrete in MPa (psi).
    - e. Weight of lightweight structural concrete in  $\text{kg/m}^3$  (pounds per cubic feet).
    - f. Weather conditions during placing.
    - g. Temperature of concrete in each test cylinder when test cylinder was molded.

- h. Maximum and minimum ambient temperature during placing.
- i. Ambient temperature when concrete sample in test cylinder was taken.
- j. Date delivered to laboratory and date tested.

**3.9 REINFORCEMENT:**

- A. Review mill test reports furnished by Contractor.
- B.
- C. Make one tensile and one bend test in accordance with ASTM A370 from each pair of samples obtained.
- D. Written report shall include, in addition to test results, heat number, manufacturer, type and grade of steel, and bar size.
- E. Perform tension tests of mechanical and welded splices in accordance with ASTM A370.

**3.10 SHOTCRETE:**

- A. Inspection and Material Testing:
  - 1. Provide field inspection and testing service as required by COR to certify that shotcrete has been applied in accordance with contract documents.
  - 2. Periodically inspect and test proportioning equipment for accuracy and report deficiencies to COR.
  - 3. Sample and test mix ingredients as necessary to insure compliance with specifications.
  - 4. Sample and test aggregates daily and as necessary for moisture content. Report instances of excessive moisture to COR.
  - 5. Certify, in duplicate, that ingredients and proportions and amounts of ingredients in shotcrete conform to approved trial mixes.
  - 6. Provide field inspection of the proper size and placement of the reinforcement in the shotcrete.
- B. Shotcrete Sampling:
  - 1. Provide a technician at site of placement to perform shotcrete sampling.
  - 2. Take cores in accordance with ACI 506.
  - 3. Insure maintenance of water-cement ratio established by approved trial mix.
  - 4. Verify specified mixing has been accomplished.
- C. Laboratory Tests of Field Sample Panels:
  - 1. Compression test core for strength in accordance with ACI 506. For each test series of three cores, test one core at 7 days and one core at 28 days. Use remaining core as a spare to be tested at either 7 or 28 days as required. Compile laboratory test reports as follows: Compressive strength test shall be result of one core, except when one core shows evidence of improper sampling or testing, in which case it shall be discarded and strength of spare core shall be used.
  - 2. Submit certified compression test reports (duplicate) to COR. On test report, indicate following information:
    - a. Core identification number and date cast.
    - b. Specific location at which test samples were taken.
    - c. Compressive strength of shotcrete in MPa (psi).
    - d. Weather conditions during placing.
    - e. Temperature of shotcrete in each test core when test core was taken.
    - f. Maximum and minimum ambient temperature during placing.
    - g. Ambient temperature when shotcrete sample was taken.
    - h. Date delivered to laboratory and date tested.
- D. Submit inspection reports certification and instances of noncompliance to COR.

**3.11 PRESTRESSED CONCRETE:**

- A. Inspection at Plant: Forms, placement and concrete cover of reinforcing steel and tendons, placement and finishing of concrete, and tensioning of tendons.
- B. Concrete Testing: Test concrete including materials for concrete required in Article, CONCRETE of this section, except make two test cylinders for each day's production of each strength of concrete produced.
- C. Test tendons for conformance with ASTM A416 and furnish report to COR.
- D. Inspect members to insure that specification requirements for curing and finishes have been met.

**3.12 ARCHITECTURAL PRECAST CONCRETE:**

- A. Inspection at Plant: Forms, placement of reinforcing steel, concrete cover, and placement and finishing of concrete.
- B. Concrete Testing: Test concrete including materials for concrete as required in Article CONCRETE of this section, except make two test cylinders for each day's production of each strength of concrete produced.
- C. Inspect members to insure specification requirements for curing and finishes have been met.

**3.13 MASONRY:**

- A. Mortar Tests:
  - 1. Laboratory compressive strength test:
    - a. Comply with ASTM C780.
    - b. Obtain samples during or immediately after discharge from batch mixer.
    - c. Furnish molds with 50 mm (2 inch), 3 compartment gang cube.
    - d. Test one sample at 7 days and 2 samples at 28 days.
  - 2. Two tests during first week of operation; one test per week after initial test until masonry completion.
- B. Grout Tests:
  - 1. Laboratory compressive strength test:
    - a. Comply with ASTM C1019.
    - b. Test one sample at 7 days and 2 samples at 28 days.
    - c. Perform test for each 230 m<sup>2</sup> (2500 square feet) of masonry.
- C. Masonry Unit Tests:
  - 1. Laboratory Compressive Strength Test:
    - a. Comply with ASTM C140.
    - b. Test 3 samples for each 460 m<sup>2</sup> (5000 square feet) of wall area.
- D. Prism Tests: For each type of wall construction indicated, test masonry prisms per ASTM C1314 for each 460 m<sup>2</sup> (5000 square feet) of wall area. Prepare one set of prisms for testing at 7 days and one set for testing at 28 days.

**3.14 STRUCTURAL STEEL:**

- A. General: Provide shop and field inspection and testing services to certify structural steel work is done in accordance with contract documents. Welding shall conform to AWS D1.1 Structural Welding Code.
- B. Prefabrication Inspection:
  - 1. Review design and shop detail drawings for size, length, type and location of all welds to be made.
  - 2. Approve welding procedure qualifications either by pre-qualification or by witnessing qualifications tests.
  - 3. Approve welder qualifications by certification or retesting.

Testing Laboratory Services

4. Approve procedure for control of distortion and shrinkage stresses.
  5. Approve procedures for welding in accordance with applicable sections of AWS D1.1.
- C. Fabrication and Erection:
1. Weld Inspection:
    - a. Inspect welding equipment for capacity, maintenance and working condition.
    - b. Verify specified electrodes and handling and storage of electrodes in accordance with AWS D1.1.
    - c. Inspect preparation and assembly of materials to be welded for conformance with AWS D1.1.
    - d. Inspect preheating and interpass temperatures for conformance with AWS D1.1.
    - e. Measure 25 percent of fillet welds.
    - f. Welding Magnetic Particle Testing: Test in accordance with ASTM E709 for a minimum of:
      - 1) 20 percent of all shear plate fillet welds at random, final pass only.
      - 2) 20 percent of all continuity plate and bracing gusset plate fillet welds, at random, final pass only.
      - 3) 100 percent of tension member fillet welds (i.e., hanger connection plates and other similar connections) for root and final passes.
      - 4) 20 percent of length of built-up column member partial penetration and fillet welds at random for root and final passes.
      - 5) 100 percent of length of built-up girder member partial penetration and fillet welds for root and final passes.
    - g. Welding Ultrasonic Testing: Test in accordance with ASTM E164 and AWS D1.1 for 100 percent of all full penetration welds, braced and moment frame column splices, and a minimum of 20 percent of all other partial penetration column splices, at random.
    - h. Welding Radiographic Testing: Test in accordance with ASTM E94, and AWS D1.1 for 5 percent of all full penetration welds at random.
    - i. Verify that correction of rejected welds are made in accordance with AWS D1.1.
    - j. Testing and inspection do not relieve the Contractor of the responsibility for providing materials and fabrication procedures in compliance with the specified requirements.
  2. Bolt Inspection:
    - a. Inspect high-strength bolted connections in accordance AISC Specifications for Structural Joints Using ASTM F3125 Bolts.
    - b. Slip-Critical Connections: Inspect 10 percent of bolts, but not less than 2 bolts, selected at random in each connection in accordance with AISC Specifications for Structural Joints Using ASTM F3125 Bolts. Inspect all bolts in connection when one or more are rejected.
    - c. Fully Pre-tensioned Connections: Inspect 10 percent of bolts, but not less than 2 bolts, selected at random in 25 percent of connections in accordance with AISC Specification for Structural Joints Using ASTM F3125 Bolts. Inspect all bolts in connection when one or more are rejected.
    - d. Bolts installed by turn-of-nut tightening may be inspected with calibrated wrench when visual inspection was not performed during tightening.
    - e. Snug Tight Connections: Inspect 10 percent of connections verifying that plies of connected elements have been brought into snug contact.
    - f. Inspect field erected assemblies; verify locations of structural steel for plumbness, level, and alignment.
- D. Submit inspection reports, record of welders and their certification, and identification, and instances of noncompliance to COR.

**3.15 STEEL DECKING:**

- A. Provide field inspection of welds of metal deck to the supporting steel, and testing services to insure steel decking has been installed in accordance with contract documents and manufacturer's requirements.
- B. Qualification of Field Welding: Qualify welding processes and welding operators in accordance with "Welder Qualification" procedures of AWS D1.1. Refer to the "Plug Weld Qualification Procedure" in Part 3 "Field Quality Control."
- C. Submit inspection reports, certification, and instances of noncompliance to COR.

**3.16 SHEAR CONNECTOR STUDS:**

- A. Provide field inspection and testing services required by AWS D.1 to insure shear connector studs have been installed in accordance with contract documents.
- B. Tests: Test 20 percent of headed studs for fastening strength in accordance with AWS D1.1.
- C. Submit inspection reports, certification, and instances of noncompliance to COR.

**3.17 SPRAYED-ON FIREPROOFING:**

- A. Provide field inspection and testing services to certify sprayed-on fireproofing has been applied in accordance with contract documents.
- B. Obtain a copy of approved submittals from COR.
- C. Use approved installation in test areas as criteria for inspection of work.
- D. Test sprayed-on fireproofing for thickness and density in accordance with ASTM E605.
  - 1. Thickness gauge specified in ASTM E605 may be modified for pole extension so that overhead sprayed material can be reached from floor.
- E. Location of test areas for field tests as follows:
  - 1. Thickness: Select one bay per floor, or one bay for each 930 m<sup>2</sup> (10,000 square feet) of floor area, whichever provides for greater number of tests. Take thickness determinations from each of following locations: Metal deck, beam, and column.
  - 2. Density: Take density determinations from each floor, or one test from each 930 m<sup>2</sup> (10,000 square feet) of floor area, whichever provides for greater number of tests, from each of the following areas: Underside of metal deck, beam flanges, and beam web.
- F. Submit inspection reports, certification, and instances of noncompliance to COR.

**3.18 TYPE OF TEST:**

- A. Approximate Number of Tests Required
- B. Earthwork:
  - 1. Laboratory Compaction Test, Soils:
    - a. (ASTM D1557) (ASTM D698) 20
    - b. Field Density, Soils (AASHTO T191, T205, or T310) 20
    - c. Penetration Test, Soils 20
- C. Landscaping:
  - 1. Topsoil Test 5
- D. Aggregate Base:
  - 1. Laboratory Compaction, (ASTM D1557) 10
  - 2. Field Density, (ASTM D1556) 10
  - 3. Aggregate, Base Course Gradation (AASHTO T27) 10
  - 4. Wear (AASHTO T96) 10
  - 5. Soundness (AASHTO T104) 10
- E. Asphalt Concrete:

Testing Laboratory Services

1. Field Density, ASTM D1188 10
  2. Aggregate, Asphalt Concrete Gradation (AASHTO T27) 10
  3. Wear (AASHTO T96) 10
  4. Soundness (AASHTO T104) 10
- F. Concrete:
1. Making and Curing Concrete Test Cylinders (ASTM C31) 20
  2. Compressive Strength, Test Cylinders (ASTM C39) 20
  3. Concrete Slump Test (ASTM C143) 20
  4. Concrete Air Content Test (ASTM C173) 20
  5. Unit Weight, Lightweight Concrete (ASTM C567) 20
  6. Aggregate, Normal Weight: Gradation (ASTM C33) 20
  7. Deleterious Substances (ASTM C33) 20
  8. Soundness (ASTM C33) 20
  9. Abrasion (ASTM C33) 20
  10. Aggregate, Lightweight Gradation (ASTM C330) 20
  11. Deleterious Substances (ASTM C330) 20
  12. Unit Weight (ASTM C330) 20
  13. Flatness and Levelness Readings (ASTM E1155) (number of days) 20
- G. Reinforcing Steel:
1. Tensile Test (ASTM A370) 10
  2. Bend Test (ASTM A370) 5
  3. Mechanical Splice (ASTM A370) 20
  4. Welded Splice Test (ASTM A370) 20
- H. Prestressed Concrete:
1. Testing Strands (ASTM A416) 10
- I. Masonry:
1. Making and Curing Test Cubes (ASTM C109) 20
  2. Compressive Strength, Test Cubes (ASTM C109) 20
  3. Sampling and Testing Mortar, Comp. Strength (ASTM C780) 20
  4. Sampling and Testing Grout, Comp. Strength (ASTM C1019) 20
  5. Masonry Unit, Compressive Strength (ASTM C140) 20
  6. Prism Tests (ASTM C1314) 20
- J. Structural Steel:
1. Ultrasonic Testing of Welds (ASTM E164) 20
  2. Magnetic Particle Testing of Welds (ASTM E709) 20
  3. Radiographic Testing of Welds (ASTM E94) 20
- K. Technical Personnel: (Minimum 12 months)
1. Technicians to perform tests and inspection listed above. Laboratory will be equipped with concrete cylinder storage facilities, compression machine, cube molds, proctor molds, balances, scales, moisture ovens, slump cones, air meter, and all necessary equipment for compaction control.

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## SECTION 01 45 35

### SPECIAL INSPECTIONS

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. This guide specification will be applicable to both new buildings and existing building rehabilitations/renovations. In addition to the Special Inspection and testing specified requirements, a registered design professional must perform structural observations during construction. All observed deficiencies will be immediately reported to the Contracting Officer. The registered design professional performing these observations will be a representative of the Designer of Record (DOR) for the building being constructed.
- B. Structural observations are required for the following project conditions per IBC Chapter 17:
  - 1. Seismic Design Category D, E or F; and assigned to Risk Cat III, IV or V.
  - 2. Seismic Design Category D, E or F; and with a height greater than 22860 mm 75 ft.
  - 3. Seismic Design Category E, assigned to Risk Category I or II and the building is greater than two stories above grade plane.
  - 4. Nominal design wind speed in excess of 49 m/sec 110 mph; and assigned to Risk Cat III, IV or V.
  - 5. Nominal design wind speed in excess of 49 m/sec 110 mph; and with a height greater than 23 m 75 ft.

##### 1.2 APPLICABLE PUBLICATIONS

- A. The publication 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.
- B. American Society of Civil Engineers (ASCE)
  - 1. ASCE 7 - (2016; Errata 02020; Supp 1 2018) Minimum Design Loads for Buildings and Other Structures
- C. International Code Council (ICC)
  - 1. ICC IBC - (2018) International Building Code

##### 1.3 GENERAL REQUIREMENTS

- A. Perform Special Inspections in accordance with the Statement of Special Inspections, Schedule of Special Inspections and Chapter 17 of ICC IBC. The Statement of Special Inspections and Schedule of Special Inspections are included as an attachment to this specification. Special Inspections are to be performed by an independent third party and are intended to ensure that the work of the prime contractor is in accordance with the Contract Documents and applicable building codes. Special inspections do not take the place of the three phases of control inspections performed by the Contractor's QC Manager or any testing and inspections required by other sections of the specifications.
- B. Structural observations will be performed by the Government. The contractor must provide notification to the Contracting Officer 14 days prior to the following points of construction that structural observations need to occur:
  - 1. The Government shall perform structural observations during construction on the following dates after placement of reinforcement but before placement of concrete.

##### 1.4 DEFINITIONS

- A. Continuous Special Inspections – The constant monitoring of specific tasks by a special inspector. These inspections must be carried out continuously over the duration of the particular tasks.

Special Inspections

- B. Periodic Special Inspections – Special Inspections by the special inspector who is intermittently present where the work to be inspected has been or is being performed. Specific time interval on a specific Special Inspection should be indicated on the Schedule of Special Inspections.
- C. Perform – Perform these Special Inspections tasks for each welded joint or member.
- D. Observe – Observe these Special Inspections items on a random daily basis. Operations need not be delayed pending these inspections.
- E. Special Inspector (SI) – A qualified person retained by the contractor and approved by the Contracting Officer as having the competence necessary to inspect a particular type of construction requiring Special Inspections. The SI must be an independent third party hired directly by the Prime Contractor.
- F. Associate Special Inspector (ASI) – A qualified person who assists the SI in performing Special Inspections but must perform inspection under the direct supervision of the SI and cannot perform inspections without the SI on site.
- G. Third Party – A third party inspector must not be company employee of the Contractor or any Sub-Contractor performing the work to be inspected.
- H. Special Inspector of Record (SIOR) – SIOR must be an independent third party hired directly by the Prime Contractor and is required for the following project conditions:
  - 1. Seismic Design Category D, E, or F; and assigned to Risk Category III, IV, or V.
  - 2. Seismic Design Category D, E, or F; and with a height greater than 22860mm 75 ft.
  - 3. Seismic Design Category E, assigned to Risk Category I or II and the building is greater than two (2) stories above grade plane.
  - 4. Nominal design wind speed in excess of 49 m/sec 100 mph; and assigned to Risk Category III, IV, or V.
  - 5. Nominal design wind speed in excess of 49 mm/sec 100mph; and with a height greater than 23m 75ft.
  - 6. In addition to these conditions, the DOR is encouraged to consider using an SIOR on large magnitude or critical projects where this additional level of quality control is affordable.
- I. Contracting Officer – The Government official having overall authority for administrative contracting actions. Certain contracting actions may be delegated to the Contracting Officer's Representative (COR).
- J. Contractor's Quality Control (QC) Manager – An individual retained by the prime contractor and qualified in accordance with the Section 01 45 00 QUALITY CONTROL having the overall responsibility for the contractor's QC organization.
- K. Designer of Record (DOR) – A registered design professional is contracted by the Government as an A/E responsible for the overall design and review of submittal documents prepared by others. The DOR is registered or licensed to practice their respective design profession as defined by the statutory requirements of the professional registration laws in state in which the design professional works. The DOR is also referred to as the Engineer of Record (EOR) in design code documents.
- L. Statement of Special Inspections (SSI) – A document developed by the DOR identifying the material, systems, components and work required to have Special Inspections and covering the following:
  - 1. List of the Architectural Designated Seismic Systems – these components are in or attached to a Risk Category IV or V structure and are needed for continued operation of the facility or their failure could impair the continued operation of the facility.
  - 2. List of the Mechanical Designated Seismic Systems
    - a. For Seismic Design Category C or Risk V, list the following:
      - 1) Heating, ventilation, and air-conditioning (HVAC) ductwork containing hazardous materials and anchorage of such ductwork

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- 2) Piping systems and mechanical units containing flammable, combustible, or highly toxic materials.
- b. For Seismic Design Category D, E, or F or Risk Category V list mechanical system that meet one of the following:
  - 1) Life safety component required to function after an earthquake
  - 2) Component that contains hazardous content,
  - 3) All components in an essential facility needed for continued operation after an earthquake.
3. List of the Electrical Designated Systems
  - a. For Seismic Design Category C or Risk V, list the anchorage of electrical equipment used for emergency or standby power systems.
  - b. For Seismic Design Category D, E or F list electrical system that meet one of the following:
    - 1) Life safety component required to function after an earthquake
    - 2) Component that contains hazardous content,
    - 3) All components in an essential facility needed for continued operation after an earthquake.
4. List of elements that are part of the progressive collapse resistance system.
  - a. Provide a description of the following as they apply:
    - 1) Elements of the tie force system consisting of internal longitudinal and transverse, vertical, and peripheral ties.
    - 2) Elements of the alternate path system.
    - 3) Elements having enhanced local resistance. The Statement of Special Inspections and the Schedule of Special Inspections will be included as an attachment to this specification
      - a) Schedule of Special Inspections – A schedule which lists each of the required Special Inspections, the extent to which each Special Inspections is to be performed, and the required frequency for each in accordance with ICC IBC Chapter 17. Template found here:



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- b) Designated Seismic System – Those nonstructural components that require design in accordance with ASCE 7 Chapter 13 and for which the component importance factor,  $I_p$ , is greater than 1.0. This designation applies to systems that are required to be operational following the Design Earthquake for RC I - IV structures and following the MCER for RC V structures. All systems in RC V facilities designated as MC-1 in accordance with UFC 3-310-04 are considered part of the Designated Seismic Systems. Designated Seismic Systems will be identified by Owner and will have an Importance Factor  $I_p = 1.5$
- b. Submittals: Government approval is required for all submittals. CQC Special Inspection reports shall be submitted under this Specification section and follow the Special Inspection: Applicable Specification section or description naming convention. Submit the following:
  - 1) SD-01 Preconstruction Submittals;
  - 2) SIOR Letter of Acceptance;
  - 3) Special Inspections Project Manual;
  - 4) Special Inspections Agency's Written Practices

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- 5) NDT Procedures and Equipment' Calibration Records;
  - 6) SD-06 Test Reports;
  - 7) Special Inspections
  - 8) Daily Reports;
  - 9) Special Inspections; Biweekly Reports;
  - 10) SD-07 Certificates;
  - 11) Fabrication Plant
  - 12) Steel Truss Plant;
  - 13) Wood Truss Plant;
  - 14) AC472 Accreditation;
  - 15) Steel Joist Institute Membership;
  - 16) Precast Concrete Institute (PCI) Certified Plant;
  - 17) Certificate of Compliance;
  - 18) Special Inspector of Record Qualifications;
  - 19) Special Inspector Qualifications;
  - 20) Qualification Records for NDT technicians;
  - 21) SD-11 Closeout Submittals;
  - 22) Interim Final Report of Special Inspections;
  - 23) Comprehensive Final Report of Special Inspections;
- c. Special Inspector Qualifications: Submit qualifications for each SI, ASI, and the SIOR from the following certifying associations: Associated Air Balance Council (AABC); American Concrete Institute (ACI); Association of the Wall and Ceiling Industry (AWCI); American Welding Society (AWS); Factory Mutual (FM); International Code Council (ICC); Nondestructive Testing (NDT); National Institute for Certification in Engineering Technologies (NICET); Precast/Prestressed Concrete Institute (PCI); Post-Tensioning Institute (PTI); Underwriters Laboratories (UL). Qualifications should be in accordance with the following minimums.

**1.5 QUALIFICATIONS**

Area	Special Inspector	Associated Special Inspector	SIOR
Steel Construction and High Strength Bolting	ICC Structural Steel and Bolting Special Inspector certificate with on year of related experience, or Registered Professional Engineer with related experience.	Engineer-In-Training with one year of related experience.	
Welding Structural Steel (For highly complex steel use only AWS Certified Welding Inspectors)	ICC Welding Special Inspector certificate with one year of related experience or AWS Certified Welding Inspector	AWS Certified Associate Welding Inspector	
Nondestructive Testing of Welds	NDT Level II Certificate	NDT Level II Certificate plus one year of related experience	
Cold Formed Steel Framing	ICC Structural Steel and Bolting Special Inspector certificate with on year of related experience, or ICC	Engineer-In-Training with one year of related experience.	

Area	Special Inspector	Associated Special Inspector	SIOR
	Commercial Building Inspector with one year of experience; or Registered Professional Engineer with related experience.		
Concrete Construction	ICC Reinforced Concrete Special Inspector Certificate with one year of related experience, or ACI Concrete Construction Special Inspector, or NICET Concrete Technician Level III Certificate in Construction Materials Testing, or, Registered Professional Engineer with related experience	ACI Concrete Construction Special Inspector in Training, or Engineer-In-Training with one year of related experience	
Prestressed Concrete Construction	ICC Pre-stressed Special Inspector Certificate with one year of related experience, or PCI Quality Control Technician/ Inspector Level II Certificate with one year of related experience, or Registered Professional Engineer with related experience.	PCI Quality Control Technician/ Inspector Level I Certificate with one year of related experience, or Engineer-In-Training with one year of related experience	
Post-Tensioned Concrete Construction	PTI Level 2 Unbonded PT Inspector Certificate, or Registered Professional Engineer with related experience	PTI Level 1 Unbonded PT Inspector Certificate with one year of related experience, or Engineer-In-Training with one year of related experience	
Masonry Construction	ICC Structural Masonry Special Inspector Certificate with one year of related experience, or Registered Professional Engineer with related experience	Engineer-In-Training with one year of related experience	
Wood	ICC Commercial Building Inspector Certificate with one year of related experience, or ICC Residential Building Inspector with on year of experience, or Registered Professional Engineer with related experience	Engineer-In-Training with one year of related experience	

Area	Special Inspector	Associated Special Inspector	SIOR
Verification of Site Soil Condition, Fill Placement, and Load-Bearing Requirements	ICC Soils Special Inspector Certificate with one year of related experience, or NICET Soils Technician Level II Certificate in Construction Material Testing, or NICET Geotechnical Engineering Technician Level II Construction or Generalist Certificate, or Geologist-In-Training with one year of related experience, or Registered Professional Engineer with related experience	NICET Soils Technician Level I Certificate in Construction Material Testing with one year of related experience, or NICET Geotechnical Engineering Technician Level I Construction, or Generalist Certificate with one year of related experience, or Engineer-In-Training with one year of related experience	
Deep Foundations	NICET Soils Technician Level II Certificate in Construction Material Testing, or NICET Geotechnical Engineering Technician Level II Construction or Generalist Certificate, or Geologist-In-Training with one year of related experience, or Registered Professional Engineer with related experience	NICET Soils Technician Level I Certificate in Construction Material Testing with one year of related experience, or NICET Geotechnical Engineering Technician Level I Construction or Generalist Certificate with one year of related experience, or Engineer-In-Training with one year of related experience	
Sprayed Fire Resistant Manual	ICC Spray-applied Fireproofing Special Inspector Certificate, or ICC Fire Inspector I Certificate with one year of related experience, or Registered Professional Engineer with related experience	Engineer-In-Training with one year of related experience	
Mastic and Intumescent Fire Resistant Coatings	ICC Spray-applied Fireproofing Special Inspector Certificate, or ICC Fire Inspector I Certificate with one year of related experience, or Registered Professional Engineer with related experience	Engineer-In-Training with one year of related experience.	
Exterior Insulation and Finish Systems (EIFS)	AWCI EIFS Inspector Certificate, or Exterior Design Institute Certificate, or Registered Professional Engineer with related	Engineer-In-Training with one year of related experience	

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Area	Special Inspector	Associated Special Inspector	SIOR
	experience		
Fire-Resistant Penetrations and Joints	Passed the UL Firestop Exam with one year of related experience, or Passed the FM Firestop Exam with one year of related experience, or Registered Professional Engineer with related experience	Engineer-In-Training with one year of related experience.	
Smoke Control	AABC Technician Certification with one year of related experience, or Registered Professional Engineer with related experience	Engineer-In-Training with one year of related experience.	
SIOR			Registered Professional Engineer

**PART 2 - PRODUCTS**

**2.1 FABRICATORS SPECIAL INSPECTION**

- A. Special Inspections of fabricator's work performed in the fabricator's shop is required to be inspected in accordance with the Statement of Special Inspections and the Schedule of Special Inspections unless the fabricator is certified by the approved agency to perform such work without Special Inspections. Submit the applicable certification(s) from the following list to the Contracting Officer for information to allow work performed in the fabricator's shop to not be subjected to Special Inspections.
- B. The following certifications meet the requirements for fabricator approval in accordance with paragraph 1704.2.5.2 of IBC:
  1. American Institute of Steel Construction (AISC) Certified Fabrication Plant, Category STD.
  2. Truss Plate Institute (TPI) steel truss plate quality assurance program certification.
  3. Truss Plate Institute (TPI) wood truss plate quality assurance program certification.
  4. International Accreditation Service, AC472 Accreditation Steel Joist Institute Membership
  5. Precast Concrete Institute (PCI) Certified Plant, Group C
- C. At the completion of fabrication, submit a certificate of compliance, to be included with the comprehensive final report of Special **Inspections, stating that the materials supplied and work performed by** the fabricator are in accordance the construction documents.

**PART 3 - EXECUTION**

**3.1 RESPONSIBILITIES MATRIX**

Inspector	Responsibility	Condition

Inspector	Responsibility	Condition
SIOR	<p>Supervise all Special Inspectors required by the contract documents and the IBC.</p> <p>Submit a SIOR Letter of Acceptance to the Contracting Officer attesting to acceptance of the duties of SIOR, signed and sealed by the SIOR.</p> <p>Verify the qualifications of all of the Special Inspectors.</p> <p>Verify the qualifications of fabricators.</p>	Applicable when SIOR is required
SIOR	<p>Submit Special Inspections agency's written practices for the monitoring and control of the agency's operations to include the following:</p> <p>The agency's procedures for the selection and administration of inspection personnel, describing the training, experience and examination requirements for qualifications and certification of inspection personnel.</p> <p>The agency's inspection procedures, including general inspection, material controls, and visual welding inspection.</p> <p>Submit qualification records for nondestructive testing (NDT) technicians designated for the project. Submit NDT procedures and equipment calibration records for NDT to be performed and equipment to be used for the project.</p>	Applicable when SIOR is required and when the structural design is required to follow AISC341 for seismic design of steel structures
SIOR	<p>Prepare a Special Inspections Project Manual, which will cover the following:</p> <p>Roles and responsibilities of the following individuals during Special Inspections: SIOR, SI, General Contractor, Subcontractors, QC Manager, and DOR.</p> <p>Organizational chart and/or communication plan, indicating lines of communication</p> <p>Contractor's internal plan for scheduling inspections. Address items such as timeliness of inspection requests, who to contact for inspection requests, and availability of alternate inspectors.</p> <p>Contractor's internal plan for scheduling inspections. Address items such as timeliness of inspection requests, who to contact for inspection requests, and availability of alternate inspectors.</p> <p>Indicate the government reporting procedures.</p> <p>Propose forms or templates to be used by SI and SIOR to document inspections.</p> <p>Indicate procedures for tracking nonconforming work and verification that corrective work is complete.</p> <p>Indicate how the SIOR and/or SI will participate in weekly QC meetings.</p> <p>Indicate how Special Inspections of shop fabricated items will be handled when the fabricator's shop is not certified per paragraph FABRICATOR SPECIAL INSPECTIONS.</p> <p>Include a section in the manual that covers each specific item requiring Special Inspections that is indicated on the Schedule of Special Inspections. Provide names and qualifications of each special inspector who will be performing the Special Inspections for each specific item. Provide detail on how the Special Inspections are to be carried out for each item so that the expectations are clear for the General Contractor and the Subcontractor performing the work.</p>	Applicable when SIOR is required

Inspector	Responsibility	Condition
	<p>Make a copy of the Special Inspections Project Manual available on the job site during construction. Submit a copy of the Special Inspections Project Manual for approval.</p> <p>Attend coordination and mutual understanding meeting where the information in the Special Inspections Project Manual will be reviewed to verify that all parties have a clear understanding of the Special Inspections provisions and the individual duties and responsibilities of each party.</p> <p>Maintain a 3- ring binder for the Special Inspector's daily and biweekly reports and the Special Inspections Project Manual. This file must be located in a conspicuous place in the project trailer/office to allow review by the Contracting Officer and the DOR.</p> <p>Submit a copy of the Special Inspector's daily reports to the QC Manager.</p> <p>Discrepancies that are observed during Special Inspections must be reported to the QC Manager for correction. If discrepancies are not corrected before the special inspector leaves the site the observed discrepancies must be documented in the daily report.</p> <p>Submit a biweekly Special Inspections report until all work requiring Special Inspections is complete. A report is required for each biweekly period in which Special Inspections activity occurs, and must include the following:</p> <p>A brief summary of the work performed during the reporting time frame.</p> <p>Changes and/or discrepancies with the drawings, specifications, and mechanical or electrical component certification if they require seismic systems, that were observed during the reporting period.</p> <p>Discrepancies which were resolved or corrected.</p> <p>A list of nonconforming items requiring resolution.</p> <p>All applicable test results including nondestructive testing reports.</p>	
QC Manager	<p>If there is no SIOR, QC Manager must Supervise all Special Inspectors required by the contract documents and the IBC; Verify the qualifications of all of the Special Inspectors; Verify the qualifications of fabricators; Maintain a 3- ring binder for the Special Inspector's daily and biweekly reports. This file must be located in a conspicuous place in the project trailer/office to allow review by the Contracting Officer and the DOR.</p>	Applicable when SIOR is not required
QC Manager	<p>Maintain a rework items list that includes discrepancies noted on the Special Inspectors daily report.</p>	n/a
Special Inspectors	<p>Inspect all elements of the project for which the special inspector is qualified to inspect and are identified in the Schedule of Special Inspections.</p> <p>Attend preparatory phase meetings related to the Definable Feature of Work (DFOW) for which the special inspector is qualified to inspect.</p>	n/a
Special Inspectors	<p>Submit Special Inspections agency's written practices for the monitoring and control of the agency's operations to include the following:</p>	Applicable when SIOR is NOT required and

Special Inspections

Inspector	Responsibility	Condition
	<p>The agency's procedures for the selection and administration of inspection personnel, describing the training, experience and examination requirements for qualifications and certification of inspection personnel.</p> <p>The agency's inspection procedures, including general inspection, material controls, and visual welding inspection.</p> <p>Submit qualification records for nondestructive testing (NDT) technicians designated for the project.</p> <p>Submit NDT procedures and equipment calibration records for NDT to be performed and equipment to be used for the project.</p>	<p>when the structural design is required to follow AISC 341 for seismic design of steel structures</p>
Special Inspectors	<p>Submit a copy of the daily reports to the QC Manager.</p> <p>Discrepancies that are observed during Special Inspections must be reported to the QC Manager for correction. If discrepancies are not corrected before the special inspector leaves the site the observed discrepancies must be documented in the daily report.</p> <p>Submit a biweekly Special Inspection Report until all inspections are complete. A report is required for each biweekly period in which Special Inspections activity occurs, and must include the following:          A brief summary of the work performed during the reporting time frame          Changes and/or discrepancies with the drawings, specifications, and mechanical or electrical component certification if they require seismic systems that were observed during the reporting period.          Discrepancies which were resolved or corrected.          A list of nonconforming items requiring resolution.          All applicable test result including nondestructive testing reports.          At the completion of the project submit a comprehensive final report of Special Inspections that documents the Special Inspections completed for the project and corrections of all discrepancies noted in the daily reports. The comprehensive final report of Special Inspections must be signed, dated and indicate the certification of the special inspector qualifying them to conduct the inspection.</p>	<p>Applicable when SIOR is not required</p>
Special Inspectors	<p>Submit daily reports to the SIOR</p>	<p>Applicable when SIOR is required</p>

**3.2 DEFECTIVE WORK**

- A. Check work as it progresses, but failure to detect any defective work or materials must in no way prevent later rejection if defective work or materials are discovered, nor obligate the Government to accept such work.

-- End of Section --

## **SCHEDULE OF SPECIAL INSPECTIONS**

Reference 01 45 35 for all requirements not noted as part of this schedule.

### **INSPECTION DEFINITIONS:**

**PERFORM:** Perform these tasks for each weld, fastener or bolted connection, and noted verification.

**OBSERVE:** Observe these items randomly during the course of each work day to insure that applicable requirements are being met. Operations need not be delayed pending these inspections at contractor's risk.

**DOCUMENT:** Document, with a report, that the work has been performed in accordance with the contract documents. This is in addition to any other reports required in the Special Inspections guide specification.

**CONTINUOUS:** Constant monitoring of identified tasks by a special inspector over the duration of performance of said tasks.

**A. STRUCTURAL - STEEL – WELDING SECTION**  
**THIS SECTION APPLICABLE IF BOX IS CHECKED:**

STEEL INSPECTION <u>PRIOR TO WELDING</u> – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC 1705.2.1, AISC 360-10: Table C-N5.4-1		
TASK	INSPECTION TYPE <sup>1</sup>	DESCRIPTION
1. Verify that the welding procedures specification (WPS) is available	<b>PERFORM</b>	
2. Verify manufacturer certifications for welding consumables are available	<b>PERFORM</b>	
3. Verify material identification	<b>PERFORM</b>	Type and grade.
4. Welder Identification System	<b>PERFORM</b>	The fabricator or erector, as applicable, shall maintain a system by which a welder who has welded a joint or member can be identified. Stamps, if used, shall be the low-stress type.
5. Fit-up of groove welds (including joint geometry)	OBSERVE	<ul style="list-style-type: none"> <li>✓ Joint preparation</li> <li>✓ Dimensions (alignment, root opening, root face, bevel)</li> <li>✓ Cleanliness (condition of steel surfaces)</li> <li>✓ Tacking (tack weld quality and location)</li> <li>✓ Backing type and fit (if applicable)</li> </ul>
6. Configuration and finish of access holes	OBSERVE	
7. Fit-up of fillet welds	OBSERVE	<ul style="list-style-type: none"> <li>✓ Dimensions (alignment, gaps at root)</li> <li>✓ Cleanliness (condition of steel surfaces)</li> <li>✓ Tacking (tack weld quality and location)</li> </ul>
STEEL INSPECTION <u>DURING WELDING</u> – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC 1705.2.1, AISC 360-10: Table C-N5.4-2		
TASK	INSPECTION TYPE	DESCRIPTION
8. Use of qualified welders	<b>PERFORM</b>	Welding by welders, welding operators, and tack welders who are qualified in conformance with requirements.
9. Control and handling of welding consumables	OBSERVE	<ul style="list-style-type: none"> <li>✓ Packaging</li> <li>✓ Electrode atmospheric exposure control</li> </ul>
10. No welding over cracked tack welds	OBSERVE	
11. Environmental conditions	OBSERVE	<ul style="list-style-type: none"> <li>✓ Wind speed within limits</li> <li>✓ Precipitation and temperature</li> </ul>
12. Welding Procedures Specification followed	OBSERVE	<ul style="list-style-type: none"> <li>✓ Settings on welding equipment</li> <li>✓ Travel speed</li> <li>✓ Selected welding materials</li> <li>✓ Shielding gas type/flow rate</li> <li>✓ Preheat applied</li> <li>✓ Interpass temperature maintained (min./max.)</li> <li>✓ Proper position (F, V, H, OH)</li> <li>✓ Intermix of filler metals avoided</li> </ul>
13. Welding techniques	OBSERVE	<ul style="list-style-type: none"> <li>✓ Interpass and final cleaning</li> <li>✓ Each pass within profile limitations</li> </ul>

<sup>1</sup> **PERFORM:** Perform these tasks for each weld, fastener or bolted connection, and required verification.  
**OBSERVE:** Observe these items on a random sampling basis daily to insure that applicable requirements are met. Operations need not be delayed pending these inspections at contractor's risk.

✓ Each pass meets quality requirements

**A. STRUCTURAL - STEEL – WELDING SECTION (CONTINUED)**

STEEL INSPECTION AFTER WELDING – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC 2015 1705.2.1, AISC 360-10: Table C-N5.4-3		
TASK	INSPECTION TYPE 1	DESCRIPTION
14. Welds cleaned	OBSERVE	
15. Size, length, and location of all welds	<b>PERFORM</b>	Size, length, and location of all welds conform to the requirements of the detail drawings.
16. Welds meet visual acceptance criteria	<b>PERFORM AND DOCUMENT</b>	<ul style="list-style-type: none"> <li>✓ Crack prohibition</li> <li>✓ Weld/base-metal fusion</li> <li>✓ Crater cross section</li> <li>✓ Weld profiles</li> <li>✓ Weld size</li> <li>✓ Undercut</li> <li>✓ Porosity</li> </ul>
17. Arc strikes	<b>PERFORM</b>	
18. k-area	<b>PERFORM</b>	When welding of doubler plates, continuity plates or stiffeners has been performed in the k-area, visually inspect the web k-area for cracks.
19. Backing removed, weld tabs removed and finished, and fillet welds added where required	<b>PERFORM</b>	
20. Repair activities	<b>PERFORM AND DOCUMENT</b>	
21. Document acceptance or rejection of welded joint or member	<b>PERFORM</b>	

**END SECTION**

<sup>1</sup> **PERFORM:** Perform these tasks for each weld, fastener or bolted connection, and required verification.  
**DOCUMENT:** Document in a report that the work has been performed as required. This is in addition to all other required reports.

**B. STRUCTURAL - STEEL – BOLTING SECTION**  
**THIS SECTION APPLICABLE IF BOX IS CHECKED:**

STEEL INSPECTION TASKS <u>PRIOR TO BOLTING</u> – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC 1705.2.1, AISC 360-10: Table C-N5.6-1		
TASK	INSPECTION TYPE <sup>1</sup>	DESCRIPTION
1. Manufacture’s certifications available for fastener materials	<b>PERFORM</b>	
2. Fasteners marked in accordance with ASTM requirements	OBSERVE	
3. Proper fasteners selected for joint detail (grade, type, bolt length if threads are to be excluded from shear plane)	OBSERVE	
4. Proper bolting procedure selected for joint detail	OBSERVE	
5. Connecting elements, including appropriate faying surface condition and hole preparation, if specified, meet applicable requirements	OBSERVE	
6. Proper storage provided for bolts, nuts, washers, and other fastener components	OBSERVE	
STEEL INSPECTION TASKS <u>DURING BOLTING</u> – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC 1705.2.1, AISC 360-10: Table C-N5.6-2		
TASK	INSPECTION TYPE <sup>1</sup>	DESCRIPTION
7. Fastener assemblies of suitable condition, placed in all holes and washers (if required) are positioned as required	OBSERVE	
8. Joint brought to the snug-tight condition prior to pretensioning operation	OBSERVE	
9. Fastener component not turned by the wrench prevented from rotating	OBSERVE	
10. Bolts are pretensioned in accordance with RCSC Specification, progressing systematically from the most rigid point toward the free edges	OBSERVE	
STEEL INSPECTION TASKS <u>AFTER BOLTING</u> – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC 1705.2.1, AISC 360-10: Table C-N5.6-3		
TASK	INSPECTION TYPE <sup>1</sup>	DESCRIPTION
11. Document acceptance or rejection of all bolted connections	<b>DOCUMENT</b>	

<sup>1</sup> **PERFORM:** Perform these tasks for each weld, fastener or bolted connection, and required verification.  
**OBSERVE:** Observe these items on a random sampling basis daily to insure that applicable requirements are met. Operations need not be delayed pending these inspections at contractor’s risk.  
**DOCUMENT:** Document in a report that the work has been performed as required. This is in addition to all other required reports.

**END SECTION**

**C. STRUCTURAL - STEEL - NON DESTRUCTIVE TESTING SECTION**  
**THIS SECTION APPLICABLE IF BOX IS CHECKED:**

NONDESTRUCTIVE TESTING OF WELDED JOINTS – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC 1705.2.1, AISC 360-10: Section N5.5		
TASK	INSPECTION TYPE <sup>1</sup>	DESCRIPTION
1. Use of qualified nondestructive testing personnel	<b>PERFORM</b>	Visual weld inspection and nondestructive testing (NDT) shall be conducted by personnel qualified in accordance with AWS D1.8 clause 7.2
2. CJP groove welds	OBSERVE	Dye penetrant testing (DT) and ultrasonic testing (UT) shall be performed on 20% of CJP groove welds for materials greater than 5/16" (8mm) thick. Testing rate must be increased to 100% if greater than 5% of welds tested have unacceptable defects.
3. Welded joints subject to fatigue	OBSERVE	Dye penetrant testing (DT) and Ultrasonic testing (UT) shall be performed on 100% of welded joints identified on contract drawings as being subject to fatigue.
4. Weld tab removal sites	OBSERVE	At the end of welds where weld tabs have been removed, magnetic particle testing shall be performed on the same beam-to-column joints receiving UT

**END SECTION**

<sup>1</sup> **PERFORM:** Perform these tasks for each weld, fastener or bolted connection, and required verification.  
**OBSERVE:** Observe these items on a random sampling basis daily to insure that applicable requirements are met. Operations need not be delayed pending these inspections at contractor's risk.

**D. STRUCTURAL - STEEL – AISC 341 REQUIREMENTS (SEISMIC PROVISIONS)  
 SECTION**

**THIS SECTION APPLICABLE IF BOX IS CHECKED:**

NONDESTRUCTIVE TESTING OF WELDED JOINTS – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC 1705.2.1, AISC 341-10: Section J6.2		
TASK	INSPECTION TYPE <sup>1</sup>	DESCRIPTION
5. CJP groove welds	OBSERVE	Dye penetrant testing (DT) and ultrasonic testing (UT) shall be performed on 100% of CJP groove welds for materials greater than 5/16" thick (8mm).
6. Beam cope and access hole.	OBSERVE	At welded splices and connections, thermally cut surfaces of beam copes and access holes shall be tested using magnetic particle testing (MT) or dye penetrant testing (DT), when the flange thickness exceeds 1 1/2 in. for rolled shapes, or when the web thickness exceeds 1 1/2 in. for built-up shapes.
7. K-area NDT (AISC 341)	<b>PERFORM</b>	Where welding of doubler plates, continuity plates or stiffeners has been performed in the k-area, the web shall be tested for cracks using magnetic particle testing (MT). The MT inspection area shall include the k-area base metal within 3-inches of the weld. The MT shall be performed no sooner than 48 hours following completion of the welding.
8. Placement of reinforcing or contouring fillet welds	<b>DOCUMENT</b>	

**END SECTION**

<sup>1</sup> **PERFORM:** Perform these tasks for each weld, fastener or bolted connection, and required verification.  
**OBSERVE:** Observe these items on a random sampling basis daily to insure that applicable requirements are met. Operations need not be delayed pending these inspections at contractor's risk.  
**DOCUMENT:** Document in a report that the work has been performed as required. This is in addition to all other required reports.

**E. STRUCTURAL - STEEL - COMPOSITE CONSTRUCTION <sup>1</sup>**  
**THIS SECTION APPLICABLE IF BOX IS CHECKED:**

COMPOSITE CONSTRUCTION <u>PRIOR TO</u> PLACING CONCRETE – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC 1705.2.1, AISC 360-10: Table N6.1, AISC 341-10: Table J9-1		
TASK	INSPECTION TYPE <sup>2</sup>	DESCRIPTION
1. Placement and installation of steel headed stud anchors	<b>PERFORM</b>	
2. Material identification of reinforcing steel (Type/Grade)	OBSERVE	
3. Determination of carbon equivalent for reinforcing steel other than ASTM A706	OBSERVE	
4. Proper reinforcing steel size, spacing, clearances, support, and orientation	OBSERVE	
5. Reinforcing steel has been tied and supported as required	OBSERVE	

**END SECTION**

**F. STRUCTURAL - STEEL - OTHER INSPECTIONS**  
**THIS SECTION APPLICABLE IF BOX IS CHECKED:**

OTHER STEEL INSPECTIONS – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC 1705.2.1, AISC 341-10: Tables J8-1 & J10-1		
TASK	INSPECTION TYPE <sup>2</sup>	DESCRIPTION
1. Anchor rods and other embedments supporting structural steel	<b>PERFORM</b>	Verify the diameter, grade, type, and length of the anchor rod or embedded item, and the extent or depth of embedment prior to placement of concrete.
2. Fabricated steel or erected steel frame	OBSERVE	Verify compliance with the details shown on the construction documents, such as braces, stiffeners, member locations and proper application of joint details at each connection.
3. Reduced beam sections (RBS) where/if occurs	<b>DOCUMENT</b>	✓ Contour and finish ✓ Dimensional tolerances
4. Protected zones	<b>DOCUMENT</b>	No holes or unapproved attachments made by fabricator or erector
5. H-piles where/if occurs	<b>DOCUMENT</b>	No holes or unapproved attachments made by the

<sup>1</sup> See Concrete Construction Section for all concrete related inspection of composite steel construction.

<sup>2</sup> **PERFORM:** Perform these tasks for each weld, fastener or bolted connection, and required verification.

**OBSERVE:** Observe these items on a random sampling basis daily to insure that applicable requirements are met. Operations need not be delayed pending these inspections at contractor's risk.

**DOCUMENT:** Document in a report that the work has been performed as required. This is in addition to all other required reports.

		responsible contractor
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**END SECTION**

**G. STRUCTURAL - COLD-FORMED METAL DECK - PLACEMENT SECTION**  
**THIS SECTION APPLICABLE IF BOX IS CHECKED:**

METAL DECK INSPECTION <u>PRIOR TO</u> DECK PLACEMENT – VERIFY THE FOLLOWING ARE IN COMPLIANCE SDI QA/QC-2011, Appendix 1, Table 1.1		
TASK	INSPECTION TYPE <sup>1</sup>	DESCRIPTION
1. Verify compliance of materials (deck and all deck accessories) with construction documents, including profiles, material properties, and base metal thickness	<b>PERFORM</b>	
2. Document acceptance or rejection of deck and deck accessories	<b>DOCUMENT</b>	
METAL DECK INSPECTION <u>DURING</u> DECK PLACEMENT – VERIFY THE FOLLOWING ARE IN COMPLIANCE SDI QA/QC-2011, Appendix 1, Table 1.2		
TASK	INSPECTION TYPE <sup>1</sup>	DESCRIPTION
3. Verify compliance of deck and all deck accessories installation with construction documents	<b>PERFORM</b>	
4. Verify deck materials are represented by the mill certifications that comply with the construction documents	<b>PERFORM</b>	
5. Document acceptance or rejection of installation of deck and deck accessories	<b>DOCUMENT</b>	
METAL DECK INSPECTION <u>AFTER</u> DECK PLACEMENT – VERIFY THE FOLLOWING ARE IN COMPLIANCE SDI QA/QC-2011, Appendix 1, Table 1.3		
TASK	INSPECTION TYPE <sup>1</sup>	DESCRIPTION
6. Welding procedure specification (WPS) available	<b>PERFORM</b>	
7. Manufactures certifications for welding consumables available	OBSERVE	
8. Material identification (type/grade)	OBSERVE	
9. Check welding equipment	OBSERVE	

**END SECTION**

<sup>1</sup> **PERFORM:** Perform these tasks for each weld, fastener or bolted connection, and required verification.  
**OBSERVE:** Observe these items on a random sampling basis daily to insure that applicable requirements are met. Operations need not be delayed pending these inspections at contractor's risk.  
**DOCUMENT:** Document in a report that the work has been performed as required. This is in addition to all other required reports.



**H. STRUCTURAL - COLD-FORMED METAL DECK – WELDING SECTION**  
**THIS SECTION APPLICABLE IF BOX IS CHECKED:**

METAL DECK INSPECTION <u>DURING</u> WELDING – VERIFY THE FOLLOWING ARE IN COMPLIANCE SDI QA/QC-2011, Appendix 1, Table 1.4		
TASK	INSPECTION TYPE <sup>1</sup>	DESCRIPTION
1. Use of qualified welders	OBSERVE	
2. Control and handling of welding consumables	OBSERVE	
3. Environmental conditions (wind speed, moisture, temperature)	OBSERVE	
4. WPS followed	OBSERVE	
METAL DECK INSPECTION <u>AFTER</u> WELDING – VERIFY THE FOLLOWING ARE IN COMPLIANCE SDI QA/QC-2011, Appendix 1, Table 1.5		
TASK	INSPECTION TYPE <sup>1</sup>	DESCRIPTION
5. Verify size and location of welds, including support, sidelap, and perimeter welds.	<b>PERFORM</b>	
6. Welds meet visual acceptance criteria	<b>PERFORM</b>	
7. Verify repair activities	<b>PERFORM</b>	
8. Document acceptance or rejection of welds	<b>DOCUMENT</b>	

**END SECTION**

<sup>1</sup> **PERFORM:** Perform these tasks for each weld, fastener or bolted connection, and required verification.  
**OBSERVE:** Observe these items on a random sampling basis daily to insure that applicable requirements are met. Operations need not be delayed pending these inspections at contractor's risk.  
**DOCUMENT:** Document in a report that the work has been performed as required. This is in addition to all other required reports.

**I. STRUCTURAL - COLD-FORMED METAL DECK – FASTENING SECTION**  
**THIS SECTION APPLICABLE IF BOX IS CHECKED:**

METAL DECK INSPECTION <u>BEFORE</u> MECHANICAL FASTENING – VERIFY THE FOLLOWING ARE IN COMPLIANCE SDI QA/QC-2011, Appendix 1, Table 1.6		
TASK	INSPECTION TYPE <sup>1</sup>	DESCRIPTION
1. Manufacturer installation instructions available for mechanical fasteners	OBSERVE	
2. Proper tools available for fastener installation	OBSERVE	
METAL DECK INSPECTION <u>DURING</u> MECHANICAL FASTENING – VERIFY THE FOLLOWING ARE IN COMPLIANCE SDI QA/QC-2011, Appendix 1, Table 1.7		
TASK	INSPECTION TYPE <sup>1</sup>	DESCRIPTION
3. Fasteners are positioned as required	OBSERVE	
4. Fasteners are installed in accordance with manufacturer's instructions	OBSERVE	
METAL DECK INSPECTION <u>AFTER</u> MECHANICAL FASTENING – VERIFY THE FOLLOWING ARE IN COMPLIANCE SDI QA/QC-2011, Appendix 1, Table 1.8		
TASK	INSPECTION TYPE <sup>1</sup>	DESCRIPTION
5. Check spacing, type, and installation of support fasteners	<b>PERFORM</b>	
6. Check spacing, type, and installation of sidelap fasteners	<b>PERFORM</b>	
7. Check spacing, type, and installation of perimeter fasteners	<b>PERFORM</b>	
8. Verify repair activities	<b>PERFORM</b>	
9. Document acceptance or rejection of mechanical fasteners	<b>DOCUMENT</b>	

**END SECTION**

<sup>1</sup> **PERFORM:** Perform these tasks for each weld, fastener or bolted connection, and required verification.  
**OBSERVE:** Observe these items on a random sampling basis daily to insure that applicable requirements are met. Operations need not be delayed pending these inspections at contractor's risk.  
**DOCUMENT:** Document in a report that the work has been performed as required. This is in addition to all other required reports.

**J. STRUCTURAL - LIGHT GAUGE STEEL FRAMING AND/OR LIGHT GAUGE TRUSSES SECTION**

**THIS SECTION APPLICABLE IF BOX IS CHECKED:**

LIGHT GAUGE STEEL CONSTRUCTION AND CONNECTIONS – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC 1705.2.2, 1705.11.2, 1705.11.3, UFC 4 023 03		
TASK	INSPECTION TYPE <sup>1</sup>	DESCRIPTION
1. Trusses spanning 60-feet or greater where/if applies	<b>PERFORM</b>	Verify that temporary and permanent truss restraint/bracing is installed in accordance with approved truss submittal package.
2. Welded connections (seismic and/or wind resisting system)	OBSERVE	Visually inspect all welds composing part of the main wind or seismic force resisting system, including shearwalls, braces, collectors (drag struts), and hold-downs.
3. Connections (seismic and/or wind resisting system)	OBSERVE	Visually inspect all screw attachment, bolting, anchoring and other fastening of components within the main wind or seismic force resisting system, including roof deck, roof framing, exterior wall covering, wall to roof/floor connections, braces, collectors (drag struts) and hold-downs.
4. Cold-formed steel (progressive collapse resisting system where/if applies)	OBSERVE	Verify proper welding operations, screw attachment, bolting, anchoring and other fastening of components within the progressive collapse resisting system, including horizontal tie force elements, vertical tie force elements and bridging elements (UFC 4 023 03).

**END SECTION**

**K. STRUCTURAL - OPEN-WEB STEEL JOISTS SECTION**

**THIS SECTION APPLICABLE IF BOX IS CHECKED:**

OPEN-WEB STEEL JOISTS AND JOIST GIRDERS – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC TABLE 1705.2.3		
TASK	INSPECTION TYPE <sup>1</sup>	DESCRIPTION
1. Installation of open-web steel joists and joist girders	OBSERVE	<ul style="list-style-type: none"> <li>✓ End connections – welded or bolted</li> <li>✓ Bridging – horizontal and diagonal</li> </ul>

**END SECTION**

<sup>1</sup> **PERFORM:** Perform these tasks for each weld, fastener or bolted connection, and required verification.  
**OBSERVE:** Observe these items on a random sampling basis daily to insure that applicable requirements are met. Operations need not be delayed pending these inspections at contractor's risk.

**L. STRUCTURAL - CONCRETE CONSTRUCTION SECTION**  
**THIS SECTION APPLICABLE IF BOX IS CHECKED:**

CONCRETE CONSTRUCTION, INCLUDING COMPOSITE DECK – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC TABLE 1705.3 (ACI 318 REFERENCES NOTED IN IBC TABLE)		
TASK	INSPECTION TYPE <sup>1</sup>	DESCRIPTION
1. Inspect reinforcement, including prestressing tendons, and verify placement.	OBSERVE	Verify prior to placing concrete that reinforcing is of specified type, grade and size; that it is free of oil, dirt and unacceptable rust; that it is located and spaced properly; that hooks, bends, ties, stirrups and supplemental reinforcement are placed correctly; that lap lengths, stagger and offsets are provided; and that all mechanical connections are installed per the manufacturer's instructions and/or evaluation report.
2. Reinforcing bar welding	OBSERVE	✓ Verify weldability of reinforcing bars other than ASTM A 706 ✓ Inspect single-pass fillet welds, maximum 5/16" in accordance with AWS D1.4
3. All other welding	<b>CONTINUOUS</b>	Visually inspect all welds in accordance with AWS D1.4
4. Cast in place anchors and post installed drilled anchors (downward inclined)	OBSERVE	Verify prior to placing concrete that cast in place anchors and post installed drilled anchors have proper embedment, spacing and edge distance.
5. Post-installed adhesive anchors in horizontal or upward inclined orientations	<b>CONTINUOUS AND DOCUMENT</b>	✓ Inspect as required per approved ICC-ES report ✓ Verify that installer is certified for installation of horizontal and overhead installation applications ✓ Inspect proof loading as required by the contract documents
6. Verify use of required mix design	OBSERVE	Verify that all mixes used comply with the approved construction documents
7. Prior to concrete placement, fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete	<b>CONTINUOUS</b>	At the time fresh concrete is sampled to fabricate specimens for strength test verify these tests are performed by qualified technicians.
8. Inspect concrete and/or shotcrete placement for proper application techniques	<b>CONTINUOUS</b>	Verify proper application techniques are used during concrete conveyance and depositing avoids segregation or contamination. Verify that concrete is properly consolidated.
9. Verify maintenance of specified	OBSERVE	Inspect curing, cold weather protection, and hot weather protection procedures.

<sup>1</sup> **OBSERVE:** Observe these items on a random sampling basis daily to insure that applicable requirements are met. Operations need not be delayed pending these inspections at contractor's risk.

**DOCUMENT:** Document in a report that the work has been performed as required. This is in addition to all other required reports.

**CONTINUOUS:** Constant monitoring of identified tasks by a special inspector over the duration of performance of said tasks.

curing temperature and technique		
10. Pre-stressed concrete	<b>CONTINUOUS</b>	Verify application of prestressing forces and grouting of bonded prestressing tendons.

**CONTINUED ON FOLLOWING PAGE**

**K. STRUCTURAL - CONCRETE CONSTRUCTION (CONTINUED)**

CONCRETE CONSTRUCTION, INCLUDING COMPOSITE DECK – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC TABLE 1705.3 (ACI 318 REFERENCES NOTED IN IBC TABLE)		
TASK	INSPECTION TYPE <sup>1</sup>	DESCRIPTION
11. Inspect erection of precast concrete members	OBSERVE	
12. Verify in-situ concrete strength, prior to stressing of tendons in post-tensioned concrete and prior to removal of shores and forms from beams and structural slabs.	OBSERVE	
13. Inspect formwork for shape, location and dimensions of the concrete member being formed.	OBSERVE	

**END SECTION**

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<sup>1</sup> **OBSERVE:** Observe these items on a random sampling basis daily to insure that applicable requirements are met. Operations need not be delayed pending these inspections at contractor's risk.  
**DOCUMENT:** Document in a report that the work has been performed as required. This is in addition to all other required reports.  
**CONTINUOUS:** Constant monitoring of identified tasks by a special inspector over the duration of performance of said tasks.

**M. STRUCTURAL - MASONRY CONSTRUCTION SECTION (ALL RISK CATEGORIES)**

**THIS SECTION APPLICABLE IF BOX IS CHECKED:**

MASONRY CONSTRUCTION – VERIFY THE FOLLOWING ARE IN COMPLIANCE <u>AT START OF CONSTRUCTION</u> IBC 1705.4 (ACI 530-13 TABLE 3.1.2 & 3.1.3)		
TASK	INSPECTION TYPE <sup>1</sup>	DESCRIPTION
1. Compliance with approved submittals prior to start	OBSERVE	
2. Proportions of site-mixed mortar.	OBSERVE	
3. Grade and type of reinforcement, anchor bolts, and prestressing tendons and anchorages	OBSERVE	
4. Prestressing technique	OBSERVE	
5. Properties of thin bed mortar for AAC masonry	OBSERVE	
MASONRY CONSTRUCTION – VERIFY THE FOLLOWING ARE IN COMPLIANCE <u>PRIOR TO GROUTING</u> IBC 1705.4 (ACI 530-13 TABLE 3.1.2 & 3.1.3)		
TASK	INSPECTION TYPE <sup>1</sup>	DESCRIPTION
6. Grout space	OBSERVE	
7. Proportions of site-prepared grout and prestressing grout for bonded tendons	OBSERVE	
8. Proportions of site-mixed grout and prestressing grout for bonded tendons	OBSERVE	
9. Placement of masonry units and mortar joints	OBSERVE	
10. Welding of reinforcement	<b>CONTINUOUS</b>	
MASONRY CONSTRUCTION – VERIFY THE FOLLOWING ARE IN COMPLIANCE <u>DURING CONSTRUCTION</u> IBC 1705.4 (ACI 530-13 TABLE 3.1.2 & 3.1.3)		
TASK	INSPECTION TYPE <sup>1</sup>	DESCRIPTION
11. Size and location of structural elements is in compliance	OBSERVE	
12. Preparation, construction, and protection of masonry during cold weather (temperature below 40°F (4.4°C) or hot weather (temp above 90°F (32.2°C))	OBSERVE	
13. Application and measurement of prestressing force	<b>CONTINUOUS</b>	
14. Placement of grout and prestressing grout for bonded tendons	<b>CONTINUOUS</b>	
15. Placement of AAC masonry units and construction of thin bed mortar joints	<b>CONTINUOUS</b>	Continuous for first 5000 square feet only (465 square meters).
16. Observe preparation of grout specimens, mortar specimens, and/or prisms	OBSERVE	
17. Type, size and placement of reinforcement, connectors, anchor bolts and prestressing tendons	OBSERVE	

<sup>1</sup> **OBSERVE:** Observe these items on a random sampling basis daily to insure that applicable requirements are met. Operations need not be delayed pending these inspections at contractor's risk.

**CONTINUOUS:** Constant monitoring of identified tasks by a special inspector over the duration of performance of said tasks.

and anchorages, including details of anchorage of masonry to structural members, frames, or other construction		
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**END SECTION**

**N. STRUCTURAL - WOOD CONSTRUCTION – SPECIALTY ITEMS SECTION**  
**THIS SECTION APPLICABLE IF BOX IS CHECKED:**

WOOD CONSTRUCTION – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC 1705.5		
TASK	INSPECTION TYPE <sup>1</sup>	DESCRIPTION
1. High-load diaphragms where applicable	OBSERVE	Verify thickness and grade of sheathing, size of framing members at panel edges, nail diameters and length, and the number of fastener lines and that fastener spacing is per approved contract documents.
2. Metal-plate connected wood trusses spanning 60 feet or greater	OBSERVE	Verify that the temporary installation restraint/bracing and the permanent individual truss member restraint/bracing are installed in accordance with the approved truss submittal package

**END SECTION**

**O. STRUCTURAL - WOOD CONSTRUCTION - SEISMIC & WIND SECTION**  
**THIS SECTION APPLICABLE IF BOX IS CHECKED:**

WOOD CONSTRUCTION SEISMIC AND WIND – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC 1705.5		
TASK	INSPECTION TYPE <sup>1</sup>	DESCRIPTION
1. Nailing, bolting, anchoring and other fastening of elements of the main wind/seismic force-resisting system	OBSERVE	Includes connectors for: shearwall sheathing, roof/floor sheathing, drag struts/collectors, braces, hold downs, roof and floor framing connections to exterior walls.

**END SECTION**

**P. STRUCTURAL – ISOLATION AND ENERGY DISSIPATION SYSTEMS SECTION**  
**THIS SECTION APPLICABLE IF BOX IS CHECKED:**

ISOLATION AND ENERGY DISSIPATION SYSTEMS – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC TABLE 1705.2.3		
TASK	INSPECTION TYPE <sup>1</sup>	DESCRIPTION
1. Fabrication and installation	OBSERVE	Verify that fabrication and installation of isolator units and energy dissipation devices conform to manufacturer’s recommendations and approved construction documents

**END SECTION**

<sup>1</sup> **OBSERVE:** Observe these items on a random sampling basis daily to insure that applicable requirements are met. Operations need not be delayed pending these inspections at contractor’s risk.

**Q. GEOTECHNICAL - SOILS INSPECTION SECTION**  
**THIS SECTION APPLICABLE IF BOX IS CHECKED:**

SOILS INSPECTION – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC 1705.6		
TASK	INSPECTION TYPE <sup>1</sup>	DESCRIPTION
1. Materials below shallow foundations are adequate to achieve the design bearing capacity.	OBSERVE	
2. Excavations are extended to proper depth and have reached proper material	OBSERVE	
3. Verify use of proper materials, densities and lift thicknesses during placement and compaction of compacted fill	<b>CONTINUOUS</b>	
4. Prior to placement of compacted fill, inspect subgrade and verify that site has been prepared properly.	OBSERVE	During fill placement, the special inspector shall verify that proper materials and procedures are used in accordance with the provisions of the approved geotechnical report

**END SECTION**

**R. GEOTECHNICAL - DRIVEN DEEP FOUNDATION ELEMENTS SECTION**  
**THIS SECTION APPLICABLE IF BOX IS CHECKED:**

DEEP DRIVEN FOUNDATION CONSTRUCTION – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC 1705.5		
TASK	INSPECTION TYPE <sup>1</sup>	DESCRIPTION
1. Verify element materials, sizes and lengths comply with requirements	<b>CONTINUOUS</b>	
2. Inspect driving operations and maintain complete and accurate records for each element	<b>CONTINUOUS</b>	
3. Verify placement locations and plumbness, confirm type and size of hammer, record number of blows per foot of penetration, determine required penetrations to achieve design capacity, record tip and butt elevations and document any damage to foundation element	<b>CONTINUOUS</b>	

**END SECTION**

<sup>1</sup> **OBSERVE:** Observe these items on a random sampling basis daily to insure that applicable requirements are met. Operations need not be delayed pending these inspections at contractor's risk.

**CONTINUOUS:** Constant monitoring of identified tasks by a special inspector over the duration of performance of said tasks.

**S. GEOTECHNICAL - HELICAL PILE FOUNDATIONS SECTION**  
**THIS SECTION APPLICABLE IF BOX IS CHECKED:**

HELICAL PILE FOUNDATIONS – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC 1705.9		
TASK	INSPECTION TYPE <sup>1</sup>	DESCRIPTION
1. Record installation equipment used, pile dimensions, tip elevations, final depth, final installation torque and other pertinent installation data. The approved geotechnical report and the contract documents shall be used to determine compliance	<b>CONTINUOUS</b>	

**END SECTION**

**T. GEOTECHNICAL - CAST IN PLACE DEEP FOUNDATION ELEMENTS SECTION**  
**THIS SECTION APPLICABLE IF BOX IS CHECKED:**

CAST IN PLACE DEEP FOUNDATION ELEMENTS – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC 1705.8		
TASK	INSPECTION TYPE <sup>1</sup>	DESCRIPTION
1. Inspect drilling operations and maintain complete and accurate records for each element.	<b>CONTINUOUS</b>	
2. Verify placement locations and plumbness, confirm element diameters, bell diameters (if applicable), lengths, embedment into bedrock (if applicable and adequate end-bearing strata capacity. Record concrete or grout volumes	<b>CONTINUOUS</b>	

**END SECTION**

<sup>1</sup> **CONTINUOUS:** Constant monitoring of identified tasks by a special inspector over the duration of performance of said tasks.

**U. FIRE PROTECTION - SPRAYED FIRE-RESISTANT MATERIALS SECTION**  
**THIS SECTION APPLICABLE IF BOX IS CHECKED:**

SPRAYED FIRE RESISTANT MATERIALS – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC 1705.14		
TASK	INSPECTION TYPE <sup>1</sup>	DESCRIPTION
1. Surface condition	OBSERVE	Prior to application confirm that surface has been prepared per the approved fire-resistance design and manufacturer’s instructions.
2. Application	OBSERVE	Prior to application confirm that the substrate meets the minimum ambient temperature per the approved fire-resistance design and manufacturer’s instructions.
3. Material thickness	OBSERVE	Verify that the thickness of the SFRM to structural elements is not less than the thickness require by the fire-resistant design in more that 10 percent of the measurement, but in no case less than minimum allowable thickness required by 1705.14.
4. Material density	OBSERVE	Verify that the thickness of the SFRM to structural elements is not less than the thickness require by the fire-resistant design in more than 10 percent of the measurement, but in no case less than minimum allowable thickness required by IBC 1705.14.5
5. Bond strength	OBSERVE	Verify cohesive/adhesive bond strength of the cured SFRM applied to the structural element is not less than 150psf and according to IBC 1705.14.6

**END SECTION**

**V. FIRE PROTECTION - MASTIC AND INTUMESCENT COATINGS SECTION**  
**THIS SECTION APPLICABLE IF BOX IS CHECKED:**

MASTIC AND INTUMESCENT FIRE-RESISTANT COATINGS – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC 1705.15		
TASK	INSPECTION TYPE <sup>1</sup>	DESCRIPTION
1. Surface preparation	OBSERVE	Inspections shall be performed in accordance with AWCI 12-B and the contract documents

**END SECTION**

**W. FIRE PROTECTION – FIRE RESISTANT PENETRATIONS AND JOINTS SECTION**  
**THIS SECTION APPLICABLE IF BOX IS CHECKED:**

FIRE RESISTANT PENETRATIONS AND JOINTS – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC 1705.17		
TASK	INSPECTION TYPE <sup>1</sup>	DESCRIPTION
1. Inspections of penetration firestop systems conducted in accordance	OBSERVE	

<sup>1</sup> **OBSERVE:** Observe these items on a random sampling basis daily to insure that applicable requirements are met. Operations need not be delayed pending these inspections at contractor’s risk.

with ASTM E 2174.		
2. Inspections of fire-resistant joint systems conducted in accordance with ASTM E 2393	OBSERVE	

**END SECTION**

**X. FIRE PROTECTION – SMOKE CONTROL SECTION**  
**THIS SECTION APPLICABLE IF BOX IS CHECKED:**

SMOKE CONTROL – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC 1705.17		
TASK	INSPECTION TYPE <sup>1</sup>	DESCRIPTION
1. Verify device locations and perform leakage testing	OBSERVE	Perform during erection of ductwork and prior to concealment
2. Pressure difference testing, flow measurements and detection and control verification	OBSERVE	Perform prior to occupancy and after sufficient completion

**END SECTION**

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<sup>1</sup> **OBSERVE:** Observe these items on a random sampling basis daily to insure that applicable requirements are met. Operations need not be delayed pending these inspections at contractor's risk.

**Y. ARCHITECTURAL - EXTERIOR INSULATION AND FINISH SYSTEMS SECTION**  
**THIS SECTION APPLICABLE IF BOX IS CHECKED:**

EXTERIOR INSULATION AND FINISH SYSTEMS (EIFS) – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC 1705.16		
TASK	INSPECTION TYPE <sup>1</sup>	DESCRIPTION
1. Water resistive barrier coating applied over a sheathing substrate.	OBSERVE	Verify that water resistive barrier coating complies with ASTM E 2570.

**END SECTION**

**Z. ARCHITECTURAL – ARCHITECTURAL COMPONENTS**  
**THIS SECTION APPLICABLE IF BOX IS CHECKED:**

ARCHITECTURAL COMPONENTS – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC 1705.12.5, 1705.12.7		
TASK	INSPECTION TYPE <sup>1</sup>	DESCRIPTION
1. Erection and fastening of exterior cladding and interior and exterior veneer.	OBSERVE	Verify appropriate materials, fasteners and attachment at commencement of work and at completion. <b>Inspector Note: Inspection not required if height is less than 30 feet or weight is less than 5psf</b>
2. Interior and exterior non-load bearing walls	OBSERVE	Verify appropriate materials, fasteners and attachment at commencement of work and at completion. <b>Inspector Note: Inspection not required if height is less than 30 feet. Also, interior non-load bearing walls need not be inspected if weighing less than 15psf</b>
3. Access floors	OBSERVE	Verify that anchorage complies with approved construction documents. Inspection of post-installed anchors shall comply with approved ICC-ES report
4. Storage racks	OBSERVE	Verify that anchorage complies with approved construction documents. Inspection of post-installed anchors shall comply with approved ICC-ES report. <b>Inspector Note: Not required for racks less than 8 feet in height</b>

**END SECTION**

<sup>1</sup> **OBSERVE:** Observe these items on a random sampling basis daily to insure that applicable requirements are met. Operations need not be delayed pending these inspections at contractor's risk.

**AA. PLUMBING/MECHANICAL/ELECTRICAL DESIGNATED SEISMIC SYSTEMS SECTION**

**THIS SECTION APPLICABLE IF BOX IS CHECKED:**

PLUMBING, MECHANICAL AND ELECTRICAL - DESIGNATED SEISMIC SYSTEMS IBC 1705.12.4		
TASK	INSPECTION TYPE <sup>1</sup>	DESCRIPTION
1. Designated Seismic Systems equipment verification	OBSERVE	<ul style="list-style-type: none"> <li>✓ Verify model number and serial number are in conformance with project specific seismic qualification (PSSQ)</li> <li>✓ Verify Tag ID is correct and installed per specifications</li> </ul>
2. Designated Seismic Systems equipment Mounting	OBSERVE	<ul style="list-style-type: none"> <li>✓ Verify that Anchor Base Bolting is installed per PSSQ</li> <li>✓ Verify that Equipment Bracing is Installed per PSSQ</li> <li>✓ Verify that Bracing Attachments are installed per PSSQ</li> </ul>
3. Designated Seismic Systems utility Conduit/Piping	OBSERVE	<ul style="list-style-type: none"> <li>✓ Verify that Conduit/Piping is connected to the equipment per PSSQ (flex or rigid)</li> <li>✓ Verify that Conduit/Piping is seismically supported independently of equipment and in accordance with PSSQ support requirements</li> </ul>
4. Designated Seismic Systems clearance	OBSERVE	<ul style="list-style-type: none"> <li>✓ Adjacent Equipment – Verify that there is adequate gap to eliminate possibility of pounding</li> <li>✓ Conduit/Piping - Verify that there is adequate gap to eliminate possibility of pounding</li> </ul>

**END SECTION**

<sup>1</sup> **OBSERVE:** Observe these items on a random sampling basis daily to insure that applicable requirements are met. Operations need not be delayed pending these inspections at contractor's risk.

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Project: Hudson Valley Health Care System - New Community Living Center  
 Location: Montrose, NY  
 Project #: 620-334  
 Date: 7/21/2021

## **STATEMENT OF SPECIAL INSPECTIONS**

Project Seismic Design Category: B  
 Project Risk Category: III  
 Project Design Wind Speed (mph): 122  
 Number of Stories: 2  
 Structure Height Above Grade (ft): 39.41667  
 Hazardous Occupancy or attached to such? No Group H Occupancies (2018 IBC, Section 415)

### **Special Inspector of Record (SIOR)**

A Special Inspector of Record (SIOR) \_\_\_\_\_ **IS** \_\_\_\_\_ required (per UFGS 01 45 35, Section 1.3.8)

SIOR Name (Registered Professional): John Doe P.E.  
 Professional Registration Number: C222222  
 Consulting Firm Name (if any): ABC Structural Consulting  
 SIOR Office AND Mobile Phone Number: 1234567895 (Mobile), 123456789 (Office)

### **Lateral Force Resisting System (LFRS)**

2018 IBC 1704.3.2 and 1704.3.3

Following is a listing of critical main wind/seismic force resisting systems for this structure. Carefully inspect these elements as part of the roles and responsibilities of the Special Inspector (reference the Schedule of Special Inspections for inspection checklists).

<b>Vertical LFRS Elements</b>	<b>Notes</b>
Ordinary Concentric Braced Frames	At plan North Wall Wayl Along Col H-H & I-I
Ordinary Steel Moment resisting Frames (SMRF)	Both orthogonal Directions Building and canopies, See plans for call outs
Light Gauge Flat Strap X Bracing	Refer to plans for locations; and Sch. on S-501; GC shall provide final light gauge shop drawings to SIOR to inspect light gauge shear walls
Shear Wall Hold Downs	Identified on Plan & in Detail Sheet S-501
<b>Horizontal LFRS Elements</b>	<b>Notes</b>
Continuous Roof Ties	See Key Notes on Roof Plan
Collector Elements	Identified on plan with key notes
Concrete over metal deck	Penthouse level
Metal Roof Deck & Related Fastening System	See High and Low Roof Plans
Out of Plane Wall Connections	See Structural Details 1/S-304 and 2/S-307 and light gauge shop drawings
Diaphragm Cross Bracing	See Roof Plan for locations between cols. 3 - 4 & 12-14
Cast in Place Concrete Floor and Roof Diaphragms	N/A
Special Force Transfer Connection	N/A

Project: Hudson Valley Health Care System - New Community Living  
 Location: Montrose, NY  
 Project #: 620-334  
 Date: 7/21/2021

**Designated Seismic Systems (DSS)**

(2015 IBC 1705.13.3.4) (ASCE 7-10, 13.2.2, C13.2.2) (UFC 3-310-04, 2-11.2 & 2-13.2.2)

DESIGNATED SEISMIC SYSTEMS DO NOT APPLY TO THIS PROJECT, due to the Seismic Design Category being less than C.

**ELECTRICAL Designated Seismic Systems (DSS) Requiring a Certificate of Compliance**

1.	DSS Emergency or Standby Power System
2.	DSS Component XX
3.	DSS Component XX
4.	DSS Component XX
5.	DSS Component XX

If additional space is required, append an additional sheet listing the remaining DSS

**MECHANICAL/PLUMBING Designated Seismic Systems (DSS) Requiring a Certificate of Compliance**

1.	DSS Gas lines and associated fittings, anchorage, & flexible Connections
2.	DSS Component XX
3.	DSS Component XX
4.	DSS Component XX
5.	DSS Component XX
6.	DSS Component XX

If additional space is required, append an additional sheet listing the remaining DSS

**OTHER Designated Seismic Systems (DSS) Requiring a Certificate of Compliance**

1.	DSS Building egress stair systems
2.	DSS Building fire sprinkler systems
3.	DSS Component XX
4.	DSS Component XX
5.	DSS Component XX
6.	DSS Component XX

**Final Walk Down Inspection and Report**

(UFC 3 301 01 SECTION 2-2.4.3)

Designated Seismic Systems shall receive a final walk-down inspection by the Registered Design Professional in Responsible Charge

Final Walk Down Report, Prepared by the Registered Design Professional in Responsible Charge, Must Include:

1. Record observations of Final Walk Down Inspection
2. Document that Inspections were performed in accordance with the Schedule of Special Inspections
3. Document that all Designated Seismic Systems are installed according to construction/manufacture document requirements, and that Compliance Certificates have been collected (UFC 03 301 01, 2-13.2.2.1).

**SECTION 01 57 19**

**TEMPORARY ENVIRONMENTAL CONTROLS**

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

- A. This section specifies the control of environmental pollution and damage that the Contractor must consider for air, water, and land resources. It includes management of visual aesthetics, noise, solid waste, radiant energy, and radioactive materials, as well as other pollutants and resources encountered or generated by the Contractor. The Contractor is obligated to consider specified control measures with the costs included within the various contract items of work.
- B. Environmental pollution and damage is defined as the presence of chemical, physical, or biological elements or agents which:
  - 1. Adversely effect human health or welfare,
  - 2. Unfavorably alter ecological balances of importance to human life,
  - 3. Effect other species of importance to humankind, or;
  - 4. Degrade the utility of the environment for aesthetic, cultural, and historical purposes.
- C. Definitions of Pollutants:
  - 1. Chemical Waste: Petroleum products, bituminous materials, salts, acids, alkalis, herbicides, pesticides, organic chemicals, and inorganic wastes.
  - 2. Debris: Combustible and noncombustible wastes, such as leaves, tree trimmings, ashes, and waste materials resulting from construction or maintenance and repair work.
  - 3. Sediment: Soil and other debris that has been eroded and transported by runoff water.
  - 4. Solid Waste: Rubbish, debris, garbage, and other discarded solid materials resulting from industrial, commercial, and agricultural operations and from community activities.
  - 5. 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 "water of the United States" and would require a permit to discharge water from the governing agency.
  - 6. Rubbish: Combustible and noncombustible wastes such as paper, boxes, glass and crockery, metal and lumber scrap, tin cans, and bones.
  - 7. Sanitary Wastes:
    - a. Sewage: Domestic sanitary sewage and human and animal waste.
    - b. Garbage: Refuse and scraps resulting from preparation, cooking, dispensing, and consumption of food.

**1.2 QUALITY CONTROL**

- A. Establish and maintain quality control for the environmental protection of all items set forth herein.
- B. Record on daily reports any problems in complying with laws, regulations, and ordinances. Note any corrective action taken.

**1.3 REFERENCES**

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.
- B. U.S. National Archives and Records Administration (NARA):  
33 CFR 328 ..... Definitions

#### 1.4 SUBMITTALS

- A. In accordance with Section, 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES, furnish the following:
1. Environmental Protection Plan: After the contract is awarded and prior to the commencement of the work, the Contractor shall meet with the Resident Engineer to discuss the proposed Environmental Protection Plan and to develop mutual understanding relative to details of environmental protection. Not more than 20 days after the meeting, the Contractor shall prepare and submit to the COR and the Contracting Officer for approval, a written and/or graphic Environmental Protection Plan including, but not limited to, the following:
    - a. Name(s) of person(s) within the Contractor's organization who is (are) responsible for ensuring adherence to the Environmental Protection Plan.
    - b. Name(s) and qualifications of person(s) responsible for manifesting hazardous waste to be removed from the site.
    - c. Name(s) and qualifications of person(s) responsible for training the Contractor's environmental protection personnel.
    - d. Description of the Contractor's environmental protection personnel training program.
    - e. A list of Federal, State, and local laws, regulations, and permits concerning environmental protection, pollution control, noise control and abatement that are applicable to the Contractor's proposed operations and the requirements imposed by those laws, regulations, and permits.
    - f. Methods for protection of features to be preserved within authorized work areas including trees, shrubs, vines, grasses, ground cover, landscape features, air and water quality, fish and wildlife, soil, historical, and archeological and cultural resources.
    - g. Procedures to provide the environmental protection that comply with the applicable laws and regulations. Describe the procedures to correct pollution of the environment due to accident, natural causes, or failure to follow the procedures as described in the Environmental Protection Plan.
    - h. Permits, licenses, and the location of the solid waste disposal area.
    - i. Drawings showing locations of any proposed temporary excavations or embankments for haul roads, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials. Include as part of an Erosion Control Plan approved by the District Office of the U.S. Soil Conservation Service and the Department of Veterans Affairs.
    - j. Environmental Monitoring Plans for the job site including land, water, air, and noise.
    - k. Work Area Plan showing the proposed activity in each portion of the area and identifying the areas of limited use or nonuse. Plan should include measures for marking the limits of use areas. This plan may be incorporated within the Erosion Control Plan.
- B. Approval of the Contractor's Environmental Protection Plan will not relieve the Contractor of responsibility for adequate and continued control of pollutants and other environmental protection measures.

#### 1.5 PROTECTION OF ENVIRONMENTAL RESOURCES

- A. Protect environmental resources within the project boundaries and those affected outside the limits of permanent work during the entire period of this contract. Confine activities to areas defined by the specifications and drawings.
- B. Protection of Land Resources: Prior to construction, identify all land resources to be preserved within the work area. Do not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, top soil, and land forms without permission from the Resident

Temporary Environmental Controls

Engineer. Do not fasten or attach ropes, cables, or guys to trees for anchorage unless specifically authorized, or where special emergency use is permitted.

1. Work Area Limits: Prior to any construction, mark the areas that require work to be performed under this contract. Mark or fence isolated areas within the general work area that are to be saved and protected. Protect monuments, works of art, and markers before construction operations begin. Convey to all personnel the purpose of marking and protecting all necessary objects.
2. Protection of Landscape: Protect trees, shrubs, vines, grasses, land forms, and other landscape features shown on the drawings to be preserved by marking, fencing, or using any other approved techniques.
  - a. Box and protect from damage existing trees and shrubs to remain on the construction site.
  - b. Immediately repair all damage to existing trees and shrubs by trimming, cleaning, and painting with antiseptic tree paint.
  - c. Do not store building materials or perform construction activities closer to existing trees or shrubs than the farthest extension of their limbs.
3. Reduction of Exposure of Unprotected Erodible Soils: Plan and conduct earthwork to minimize the duration of exposure of unprotected soils. Clear areas in reasonably sized increments only as needed to use. Form earthwork to final grade as shown. Immediately protect side slopes and back slopes upon completion of rough grading.
4. Temporary Protection of Disturbed Areas: Construct diversion ditches, benches, and berms to retard and divert runoff from the construction site to protected drainage areas approved under paragraph 208 of the Clean Water Act.
  - a. Sediment Basins: Trap sediment from construction areas in temporary or permanent sediment basins that accommodate the runoff of a local 10 (design year) storm. After each storm, pump the basins dry and remove the accumulated sediment. Control overflow/drainage with paved weirs or by vertical overflow pipes, draining from the surface.
  - b. Reuse or conserve the collected topsoil sediment as directed by the Resident Engineer. Topsoil use and requirements are specified in Section 31 20 00, EARTH MOVING.
  - c. Institute effluent quality monitoring programs as required by Federal, State, and local environmental agencies.
5. Erosion and Sedimentation Control Devices: The erosion and sediment controls selected and maintained by the Contractor shall be such that water quality standards are not violated as a result of the Contractor's activities. Construct or install all temporary and permanent erosion and sedimentation control features shown.. Maintain temporary erosion and sediment control measures such as berms, dikes, drains, sedimentation basins, grassing, and mulching, until permanent drainage and erosion control facilities are completed and operative.
6. Manage borrow areas on and off Government property to minimize erosion and to prevent sediment from entering nearby water courses or lakes.
7. Manage and control spoil areas on and off Government property to limit spoil to areas shown and prevent erosion of soil or sediment from entering nearby water courses or lakes.
8. Protect adjacent areas from despoilment by temporary excavations and embankments.
9. Handle and dispose of solid wastes in such a manner that will prevent contamination of the environment. Place solid wastes (excluding clearing debris) in containers that are emptied on a regular schedule. Transport all solid waste off Government property and dispose of waste in compliance with Federal, State, and local requirements.
10. Store chemical waste away from the work areas in corrosion resistant containers and dispose of waste in accordance with Federal, State, and local regulations.
11. Handle discarded materials other than those included in the solid waste category as directed by the Resident Engineer.

- C. Protection of Water Resources: Keep construction activities under surveillance, management, and control to avoid pollution of surface and ground waters and sewer systems. Implement management techniques to control water pollution by the listed construction activities that are included in this contract.
  - 1. Washing and Curing Water: Do not allow wastewater directly derived from construction activities to enter water areas. Collect and place wastewater in retention ponds allowing the suspended material to settle, the pollutants to separate, or the water to evaporate.
  - 2. Control movement of materials and equipment at stream crossings during construction to prevent violation of water pollution control standards of the Federal, State, or local government.
  - 3. Monitor water areas affected by construction.
- D. Protection of Fish and Wildlife Resources: Keep construction activities under surveillance, management, and control to minimize interference with, disturbance of, or damage to fish and wildlife. Prior to beginning construction operations, list species that require specific attention along with measures for their protection.
- E. Protection of Air Resources: Keep construction activities under surveillance, management, and control to minimize pollution of air resources. Burning is not permitted on the job site. Keep activities, equipment, processes, and work operated or performed, in strict accordance with the State of New York Environmental Conservation Law and Federal emission and performance laws and standards. Maintain ambient air quality standards set by the Environmental Protection Agency, for those construction operations and activities specified.
  - 1. Particulates: Control dust particles, aerosols, and gaseous by-products from all construction activities, processing, and preparation of materials (such as from asphaltic batch plants) at all times, including weekends, holidays, and hours when work is not in progress.
  - 2. Particulates Control: Maintain all excavations, stockpiles, haul roads, permanent and temporary access roads, plant sites, spoil areas, borrow areas, and all other work areas within or outside the project boundaries free from particulates which would cause a hazard or a nuisance. Sprinklering, chemical treatment of an approved type, light bituminous treatment, baghouse, scrubbers, electrostatic precipitators, or other methods are permitted to control particulates in the work area.
  - 3. Hydrocarbons and Carbon Monoxide: Control monoxide emissions from equipment to Federal and State allowable limits.
  - 4. Odors: Control odors of construction activities and prevent obnoxious odors from occurring.
- F. Reduction of Noise: Minimize noise using every action possible. Perform noise-producing work in less sensitive hours of the day or week as directed by the Resident Engineer. Maintain noise-produced work at or below the decibel levels and within the time periods specified.
  - 1. Perform construction activities involving repetitive, high-level impact noise only between 8:00 a.m. and 6:00p.m unless otherwise permitted by local ordinance or the Resident Engineer. Repetitive impact noise on the property shall not exceed the following dB limitations:

Time Duration of Impact Noise	Sound Level in dB
More than 12 minutes in any hour	70
Less than 30 seconds of any hour	85
Less than three minutes of any hour	80
Less than 12 minutes of any hour	75

2. Provide sound-deadening devices on equipment and take noise abatement measures that are necessary to comply with the requirements of this contract, consisting of, but not limited to, the following:

- a. Maintain maximum permissible construction equipment noise levels at 15 m (50 feet) (dBA):

EARTHMOVING		MATERIALS HANDLING	
FRONT LOADERS	75	CONCRETE MIXERS	75
BACKHOES	75	CONCRETE PUMPS	75
DOZERS	75	CRANES	75
TRACTORS	75	DERRICKS IMPACT	75
SCAPERS	80	PILE DRIVERS	95
GRADERS	75	JACK HAMMERS	75
TRUCKS	75	ROCK DRILLS	80
PAVERS, STATIONARY	80	PNEUMATIC TOOLS	80
PUMPS	75	BLASTING	N/A
GENERATORS	75	SAWS	75
COMPRESSORS	75	VIBRATORS	75

- b. Use shields or other physical barriers to restrict noise transmission.  
 c. Provide soundproof housings or enclosures for noise-producing machinery.  
 d. Use efficient silencers on equipment air intakes.  
 e. Use efficient intake and exhaust mufflers on internal combustion engines that are maintained so equipment performs below noise levels specified.  
 f. Line hoppers and storage bins with sound deadening material.  
 g. Conduct truck loading, unloading, and hauling operations so that noise is kept to a minimum.
3. Measure sound level for noise exposure due to the construction at least once every five successive working days while work is being performed above 55 dB(A) noise level. Measure noise exposure at the property line or 15 m (50 feet) from the noise source, whichever is greater. Measure the sound levels on the A weighing network of a General Purpose sound level meter at slow response. To minimize the effect of reflective sound waves at buildings, take measurements at 900 to 1800 mm (three to six feet) in front of any building face. Submit the recorded information to the Resident Engineer noting any problems and the alternatives for mitigating actions.
- G. Restoration of Damaged Property: If any direct or indirect damage is done to public or private property resulting from any act, omission, neglect, or misconduct, the Contractor shall restore the damaged property to a condition equal to that existing before the damage at no additional cost to the Government. Repair, rebuild, or restore property as directed or make good such damage in an acceptable manner.
- H. Final Clean-up: On completion of project and after removal of all debris, rubbish, and temporary construction, Contractor shall leave the construction area in a clean condition satisfactory to the Resident Engineer. Cleaning shall include off the station disposal of all items and materials not required to be salvaged, as well as all debris and rubbish resulting from demolition and new work operations.

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## SECTION 01 58 16

### TEMPORARY INTERIOR SIGNAGE

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. This section specifies temporary interior signs.

#### PART 2 - PRODUCTS

##### 2.1 TEMPORARY SIGNS

- A. Fabricate from 50 Kg (110 pound) mat finish white paper.
- B. Cut to 100 mm (4-inch) wide by 300 mm (12 inch) long size tag.
- C. Punch 3 mm (1/8-inch) diameter hole centered on 100 mm (4-inch) dimension of tag. Edge of Hole spaced approximately 13 mm (1/2-inch) from one end on tag.
- D. Reinforce hole on both sides with gummed cloth washer or other suitable material capable of preventing tie pulling through paper edge.
- E. Ties: Steel wire 0.3 mm (0.0120-inch) thick, attach to tag with twist tie, leaving 150 mm (6-inch) long free ends.

#### PART 3 - EXECUTION

##### 3.1 INSTALLATION

- A. Install temporary signs attached to room door frame or room door knob, lever, or pull for doors on corridor openings.
- B. Mark on signs with felt tip marker having approximately 3 mm (1/8-inch) wide stroke for clearly legible numbers or letters.
- C. Identify room with numbers as designated on floor plans.

##### 3.2 LOCATION

- A. Install on doors that have room, corridor, and space numbers shown.
- B. Doors that do not require signs are as follows:
  - 1. Corridor barrier doors (cross-corridor) in corridor with same number.
  - 2. Folding doors or partitions.
  - 3. Toilet or bathroom doors within and between rooms.
  - 4. Communicating doors in partitions between rooms with corridor entrance doors.
  - 5. Closet doors within rooms.
- C. Replace missing, damaged, or illegible signs.

--- E N D ---

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## SECTION 01 74 19

### CONSTRUCTION WASTE MANAGEMENT

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. This section specifies the requirements for the management of non-hazardous building construction and demolition waste.
- B. Waste disposal in landfills shall be minimized to the greatest extent possible. Of the inevitable waste that is generated, as much of the waste material as economically feasible shall be salvaged, recycled or reused.
- C. Contractor shall use all reasonable means to divert construction and demolition waste from landfills and incinerators, and facilitate their salvage and recycle not limited to the following:
  - 1. Waste Management Plan development and implementation.
  - 2. Techniques to minimize waste generation.
  - 3. Sorting and separating of waste materials.
  - 4. Salvage of existing materials and items for reuse or resale.
  - 5. Recycling of materials that cannot be reused or sold.
- D. At a minimum the following waste categories shall be diverted from landfills:
  - 1. Soil.
  - 2. Inerts (eg, concrete, masonry and asphalt).
  - 3. Clean dimensional wood and palette wood.
  - 4. Green waste (biodegradable landscaping materials).
  - 5. Engineered wood products (plywood, particle board and I-joists, etc).
  - 6. Metal products (eg, steel, wire, beverage containers, copper, etc).
  - 7. Cardboard, paper and packaging.
  - 8. Bitumen roofing materials.
  - 9. Plastics (eg, ABS, PVC).
  - 10. Carpet and/or pad.
  - 11. Gypsum board.
  - 12. Insulation.
  - 13. Paint.
  - 14. Fluorescent lamps.

##### 1.2 RELATED WORK

- A. Section 02 41 00, DEMOLITION.
- B. Section 01 00 00, GENERAL REQUIREMENTS.

##### 1.3 QUALITY ASSURANCE

- A. Contractor shall practice efficient waste management when sizing, cutting and installing building products. Processes shall be employed to ensure the generation of as little waste as possible. Construction /Demolition waste includes products of the following:
  - 1. Excess or unusable construction materials.
  - 2. Packaging used for construction products.
  - 3. Poor planning and/or layout.
  - 4. Construction error.
  - 5. Over ordering.
  - 6. Weather damage.
  - 7. Contamination.

8. Mishandling.
  9. Breakage.
- B. Establish and maintain the management of non-hazardous building construction and demolition waste set forth herein. Conduct a site assessment to estimate the types of materials that will be generated by demolition and construction.
  - C. Contractor shall develop and implement procedures to recycle construction and demolition waste to a minimum of 50 percent.
  - D. Contractor shall be responsible for implementation of any special programs involving rebates or similar incentives related to recycling. Any revenues or savings obtained from salvage or recycling shall accrue to the contractor.
  - E. Contractor shall provide all demolition, removal and legal disposal of materials. Contractor shall ensure that facilities used for recycling, reuse and disposal shall be permitted for the intended use to the extent required by local, state, federal regulations. The Whole Building Design Guide website <http://www.wbdg.org/tools/cwm.php> provides a Construction Waste Management Database that contains information on companies that haul, collect, and process recyclable debris from construction projects.
  - F. Contractor shall assign a specific area to facilitate separation of materials for reuse, salvage, recycling, and return. Such areas are to be kept neat and clean and clearly marked in order to avoid contamination or mixing of materials.
  - G. Contractor shall provide on-site instructions and supervision of separation, handling, salvaging, recycling, reuse and return methods to be used by all parties during waste generating stages.
  - H. Record on daily reports any problems in complying with laws, regulations and ordinances with corrective action taken.

#### **1.4 TERMINOLOGY**

- A. Class III Landfill: A landfill that accepts non-hazardous resources such as household, commercial and industrial waste resulting from construction, remodeling, repair and demolition operations.
- B. Clean: Untreated and unpainted; uncontaminated with adhesives, oils, solvents, mastics and like products.
- C. Construction and Demolition Waste: Includes all non-hazardous resources resulting from construction, remodeling, alterations, repair and demolition operations.
- D. Dismantle: The process of parting out a building in such a way as to preserve the usefulness of its materials and components.
- E. Disposal: Acceptance of solid wastes at a legally operating facility for the purpose of land filling (includes Class III landfills and inert fills).
- F. Inert Backfill Site: A location, other than inert fill or other disposal facility, to which inert materials are taken for the purpose of filling an excavation, shoring or other soil engineering operation.
- G. Inert Fill: A facility that can legally accept inert waste, such as asphalt and concrete exclusively for the purpose of disposal.
- H. Inert Solids/Inert Waste: Non-liquid solid resources including, but not limited to, soil and concrete that does not contain hazardous waste or soluble pollutants at concentrations in excess of water-quality objectives established by a regional water board, and does not contain significant quantities of decomposable solid resources.
- I. Mixed Debris: Loads that include commingled recyclable and non-recyclable materials generated at the construction site.

- J. Mixed Debris Recycling Facility: A solid resource processing facility that accepts loads of mixed construction and demolition debris for the purpose of recovering re-usable and recyclable materials and disposing non-recyclable materials.
- K. Permitted Waste Hauler: A company that holds a valid permit to collect and transport solid wastes from individuals or businesses for the purpose of recycling or disposal.
- L. Recycling: The process of sorting, cleansing, treating, and reconstituting materials for the purpose of using the altered form in the manufacture of a new product. Recycling does not include burning, incinerating or thermally destroying solid waste.
  - 1. On-site Recycling – Materials that are sorted and processed on site for use in an altered state in the work, i.e. concrete crushed for use as a sub-base in paving.
  - 2. Off-site Recycling – Materials hauled to a location and used in an altered form in the manufacture of new products.
- M. Recycling Facility: An operation that can legally accept materials for the purpose of processing the materials into an altered form for the manufacture of new products. Depending on the types of materials accepted and operating procedures, a recycling facility may or may not be required to have a solid waste facilities permit or be regulated by the local enforcement agency.
- N. Reuse: Materials that are recovered for use in the same form, on-site or off-site.
- O. Return: To give back reusable items or unused products to vendors for credit.
- P. Salvage: To remove waste materials from the site for resale or re-use by a third party.
- Q. Source-Separated Materials: Materials that are sorted by type at the site for the purpose of reuse and recycling.
- R. Solid Waste: Materials that have been designated as non-recyclable and are discarded for the purposes of disposal.
- S. Transfer Station: A facility that can legally accept solid waste for the purpose of temporarily storing the materials for re-loading onto other trucks and transporting them to a landfill for disposal, or recovering some materials for re-use or recycling.

## 1.5 SUBMITTALS

- A. In accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, and SAMPLES, furnish the following:
- B. Prepare and submit to the Resident Engineer a written demolition debris management plan. The plan shall include, but not be limited to, the following information:
  - 1. Procedures to be used for debris management.
  - 2. Techniques to be used to minimize waste generation.
  - 3. Analysis of the estimated job site waste to be generated:
    - a. List of each material and quantity to be salvaged, reused, recycled.
    - b. List of each material and quantity proposed to be taken to a landfill.
  - 4. Detailed description of the Means/Methods to be used for material handling.
    - a. On site: Material separation, storage, protection where applicable.
    - b. Off site: Transportation means and destination. Include list of materials.
      - 1) Description of materials to be site-separated and self-hauled to designated facilities.
      - 2) Description of mixed materials to be collected by designated waste haulers and removed from the site.
    - c. The names and locations of mixed debris reuse and recycling facilities or sites.
    - d. The names and locations of trash disposal landfill facilities or sites.
    - e. Documentation that the facilities or sites are approved to receive the materials.
- C. Designated Manager responsible for instructing personnel, supervising, documenting and administer over meetings relevant to the Waste Management Plan.

- D. Monthly summary of construction and demolition debris diversion and disposal, quantifying all materials generated at the work site and disposed of or diverted from disposal through recycling.

#### **1.6 APPLICABLE PUBLICATIONS**

- A. Publications listed below form a part of this specification to the extent referenced. Publications are referenced by the basic designation only. In the event that criteria requirements conflict, the most stringent requirements shall be met.
- B. U.S. Green Building Council (USGBC):
- C. LEED Green Building Rating System for New Construction

#### **1.7 RECORDS**

- A. 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. Records shall be kept in accordance with the LEED Reference Guide and LEED Template.

### **PART 2 - PRODUCTS**

#### **2.1 MATERIALS**

- A. List of each material and quantity to be salvaged, recycled, reused.
- B. List of each material and quantity proposed to be taken to a landfill.
- C. Material tracking data: Receiving parties, dates removed, transportation costs, weight tickets, tipping fees, manifests, invoices, net total costs or savings.

### **PART 3 - EXECUTION**

#### **3.1 COLLECTION**

- A. Provide all necessary containers, bins and storage areas to facilitate effective waste management.
- B. Clearly identify containers, bins and storage areas so that recyclable materials are separated from trash and can be transported to respective recycling facility for processing.
- C. Hazardous wastes shall be separated, stored, disposed of according to local, state, federal regulations.

#### **3.2 DISPOSAL**

- A. Contractor shall be responsible for transporting and disposing of materials that cannot be delivered to a source-separated or mixed materials recycling facility to a transfer station or disposal facility that can accept the materials in accordance with state and federal regulations.
- B. Construction or demolition materials with no practical reuse or that cannot be salvaged or recycled shall be disposed of at a landfill or incinerator.

#### **3.3 REPORT**

- A. With each application for progress payment, submit a summary of construction and demolition debris diversion and disposal including beginning and ending dates of period covered.

- B. Quantify all materials diverted from landfill disposal through salvage or recycling during the period with the receiving parties, dates removed, transportation costs, weight tickets, manifests, invoices. Include the net total costs or savings for each salvaged or recycled material.
- C. Quantify all materials disposed of during the period with the receiving parties, dates removed, transportation costs, weight tickets, tipping fees, manifests, invoices. Include the net total costs for each disposal.

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## SECTION 01 81 13

### SUSTAINABLE CONSTRUCTION REQUIREMENTS

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. This Section describes general requirements and procedures to comply with federal mandates and U.S. Department of Veterans Affairs (VA) policies for sustainable construction.
- B. The Design Professional has selected materials and utilized integrated design processes that achieve the Government's objectives. Contractor is responsible to maintain and support these objectives in developing means and methods for performing work and in proposing product substitutions or changes to specified processes. Obtain approval from Contracting Officer for all changes and substitutions to materials or processes. Proposed changes must meet, or exceed, materials or processes specified.

##### 1.2 RELATED WORK

- A. Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS.
- B. Section 01 74 19 CONSTRUCTION WASTE MANAGEMENT.
- C. Section 01 91 00 GENERAL COMMISSIONING REQUIREMENTS.

##### 1.3 DEFINITIONS

- A. Recycled Content: Recycled content of materials is defined according to Federal Trade Commission Guides for the Use of Environmental Marketing Claims (16 CFR Part 260). Recycled content value of a material assembly is determined by weight. Recycled fraction of assembly is multiplied by cost of assembly to determine recycled content value.
  - 1. "Post-Consumer" material is defined as waste material generated by households or by commercial, industrial, and institutional facilities in their role as end users of the product, which can no longer be used for its intended purpose.
  - 2. "Pre-Consumer" material is defined as material diverted from waste stream during the manufacturing process. Excluded is reutilization of materials such as rework, regrind, or scrap generated in a process and capable of being reclaimed within the same process that generated it.
- B. Biobased Products: Biobased products are derived from plants and other renewable agricultural, marine, and forestry materials and provide an alternative to conventional petroleum derived products. Biobased products include diverse categories such as lubricants, cleaning products, inks, fertilizers, and bioplastics.
- C. Low Pollutant-Emitting Materials: Materials and products which are minimally odorous, irritating, or harmful to comfort and well-being of installers and occupants.
- D. Volatile Organic Compounds (VOC): Chemicals that are emitted as gases from certain solids or liquids. VOCs include a variety of chemicals, some of which may have short- and long-term adverse health effects.

##### 1.4 REFERENCE STANDARDS

- A. Carpet and Rug Institute Green Label Plus program.
- B. U.S. Department of Agriculture BioPreferred program (USDA BioPreferred).
- C. U.S. Environmental Protection Agency Comprehensive Procurement Guidelines (CPG).
- D. U.S. Environmental Protection Agency WaterSense Program (WaterSense).

- E. U.S. Environmental Protection Agency ENERGY STAR Program (ENERGY STAR).
- F. U. S. Department of Energy Federal Energy Management Program (FEMP).
- G. Green Electronic Council EPEAT Program (EPEAT).

## 1.5 SUBMITTALS

- A. All submittals to be provided by contractor to COR.
- B. Sustainability Action Plan:
  - 1. Submit documentation as required by this section; provide additional copies of typical submittals required under technical sections when sustainable construction requires copies of record submittals.
  - 2. Within 30 days after Preconstruction Meeting provide a narrative plan for complying with requirements stipulated within this section.
  - 3. Sustainability Action Plan must:
    - a. Make reference to sustainable construction submittals defined by this section.
    - b. Address all items listed under PERFORMANCE CRITERIA.
    - c. Indicate individual(s) responsible for implementing the plan.
- C. Low Pollutant-Emitting Materials Tracking Spreadsheet: Within 30 days after Preconstruction Meeting provide a preliminary Low Pollutant-Emitting Materials Tracking Spreadsheet. The Low Pollutant-Emitting Materials Tracking Spreadsheet must be an electronic file and include all materials on Project in categories described under Low Pollutant-Emitting Materials in 01 81 13.
- D. Construction Indoor Air Quality (IAQ) Management Plan:
  - 1. Not more than 30 days after Preconstruction Meeting provide a Construction IAQ Management Plan as an electronic file including descriptions of the following:
    - a. Instruction procedures for meeting or exceeding minimum requirements of ANSI/SMACNA 008-2008, Chapter 3, including procedures for HVAC Protection, Source Control, Pathway Interruption, Housekeeping, and Scheduling.
    - b. Instruction procedures for protecting absorptive materials stored on-site or installed from moisture damage.
    - c. Schedule of submission of photographs of on-site construction IAQ management measures such as protection of ducts and on-site stored oil installed absorptive materials.
    - d. Instruction procedures if air handlers must be used during construction, including a description of filtration media to be used at each return air grille.
    - e. Instruction procedure for replacing all air-filtration media immediately prior to occupancy after completion of construction, including a description of filtration media to be used at each air handling or air supply unit.
    - f. Instruction procedures and schedule for implementing building flush-out.
- E. Product Submittals:
  - 1. Recycled Content: Submit product data from manufacturer indicating percentages by weight of post-consumer and pre-consumer recycled content for products having recycled content (excluding MEP systems equipment and components).
  - 2. Biobased Content: Submit product data for products to be installed or used which are included in any of the USDA BioPreferred program's product categories. Data to include percentage of biobased content and source of biobased material.
  - 3. Low Pollutant-Emitting Materials: Submit product data confirming compliance with relevant requirements for all materials on Project in categories described under Low Pollutant-Emitting Materials in 01 81 13.
  - 4. For applicable products and equipment, submit product documentation confirming ENERGY STAR label, FEMP certification, WaterSense, and/or EPEAT certification.

- F. Sustainable Construction Progress Reports: Concurrent with each Application for Payment, submit a Sustainable Construction Progress Report to confirm adherence with Sustainability Action Plan.
1. Include narratives of revised strategies for bringing work progress into compliance with plan and product submittal data.
  2. Include updated and current Low Pollutant-Emitting Materials Tracking Spreadsheet.
  3. Include construction waste tracking, in tons or cubic yards, including waste description, whether diverted or landfilled, hauler, and percent diverted for comingled quantities; and excluding land-clearing debris and soil. Provide haul receipts and documentation of diverted percentages for comingled wastes.
- G. Closeout Submittals: Within 14 days after Substantial Completion provide the following:
1. Final version of Low Pollutant-Emitting Materials Tracking Spreadsheet.
  2. Manufacturer's cut sheets and product data highlighting the Minimum Efficiency Reporting Value (MERV) for filtration media installed at return air grilles during construction if permanently installed air handling units are used during construction.
  3. Manufacturer's cut sheets and product data highlighting the Minimum Efficiency Reporting Value (MERV) for final filtration media in air handling units.
  4. Minimum 18 construction photographs including six photographs taken on three different occasions during construction of ANSI/SMACNA 008-2008, Chapter 3 approaches employed, along with a brief description of each approach, documenting implementation of IAQ management measures, such as protection of ducts and on-site stored or installed absorptive materials.
  5. Flush-out Documentation:
    - a. Product data for filtration media used during flush-out.
    - b. Product data for filtration media installed immediately prior to occupancy.
    - c. Signed statement describing building air flush-out procedures including dates when flush-out was begun and completed and statement that filtration media was replaced after flush-out.

## 1.6 QUALITY ASSURANCE

- A. Preconstruction Meeting: After award of Contract and prior to commencement of Work, schedule and conduct meeting with COR/Resident Engineer and Architect to discuss the Project Sustainable Action Plan content as it applies to submittals, project delivery, required Construction Indoor Air Quality (IAQ) Management Plan, and other Sustainable Construction Requirements. The purpose of this meeting is to develop a mutual understanding of the Sustainable Construction Requirements and coordination of contractor's management of these requirements with the Contracting Officer and the Construction Quality Manager.
- B. Construction Job Conferences: Status of compliance with Sustainable Construction Requirements of these specifications will be an agenda item at regular job meetings conducted during the course of work at the site.

## 1.7 APPLICABLE PUBLICATIONS

- A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in text by basic designation only. Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified.
- B. Green Seal Standard GS-11, Paints, 1st Edition, May 20, 1993.
- C. Green Seal Standard GC-03, Anti-Corrosive Paints, 2nd Edition, January 7, 1997.
- D. Green Seal Standard GC-36, Commercial Adhesives, October 19, 2000.
- E. South Coast Air Quality Management District (SCAQMD) Rule 1113, Architectural Coatings, rules in effect on January 1, 2004.

- F. South Coast Air Quality Management District (SCAQMD) Rule 1168, July 1, 2005 and rule amendment date of January 7, 2005.
- G. Sheet Metal and Air Conditioning National Contractors' Association (SMACNA) IAQ Guidelines for Occupied Buildings under Construction, 2nd Edition (ANSI/SMACNA 008-2008), Chapter 3.
- H. 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, Emission Testing method for California Specification 01350 (CDPH Standard Method V1.1-2010).
- I. Federal Trade Commission Guides for the Use of Environmental Marketing Claims (16 CFR Part 260).
- J. ASHRAE Standard 52.2-2007.

## **PART 2 - PRODUCTS**

### **2.1 PERFORMANCE CRITERIA**

- A. Construction waste diversion from landfill disposal must comprise at least 50 percent of total construction waste, excluding land clearing debris and soil. Alternative daily cover (ADC) does not qualify as material diverted from disposal.
- B. Low Pollutant-Emitting Materials:
  - 1. Adhesives, sealants and sealant primers applied on site within the weatherproofing membrane must comply with VOC limits of SCAQMD Rule 1168:
    - a. Flooring Adhesives and Sealants:
      - 1) Indoor carpet adhesives: 50 g/L.
      - 2) Wood Flooring Adhesive: 100 g/L.
      - 3) Rubber Floor Adhesives: 60 g/L.
      - 4) Subfloor Adhesives: 50 g/L.
      - 5) Ceramic Tile Adhesives and Grout: 65 g/L.
      - 6) Cove Base Adhesives: 50 g/L.
      - 7) Multipurpose Construction Adhesives: 70 g/L.
      - 8) Porous Material (Except Wood) Substrate: 50 g/L.
      - 9) Wood Substrate: 30 g/L.
      - 10) Architectural Non-Porous Sealant Primer: 250 g/L.
      - 11) Architectural Porous Sealant Primer: 775 g/L.
      - 12) Other Sealant Primer: 750 g/L.
      - 13) Structural Wood Member Adhesive: 140 g/L.
      - 14) Sheet-Applied Rubber Lining Operations: 850 g/L.
      - 15) Top and Trim Adhesive: 250 g/L.
      - 16) Architectural Sealant: 250 g/L.
      - 17) Other Sealant: 420 g/L.
    - b. Non-Flooring Adhesives and Sealants:
      - 1) Drywall and Panel Adhesives: 50 g/L.
      - 2) Multipurpose Construction Adhesives: 70 g/L.
      - 3) Structural Glazing Adhesives: 100 g/L.
      - 4) Metal-to-Metal Substrate Adhesives: 30 g/L.
      - 5) Plastic Foam Substrate Adhesive: 50 g/L.
      - 6) Porous Material (Except Wood) Substrate Adhesive: 50 g/L.
      - 7) Wood Substrate Adhesive: 30 g/L.
      - 8) Fiberglass Substrate Adhesive: 80 g/L.
      - 9) Architectural Non-Porous Sealant Primer: 250 g/L.
      - 10) Architectural Porous Sealant Primer: 775 g/L.
      - 11) Other Sealant Primer: 750 g/L.
      - 12) PVC Welding Adhesives: 510 g/L.

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- 13) CPVC Welding Adhesives: 490 g/L.
  - 14) ABS Welding Adhesives: 325 g/L.
  - 15) Plastic Cement Welding Adhesives: 250 g/L.
  - 16) Adhesive Primer for Plastic: 550 g/L.
  - 17) Contact Adhesive: 80 g/L.
  - 18) Special Purpose Contact Adhesive: 250 g/L.
  - 19) Structural Wood Member Adhesive: 140 g/L.
  - 20) Sheet Applied Rubber Lining Operations: 850 g/L.
  - 21) Top and Trim Adhesive: 250 g/L.
  - 22) Architectural Sealants: 250 g/L.
  - 23) Other Sealants: 420 g/L.
2. Aerosol adhesives applied on site within the weatherproofing membrane must comply with the following Green Seal GS-36.
    - a. Aerosol Adhesive, General-Purpose Mist Spray: 65 percent VOCs by weight.
    - b. Aerosol Adhesive, General-Purpose Web Spray: 55 percent VOCs by weight.
    - c. Special-Purpose Aerosol Adhesive (All Types): 70 percent VOCs by weight.
  3. Paints and coatings applied on site within the weatherproofing membrane must comply with the following criteria:
    - a. VOC content limits for paints and coatings established in Green Seal Standard GS-11.
    - b. VOC content limit for anti-corrosive and anti-rust paints applied to interior ferrous metal substrates of 250 g/L established in Green Seal GC-03.
    - c. Clear wood finishes, floor coatings, stains, primers, sealers, and shellacs applied to interior elements must not exceed VOC content limits established in SCAQMD Rule 1113.
    - d. Comply with the following VOC content limits:
      - 1) Anti-Corrosive/Antirust Paints: 250 g/L.
      - 2) Clear Wood Finish, Lacquer: 550 g/L.
      - 3) Clear Wood Finish, Sanding Sealer: 350 g/L.
      - 4) Clear Wood Finish, Varnish: 350 g/L.
      - 5) Floor Coating: 100 g/L.
      - 6) Interior Flat Paint, Coating or Primer: 50 g/L.
      - 7) Interior Non-Flat Paint, Coating or Primer: 150 g/L.
      - 8) Sealers and Undercoaters: 200 g/L.
      - 9) Shellac, Clear: 730 g/L.
      - 10) Shellac, Pigmented: 550 g/L.
      - 11) Stain: 250 g/L.
      - 12) Clear Brushing Lacquer: 680 g/L.
      - 13) Concrete Curing Compounds: 350 g/L.
      - 14) Japans/Faux Finishing Coatings: 350 g/L.
      - 15) Magnesite Cement Coatings: 450 g/L.
      - 16) Pigmented Lacquer: 550 g/L.
      - 17) Waterproofing Sealers: 250 g/L.
      - 18) Wood Preservatives: 350 g/L.
      - 19) Low-Solids Coatings: 120 g/L.
  4. Carpet installed in building interior must comply with one of the following:
    - a. Meet testing and product requirements of the Carpet and Rug Institute Green Label Plus program.
    - b. Maximum VOC concentrations specified in CDPH Standard Method V1.1-2010, using office scenario at the 14 day time point.
  5. Each non-carpet flooring element installed in building interior which is not inherently non-emitting (stone, ceramic, powder-coated metals, plated or anodized metal, glass, concrete, clay brick, and unfinished or untreated solid wood flooring) must comply with one of the following:

- a. Meet requirements of the FloorScore standard as shown with testing by an independent third-party.
  - b. Maximum VOC concentrations specified in CDPH Standard Method V1.1-2010, using office scenario at 14 day time point.
  6. Composite wood and agrifiber products used within the weatherproofing membrane must contain no added urea-formaldehyde resins.
  7. Laminating adhesives used to fabricate on-site and shop-applied composite wood and agrifiber assemblies must not contain added urea-formaldehyde.
- C. Recycled Content:
1. Any products being installed or used that are listed on EPA Comprehensive Procurement Guidelines designated product list must meet or exceed the EPA's recycled content recommendations. The EPA Comprehensive Procurement Guidelines categories include:
    - a. Building insulation.
    - b. Cement and concrete.
    - c. Consolidated and reprocessed latex paint.
    - d. Floor tiles.
    - e. Flowable fill.
    - f. Laminated paperboard.
    - g. Modular threshold ramps.
    - h. Nonpressure pipe.
    - i. Patio blocks.
    - j. Railroad grade crossing surfaces.
    - k. Roofing materials.
    - l. Shower and restroom dividers/partitions.
    - m. Structural fiberboard.
    - n. Nylon carpet and nylon carpet backing.
    - o. Compost and fertilizer made from recovered organic materials.
    - p. Hydraulic mulch.
    - q. Lawn and garden edging.
    - r. Plastic lumber landscaping timbers and posts.
    - s. Park benches and picnic tables.
    - t. Plastic fencing.
    - u. Playground equipment.
    - v. Playground surfaces.
    - w. Bike racks.
- D. Biobased Content:
1. Materials and equipment being installed or used that are listed on the USDA BioPreferred program product category list must meet or exceed USDA's minimum biobased content threshold. Refer to individual specification sections for detailed requirements applicable to that section.
    - a. USDA BioPreferred program categories include:
      - 1) Adhesive and Mastic Removers.
      - 2) Carpets.
      - 3) Cleaners.
      - 4) Composite Panels.
      - 5) Corrosion Preventatives.
      - 6) Erosion Control Materials.
      - 7) Dust Suppressants.
      - 8) Fertilizers.
      - 9) Floor Cleaners and Protectors.
      - 10) Floor Coverings (Non-Carpet).
      - 11) Glass Cleaners.
      - 12) Hydraulic Fluids.
      - 13) Industrial Cleaners.

- 14) Interior Paints and Coatings.
  - 15) Mulch and Compost Materials.
  - 16) Multipurpose Cleaners.
  - 17) Multipurpose Lubricants.
  - 18) Packaging Films.
  - 19) Paint Removers.
  - 20) Plastic Insulating Foam.
  - 21) Pneumatic Equipment Lubricants.
  - 22) Roof Coatings.
  - 23) Wastewater Systems Coatings.
  - 24) Water Tank Coatings.
  - 25) Wood and Concrete Sealers.
  - 26) Wood and Concrete Stains.
- E. Materials, products, and equipment being installed which fall into a category covered by the WaterSense program must be WaterSense-labeled or meet or exceed WaterSense program performance requirements, unless disallowed for infection control reasons.
1. WaterSense categories include:
    - a. Bathroom Faucets
    - b. Commercial Toilets
    - c. Irrigation Controllers
    - d. Pre-Rinse Spray Valves
    - e. Residential Toilets
    - f. Showerheads
    - g. Spray Sprinkler Bodies
    - h. Urinals
- F. Materials, products, and equipment being installed which fall into any of the following product categories must be Energy Star-labeled.
1. Applicable Energy Star product categories as of 09/14/2017 include:
    - a. Appliances:
      - 1) Air Purifiers and Cleaners.
      - 2) Clothes Dryers (Residential).
      - 3) Clothes Washers (Commercial & Residential).
      - 4) Dehumidifiers.
      - 5) Dishwashers (Residential).
      - 6) Freezers (Residential).
      - 7) Refrigerators (Residential).
    - b. Electronics and Information Technology:
      - 1) Audio/Video Equipment.
      - 2) Computers.
      - 3) Data Center Storage.
      - 4) Digital Media Player.
      - 5) Enterprise Servers.
      - 6) Imaging Equipment.
      - 7) Monitors.
      - 8) Professional Displays.
      - 9) Set-Top and Cable Boxes.
      - 10) Telephones.
      - 11) Televisions.
      - 12) Uninterruptible Power Supplies.
      - 13) Voice over Internet Protocol (VoIP) Phones.
    - c. Food Service Equipment (Commercial):
      - 1) Dishwashers.
      - 2) Fryers.
      - 3) Griddles.

- 4) Hot Food Holding Cabinets.
  - 5) Ice Makers.
  - 6) Ovens.
  - 7) Refrigerators and Freezers.
  - 8) Steam Cookers.
  - 9) Vending Machines.
  - d. Heating and Cooling Equipment:
    - 1) Air-Source Heat Pumps (Residential).
    - 2) Boilers.
    - 3) Ceiling Fans (Residential).
    - 4) Central Air Conditioners (Residential).
    - 5) Ductless Heating and Cooling (Residential).
    - 6) Furnaces (Residential).
    - 7) Water Heaters.
    - 8) Geothermal Heat Pumps (Residential).
    - 9) Light Commercial Heating and Cooling Equipment.
    - 10) Room Air Conditioners (Residential).
    - 11) Ventilation Fans (Residential).
  - e. Other:
    - 1) Decorative Light Strings.
    - 2) Electric Vehicle Supply Equipment.
    - 3) Laboratory-Grade Refrigerators and Freezers.
    - 4) Light Bulbs.
    - 5) Light Fixtures.
    - 6) Pool Pumps.
    - 7) Roof Products.
    - 8) Water Coolers.
    - 9) Windows, Doors, and Skylights.
- G. Materials, products, and equipment being installed which fall into any of the following categories must be FEMP-designated. FEMP-designated product categories as of 09/14/2017 include:
1. Boilers (Commercial).
  2. Dishwashers (Commercial).
  3. Electric Chillers, Air-Cooled (Commercial).
  4. Electric Chillers, Water-Cooled (Commercial).
  5. Exterior Lighting.
  6. Fluorescent Ballasts.
  7. Fluorescent Lamps, General Service.
  8. Ice Machines, Water-Cooled.
  9. Industrial Lighting (High/Low Bay).
  10. Light Emitting Diode (LED) Luminaires.
- H. Electronic products and equipment being installed which fall into any of the following categories shall be EPEAT registered. Electronic products and equipment covered by EPEAT program as of 09/14/2017 include:
1. Computers.
  2. Displays.
  3. Imaging Equipment.
  4. Televisions.

## **PART 3 - EXECUTION**

### **3.1 FIELD QUALITY CONTROL**

- A. Construction Indoor Air Quality Management:

1. During construction, meet or exceed recommended control measures of ANSI/SMACNA 008-2008, Chapter 3.
2. Protect stored on-site and installed absorptive materials from moisture damage.
3. If permanently installed air handlers are used during construction, filtration media with a minimum efficiency reporting value (MERV) of 8 must be used at each return air grille, as determined by ASHRAE Standard 52.2-1999 (with errata but without addenda). Replace all filtration media immediately prior to occupancy.
4. Perform building flush-out as follows:
  - a. After construction ends, prior to occupancy and with interior finishes installed, perform a building flush-out by supplying a total volume of 14000 cu. ft. of outdoor air per sq. ft. of floor area while maintaining an internal temperature of at least 60 degrees Fahrenheit and a relative humidity no higher than 60 percent. OR
  - b. If occupancy is desired prior to flush-out completion, the space may be occupied following delivery of a minimum of 3500 cu. ft. of outdoor air per sq. ft. of floor area to the space. Once a space is occupied, it must be ventilated at a minimum rate of 0.30 cfm per sq. ft. of outside air or design minimum outside air rate determined until a total of 14000 cu. ft./sq. ft. of outside air has been delivered to the space. During each day of flush-out period, ventilation must begin a minimum of three hours prior to occupancy and continue during occupancy.
5. Provide construction dust control to comply with SCAQMD Rule 403.

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## SECTION 01 91 00

### GENERAL COMMISSIONING REQUIREMENTS

#### PART 1 - GENERAL

##### 1.1 COMMISSIONING DESCRIPTION

- A. This Section 01 91 00 GENERAL COMMISSIONING REQUIREMENTS shall form the basis of the construction phase commissioning process and procedures. The Commissioning Agent shall add, modify, and refine the commissioning procedures, as approved by the Department of Veterans Affairs (VA), to suit field conditions and actual manufacturer's equipment, incorporate test data and procedure results, and provide detailed scheduling for all commissioning tasks.
- B. Various sections of the project specifications require equipment startup, testing, and adjusting services. Requirements for startup, testing, and adjusting services specified in the Division 7, Division 21, Division 22, Division 23, Division 26, Division 27, Division 28, and Division 31 series sections of these specifications are intended to be provided in coordination with the commissioning services and are not intended to duplicate services. The Contractor shall coordinate the work required by individual specification sections with the commissioning services requirements specified herein.
- C. Where individual testing, adjusting, or related services are required in the project specifications and not specifically required by this commissioning requirements specification, the specified services shall be provided and copies of documentation, as required by those specifications shall be submitted to the VA and the Commissioning Agent to be indexed for future reference.
- D. Where training or educational services for VA are required and specified in other sections of the specifications, including but not limited to Division 7, Division 8, Division 21, Division 22, Division 23, Division 26, Division 27, Division 28, and Division 31 series sections of the specification, these services are intended to be provided in addition to the training and educational services specified herein.
- E. Commissioning is a systematic process of verifying that the building systems perform interactively according to the construction documents and the VA's operational needs. The commissioning process shall encompass and coordinate the system documentation, equipment startup, control system calibration, testing and balancing, performance testing and training. Commissioning during the construction and post-occupancy phases is intended to achieve the following specific objectives according to the contract documents:
  - 1. Verify that the applicable equipment and systems are installed in accordance with the contract documents and according to the manufacturer's recommendations.
  - 2. Verify and document proper integrated performance of equipment and systems.
  - 3. Verify that Operations & Maintenance documentation is complete.
  - 4. Verify that all components requiring servicing can be accessed, serviced and removed without disturbing nearby components including ducts, piping, cabling or wiring.
  - 5. Verify that the VA's operating personnel are adequately trained to enable them to operate, monitor, adjust, maintain, and repair building systems in an effective and energy-efficient manner.
  - 6. Document the successful achievement of the commissioning objectives listed above.
- F. The commissioning process does not take away from or reduce the responsibility of the Contractor to provide a finished and fully functioning product.

##### 1.2 CONTRACTUAL RELATIONSHIPS

- A. For this construction project, the Department of Veterans Affairs contracts with a Contractor to provide construction services. The contracts are administered by the VA Contracting Officer and the Resident Engineer as the designated representative of the Contracting Officer. On this

project, the authority to modify the contract in any way is strictly limited to the authority of the Contracting Officer.

- B. In this project, only two contract parties are recognized and communications on contractual issues are strictly limited to VA Resident Engineer and the Contractor. It is the practice of the VA to require that communications between other parties to the contracts (Subcontractors and Vendors) be conducted through the Resident Engineer and Contractor. It is also the practice of the VA that communications between other parties of the project (Commissioning Agent and Architect/Engineer) be conducted through the Resident Engineer.
- C. Whole Building Commissioning is a process that relies upon frequent and direct communications, as well as collaboration between all parties to the construction process. By its nature, a high level of communication and cooperation between the Commissioning Agent and all other parties (Architects, Engineers, Subcontractors, Vendors, third party testing agencies, etc.) is essential to the success of the Commissioning effort.
- D. With these fundamental practices in mind, the commissioning process described herein has been developed to recognize that, in the execution of the Commissioning Process, the Commissioning Agent must develop effective methods to communicate with every member of the construction team involved in delivering commissioned systems while simultaneously respecting the exclusive contract authority of the Contracting Officer and Resident Engineer. Thus, the procedures outlined in this specification must be executed within the following limitations:
  - 1. No communications (verbal or written) from the Commissioning Agent shall be deemed to constitute direction that modifies the terms of any contract between the Department of Veterans Affairs and the Contractor.
  - 2. Commissioning Issues identified by the Commissioning Agent will be delivered to the Resident Engineer and copied to the designated Commissioning Representatives for the Contractor and subcontractors on the Commissioning Team for information only in order to expedite the communication process. These issues must be understood as the professional opinion of the Commissioning Agent and as suggestions for resolution.
  - 3. In the event that any Commissioning Issues and suggested resolutions are deemed by the Resident Engineer to require either an official interpretation of the construction documents or require a modification of the contract documents, the Contracting Officer or Resident Engineer will issue an official directive to this effect.
  - 4. All parties to the Commissioning Process shall be individually responsible for alerting the Resident Engineer of any issues that they deem to constitute a potential contract change prior to acting on these issues.
  - 5. Authority for resolution or modification of design and construction issues rests solely with the Contracting Officer or Resident Engineer, with appropriate technical guidance from the Architect/Engineer and/or Commissioning Agent.

### **1.3 RELATED WORK**

- A. Section 01 00 00 GENERAL REQUIREMENTS.
- B. Section 01 32.16 NETWORK ANALYSIS SCHEDULES
- C. Section 01 32.16.15 PROJECT SCHEDULES (SMALL PROJECTS – DESIGN/BID/BUILD)
- D. Section 01 32.16.16 NETWORK ANALYSIS SCHEDULES (SMALL PROJECTS – DESIGN/BID/BUILD)
- E. Section 01 32.16.17 PROJECT SCHEDULES (SMALL PROJECTS- DESIGN/BUILD)
- F. Section 01 33 23 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES
- G. Section 01 45 00 QUALITY CONTROL.
- H. Section 01 81 13 SUSTAINABLE CONSTRUCTION REQUIREMENTS

- I. Section 07 08 00 FACILITY EXTERIOR CLOSURE COMMISSIONING.
- J. Section 21 08 00 COMMISSIONING OF FIRE PROTECTION SYSTEMS.
- K. Section 22 08 00 COMMISSIONING OF PLUMBING SYSTEMS.
- L. Section 23 08 00 COMMISSIONING OF HVAC SYSTEMS.
- M. Section 26 08 00 COMMISSIONING OF ELECTRICAL SYSTEMS.
- N. Section 27 08 00 COMMISSIONING OF COMMUNICATIONS SYSTEMS.
- O. Section 28 08 00 COMMISSIONING OF ELECTRONIC SAFETY AND SECURITY SYSTEMS.
- P. Section 33 08 00 COMMISSIONING OF SITE UTILITIES.

**1.4 SUMMARY**

- A. This Section includes general requirements that apply to implementation of commissioning without regard to systems, subsystems, and equipment being commissioned.
- B. The commissioning activities have been developed to support the VA requirements to meet guidelines for Federal Leadership in Environmental, Energy, and Economic Performance.
- C. The commissioning activities have been developed to support the United States Green Building Council's (USGBC) LEED™ rating program and to support delivery of project performance in accordance with the VA requirements developed for the project to support the following credits:
  - 1. Commissioning activities and documentation for the LEED™ section on "Energy and Atmosphere" and the prerequisite of "Fundamental Building Systems Commissioning."
  - 2. Commissioning activities and documentation for the LEED™ section on "Energy and Atmosphere" requirements for the "Enhanced Building System Commissioning" credit.
  - 3. Activities and documentation for the LEED™ section on "Measurement and Verification" requirements for the Measurement and Verification credit.
- D. The commissioning activities have been developed to support the Green Buildings Initiative's Green Globes rating program and to support delivery of project performance in accordance with the VA requirements developed for the project.

**1.5 ACRONYMS**

List of Acronyms	
Acronym	Meaning
A/E	Architect / Engineer Design Team
AHJ	Authority Having Jurisdiction
ASHRAE	Association Society for Heating Air Condition and Refrigeration Engineers
BOD	Basis of Design
BSC	Building Systems Commissioning
CCTV	Closed Circuit Television
CD	Construction Documents
CMMS	Computerized Maintenance Management System
CO	Contracting Officer (VA)
COR	Contracting Officer's Representative (see also VA-RE)
COBie	Construction Operations Building Information Exchange
CPC	Construction Phase Commissioning

List of Acronyms	
Acronym	Meaning
Cx	Commissioning
CxA	Commissioning Agent
CxM	Commissioning Manager
CxR	Commissioning Representative
DPC	Design Phase Commissioning
FPT	Functional Performance Test
GBI-GG	Green Building Initiative - Green Globes
HVAC	Heating, Ventilation, and Air Conditioning
LEED	Leadership in Energy and Environmental Design
NC	Department of Veterans Affairs National Cemetery
NCA	Department of Veterans Affairs National Cemetery Administration
NEBB	National Environmental Balancing Bureau
O&M	Operations & Maintenance
OPR	Owner's Project Requirements
PFC	Pre-Functional Checklist
PFT	Pre-Functional Test
SD	Schematic Design
SO	Site Observation
TAB	Test Adjust and Balance
VA	Department of Veterans Affairs
VAMC	VA Medical Center
VA CFM	VA Office of Construction and Facilities Management
VACO	VA Central Office
VA PM	VA Project Manager
VA-RE	VA Resident Engineer
USGBC	United States Green Building Council

## 1.6 DEFINITIONS

**Acceptance Phase Commissioning:** Commissioning tasks executed after most construction has been completed, most Site Observations and Static Tests have been completed and Pre-Functional Testing has been completed and accepted. The main commissioning activities performed during this phase are verification that the installed systems are functional by conducting Systems Functional Performance tests and Owner Training.

**Accuracy:** The capability of an instrument to indicate the true value of a measured quantity.

**Back Check:** A back check is a verification that an agreed upon solution to a design comment has been adequately addressed in a subsequent design review

**Basis of Design (BOD):** The Engineer'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.

**Benchmarks:** Benchmarks are the comparison of a building's energy usage to other similar buildings and to the building itself.. For example, ENERGY STAR Portfolio Manager is a frequently used and nationally recognized building energy benchmarking tool.

**Building Information Modeling (BIM):** Building Information Modeling is a parametric database which allows a building to be designed and constructed virtually in 3D, and provides reports both in 2D views and as schedules. This electronic information can be extracted and reused for pre-populating facility management CMMS systems. Building Systems Commissioning (BSC): NEBB acronym used to designate its commissioning program.

**Calibrate:** The act of comparing an instrument of unknown accuracy with a standard of known accuracy to detect, correlate, report, or eliminate by adjustment any variation in the accuracy of the tested instrument.

**CCTV:** Closed circuit Television. Normally used for security surveillance and alarm detections as part of a special electrical security system.

**COBie:** Construction Operations Building Information Exchange (COBie) is an electronic industry data format used to transfer information developed during design, construction, and commissioning into the Computer Maintenance Management Systems (CMMS) used to operate facilities. See the Whole Building Design Guide website for further information (<http://www.wbdg.org/resources/cobie.php>)

**Commissionability:** Defines a design component or construction process that has the necessary elements that will allow a system or component to be effectively measured, tested, operated and commissioned

**Commissioning Agent (CxA):** The qualified Commissioning Professional who administers the Cx process by managing the Cx team and overseeing the Commissioning Process. Where CxA is used in this specification it 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.

**Commissioning Checklists:** Lists of data or inspections to be verified to ensure proper system or component installation, operation, and function. Verification checklists are developed and used during all phases of the commissioning process to verify that the Owner's Project Requirements (OPR) is being achieved.

**Commissioning Design Review:** The commissioning design review is a collaborative review of the design professionals design documents for items pertaining to the following: owner's project requirements; basis of design; operability and maintainability (O&M) including documentation; functionality; training; energy efficiency, control systems' sequence of operations including building automation system features; commissioning specifications and the ability to functionally test the systems.

**Commissioning Issue:** A 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. A condition that is in conflict with the Contract Documents and/or performance requirements of the installed systems and components. (See also – Commissioning Observation).

**Commissioning Manager (CxM):** A qualified individual appointed by the Contractor to manage the commissioning process on behalf of the Contractor.

**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)

**Commissioning Plan:** A document that outlines the commissioning process, commissioning scope and defines responsibilities, processes, schedules, and the documentation requirements of the Commissioning Process.

**Commissioning Process:** A quality focused process for enhancing the delivery of a project. The process focuses upon verifying and documenting that the facility and all of its systems, components, and assemblies are planned, designed, installed, tested, can be operated, and maintained to meet the Owner's Project Requirements.

**Commissioning Report:** The final commissioning document which presents the commissioning process results for the project. Cx reports include an executive summary, the commissioning plan, issue log, correspondence, and all appropriate check sheets and test forms.

**Commissioning Representative (CxR):** An individual appointed by a sub-contractor to manage the commissioning process on behalf of the sub-contractor.

**Commissioning Specifications:** The contract documents that detail the objective, scope and implementation of the commissioning process as developed in the Commissioning Plan.

**Commissioning Team:** Individual team members whose coordinated actions are responsible for implementing the Commissioning Process.

**Construction Phase Commissioning:** All commissioning efforts executed during the construction process after the design phase and prior to the Acceptance Phase Commissioning.

**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.

**Construction Phase Commissioning (CPC):** All commissioning efforts executed during the construction process after the design phase and prior to the Acceptance Phase Commissioning.

**Coordination Drawings:** Drawings showing the work of all trades that are used to illustrate that equipment can be installed in the space allocated without compromising equipment function or access for maintenance and replacement. These drawings graphically illustrate and dimension manufacturers' recommended maintenance clearances. On mechanical projects, coordination drawings include structural steel, ductwork, major piping and electrical conduit and show the elevations and locations of the above components.

**Data Logging:** The monitoring and recording of temperature, flow, current, status, pressure, etc. of equipment using stand-alone data recorders.

**Deferred System Test:** Tests that cannot be completed at the end of the acceptance phase due to ambient conditions, schedule issues or other conditions preventing testing during the normal acceptance testing period.

**Deficiency:** See "Commissioning Issue".

**Design Criteria:** A listing of the VA Design Criteria outlining the project design requirements, including its source. These are used during the design process to show the design elements meet the OPR.

**Design Intent:** The overall term that includes the OPR and the BOD. It is a detailed explanation of the ideas, concepts, and criteria that are defined by the owner to be important. The design intent documents are utilized to provide a written record of these ideas, concepts and criteria.

**Design Narrative:** A written description of the proposed design solutions that satisfy the requirements of the OPR.

**Design Phase Commissioning (DPC):** All commissioning tasks executed during the design phase of the project.

**Environmental Systems:** Systems that use a combination of mechanical equipment, airflow, water flow and electrical energy to provide heating, ventilating, air conditioning,

humidification, and dehumidification for the purpose of human comfort or process control of temperature and humidity.

**Executive Summary:** A section of the Commissioning report that reviews the general outcome of the project. It also includes any unresolved issues, recommendations for the resolution of unresolved issues and all deferred testing requirements.

**Functionality:** This defines a design component or construction process which will allow a system or component to operate or be constructed in a manner that will produce the required outcome of the OPR.

**Functional Test Procedure (FTP):** A written protocol that defines methods, steps, personnel, and acceptance criteria for tests conducted on components, equipment, assemblies, systems, and interfaces among systems.

**Industry Accepted Best Practice:** A design component or construction process that has achieved industry consensus for quality performance and functionality. Refer to the current edition of the NEBB Design Phase Commissioning Handbook for examples.

**Installation Verification:** Observations or inspections that confirm the system or component has been installed in accordance with the contract documents and to industry accepted best practices.

**Integrated System Testing:** Integrated Systems Testing procedures entail testing of multiple integrated systems performance to verify proper functional interface between systems. Typical Integrated Systems Testing includes verifying that building systems respond properly to loss of utility, transfer to emergency power sources, re-transfer from emergency power source to normal utility source; interface between HVAC controls and Fire Alarm systems for equipment shutdown, interface between Fire Alarm system and elevator control systems for elevator recall and shutdown; interface between Fire Alarm System and Security Access Control Systems to control access to spaces during fire alarm conditions; and other similar tests as determined for each specific project.

**Issues Log:** A formal and ongoing record of problems or concerns – and their resolution – that have been raised by members of the Commissioning Team during the course of the Commissioning Process.

**Lessons Learned Workshop:** A workshop conducted to discuss and document project successes and identify opportunities for improvements for future projects.

**Maintainability:** A design component or construction process that will allow a system or component to be effectively maintained. This includes adequate room for access to adjust and repair the equipment. Maintainability also includes components that have readily obtainable repair parts or service.

**Manual Test:** Testing using hand-held instruments, immediate control system readouts or direct observation to verify performance (contrasted to analyzing monitored data taken over time to make the 'observation').

**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.

**Peer Review:** A formal in-depth review separate from the commissioning review processes. The level of effort and intensity is much greater than a typical commissioning facilitation or extended commissioning review. The VA usually hires an independent third-party (called the IDIQ A/E) to conduct peer reviews.

**Precision:** The ability of an instrument to produce repeatable readings of the same quantity under the same conditions. The precision of an instrument refers to its ability to produce a tightly grouped set of values around the mean value of the measured quantity.

**Pre-Design Phase Commissioning:** Commissioning tasks performed prior to the commencement of design activities that includes project programming and the development of the commissioning process for the project

**Pre-Functional Checklist (PFC):** A form used by the contractor to verify that appropriate components are onsite, correctly installed, set up, calibrated, functional and ready for functional testing.

**Pre-Functional Test (PFT):** An inspection or test that is done before functional testing. PFT's include installation verification and system and component start up tests.

**Procedure or Protocol:** A defined approach that outlines the execution of a sequence of work or operations. Procedures are used to produce repeatable and defined results.

**Range:** The upper and lower limits of an instrument's ability to measure the value of a quantity for which the instrument is calibrated.

**Resolution:** This word has two meanings in the Cx Process. The first refers to the smallest change in a measured variable that an instrument can detect. The second refers to the implementation of actions that correct a tested or observed deficiency.

**Site Observation Visit:** On-site inspections and observations made by the Commissioning Agent for the purpose of verifying component, equipment, and system installation, to observe contractor testing, equipment start-up procedures, or other purposes.

**Site Observation Reports (SO):** Reports of site inspections and observations made by the Commissioning Agent. Observation reports are intended to provide early indication of an installation issue which will need correction or analysis.

**Special System Inspections:** Inspections required by a local code authority prior to occupancy and are not normally a part of the commissioning process.

**Static Tests:** Tests or inspections that validate a specified static condition such as pressure testing. Static tests may be specification or code initiated.

**Start Up Tests:** Tests that validate the component or system is ready for automatic operation in accordance with the manufactures requirements.

**Systems Manual:** A system-focused composite document that includes all information required for the owners operators to operate the systems.

**Test Procedure:** A written protocol that defines methods, personnel, and expectations for tests conducted on components, equipment, assemblies, systems, and interfaces among systems.

**Testing:** The use of specialized and calibrated instruments to measure parameters such as: temperature, pressure, vapor flow, air flow, fluid flow, rotational speed, electrical characteristics, velocity, and other data in order to determine performance, operation, or function.

**Testing, Adjusting, and Balancing (TAB):** A systematic process or service applied to heating, ventilating and air-conditioning (HVAC) systems and other environmental systems to achieve and document air and hydronic flow rates. The standards and procedures for providing these services are referred to as "Testing, Adjusting, and Balancing" and are described in the Procedural Standards for the Testing, Adjusting and Balancing of Environmental Systems, published by NEBB or AABC.

**Thermal Scans:** Thermographic pictures taken with an Infrared Thermographic Camera. Thermographic pictures show the relative temperatures of objects and surfaces and are used to identify leaks, thermal bridging, thermal intrusion, electrical overload conditions, moisture containment, and insulation failure.

**Training Plan:** A written document that details, in outline form the expectations of the operator training. Training agendas should include instruction on how to obtain service, operate, startup, shutdown and maintain all systems and components of the project.

**Trending:** Monitoring over a period of time with the building automation system.

**Unresolved Commissioning Issue:** Any Commissioning Issue that, at the time that the Final Report or the Amended Final Report is issued that has not been either resolved by the construction team or accepted by the VA. Validation: The process by which work is verified as complete and operating correctly:

1. First party validation occurs when a firm or individual verifying the task is the same firm or individual performing the task.
2. Second party validation occurs when the firm or individual verifying the task is under the control of the firm performing the task or has other possibilities of financial conflicts of interest in the resolution (Architects, Designers, General Contractors and Third Tier Subcontractors or Vendors).

3. Third party validation occurs when the firm verifying the task is not associated with or under control of the firm performing or designing the task.  
**Verification:** The process by which specific documents, components, equipment, assemblies, systems, and interfaces among systems are confirmed to comply with the criteria described in the Owner's Project Requirements.  
**Warranty Phase Commissioning:** Commissioning efforts executed after a project has been completed and accepted by the Owner. Warranty Phase Commissioning includes follow-up on verification of system performance, measurement and verification tasks and assistance in identifying warranty issues and enforcing warranty provisions of the construction contract.  
**Warranty Visit:** A commissioning meeting and site review where all outstanding warranty issues and deferred testing is reviewed and discussed.  
**Whole Building Commissioning:** Commissioning of building systems such as Building Envelope, HVAC, Electrical, Special Electrical (Fire Alarm, Security & Communications), Plumbing and Fire Protection as described in this specification.

**1.7 SYSTEMS TO BE COMMISSIONED**

- A. Commissioning of a system or systems specified for this project is part of the construction process. Documentation and testing of these systems, as well as training of the VA's Operation and Maintenance personnel, is required in cooperation with the VA and the Commissioning Agent.
- B. The following systems will be commissioned as part of this project:

<b>Systems To Be Commissioned</b>	
<b>System</b>	<b>Description</b>
<b>Building Exterior Closure</b>	
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.)
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.
<b>Fire Suppression</b>	
Fire Sprinkler Systems	Wet pipe system, dry pipe system, pre-action system, special agent systems
<b>Plumbing</b>	

<b>Systems To Be Commissioned</b>	
<b>System</b>	<b>Description</b>
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*
<b>HVAC</b>	
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

<b>Systems To Be Commissioned</b>	
<b>System</b>	<b>Description</b>
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
<b>Electrical</b>	
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
<b>Communications</b>	
Grounding & Bonding System	Witness 3rd party testing, review reports

<b>Systems To Be Commissioned</b>	
<b>System</b>	<b>Description</b>
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
<b>Electronic Safety and Security</b>	
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.
<b>Site Utilities</b>	
Water Utilities	City Water Service Entrance, Backflow Prevention, Pressure Control, Booster Pumps, Irrigation 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
<b>Integrated Systems Tests</b>	

<b>Systems To Be Commissioned</b>	
<b>System</b>	<b>Description</b>
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
<b>Table Notes</b>	
** Denotes systems that LEED requires to be commissioned to comply with the LEED Fundamental Commissioning pre-requisite.	

**1.8 COMMISSIONING TEAM**

- A. The commissioning team shall consist of, but not be limited to, representatives of Contractor, including Project Superintendent and subcontractors, installers, schedulers, suppliers, and specialists deemed appropriate by the Department of Veterans Affairs (VA) and Commissioning Agent.
- B. Members Appointed by Contractor:
  - 1.
  - 2. Contractor' Commissioning Manager: The designated person, company, or entity that plans, schedules and coordinates the commissioning activities for the construction team.
  - 3. Contractor's Commissioning Representative(s): Individual(s), each having authority to act on behalf of the entity he or she represents, explicitly organized to implement the commissioning process through coordinated actions.
- C. Members Appointed by VA:
  - 1. Commissioning Agent: The designated person, company, or entity that plans, schedules, and coordinates the commissioning team to implement the commissioning process. The VA will engage the CxA under a separate contract.
  - 2. User: Representatives of the facility user and operation and maintenance personnel.
  - 3. A/E: Representative of the Architect and engineering design professionals.

**1.9 VA'S COMMISSIONING RESPONSIBILITIES**

- A. Appoint an individual, company or firm to act as the Commissioning Agent.
- B. Assign operation and maintenance personnel and schedule them to participate in commissioning team activities including, but not limited to, the following:
  - 1. Coordination meetings.
  - 2. Training in operation and maintenance of systems, subsystems, and equipment.
  - 3. Testing meetings.
  - 4. Witness and assist in Systems Functional Performance Testing.
  - 5. Demonstration of operation of systems, subsystems, and equipment.
- C. Provide the Construction Documents, prepared by Architect and approved by VA, to the Commissioning Agent and for use in managing the commissioning process, developing the commissioning plan, systems manuals, and reviewing the operation and maintenance training plan.

**1.10 CONTRACTOR'S COMMISSIONING RESPONSIBILITIES**

- A. The Contractor shall assign a Commissioning Manager to manage commissioning activities of the Contractor, and subcontractors.

- B. The Contractor shall ensure that the commissioning responsibilities outlined in these specifications are included in all subcontracts and that subcontractors comply with the requirements of these specifications.
- C. The Contractor shall ensure that each installing subcontractor shall assign representatives with expertise and authority to act on behalf of the subcontractor and schedule them to participate in and perform commissioning team activities including, but not limited to, the following:
  - 1. Participate in commissioning coordination meetings.
  - 2. Conduct operation and maintenance training sessions in accordance with approved training plans.
  - 3. Verify that Work is complete and systems are operational according to the Contract Documents, including calibration of instrumentation and controls.
  - 4. Evaluate commissioning issues and commissioning observations identified in the Commissioning Issues Log, field reports, test reports or other commissioning documents. In collaboration with entity responsible for system and equipment installation, recommend corrective action.
  - 5. Review and comment on commissioning documentation.
  - 6. Participate in meetings to coordinate Systems Functional Performance Testing.
  - 7. Provide schedule for operation and maintenance data submittals, equipment startup, and testing to Commissioning Agent for incorporation into the commissioning plan.
  - 8. Provide information to the Commissioning Agent for developing commissioning plan.
  - 9. Participate in training sessions for VA's operation and maintenance personnel.
  - 10. Provide technicians who are familiar with the construction and operation of installed systems and who shall develop specific test procedures to conduct Systems Functional Performance Testing of installed systems.

**1.11 COMMISSIONING AGENT'S RESPONSIBILITIES**

- A. Organize and lead the commissioning team.
- B. Prepare the commissioning plan. See Paragraph 1.11-A of this specification Section for further information.
- C. Review and comment on selected submittals from the Contractor for general conformance with the Construction Documents. Review and comment on the ability to test and operate the system and/or equipment, including providing gages, controls and other components required to operate, maintain, and test the system. Review and comment on performance expectations of systems and equipment and interfaces between systems relating to the Construction Documents.
- D. At the beginning of the construction phase, conduct an initial construction phase coordination meeting for the purpose of reviewing the commissioning activities and establishing tentative schedules for operation and maintenance submittals; operation and maintenance training sessions; TAB Work; Pre-Functional Checklists, Systems Functional Performance Testing; and project completion.
- E. Convene commissioning team meetings for the purpose of coordination, communication, and conflict resolution; discuss status of the commissioning processes. Responsibilities include arranging for facilities, preparing agenda and attendance lists, and notifying participants. The Commissioning Agent shall prepare and distribute minutes to commissioning team members and attendees within five workdays of the commissioning meeting.
- F. Observe construction and report progress, observations and issues. Observe systems and equipment installation for adequate accessibility for maintenance and component replacement or repair, and for general conformance with the Construction Documents.
- G. Prepare Project specific Pre-Functional Checklists and Systems Functional Performance Test procedures.
- H. Coordinate Systems Functional Performance Testing schedule with the Contractor.

General Commissioning Requirements

- I. Witness selected systems startups.
- J. Verify selected Pre-Functional Checklists completed and submitted by the Contractor.
- K. Witness and document Systems Functional Performance Testing.
- L. Compile test data, inspection reports, and certificates and include them in the systems manual and commissioning report.
- M. Review and comment on operation and maintenance (O&M) documentation and systems manual outline for compliance with the Contract Documents. Operation and maintenance documentation requirements are specified in Paragraph 1.25, Section 01 00 00 GENERAL REQUIREMENTS.
- N. Review operation and maintenance training program developed by the Contractor. Verify training plans provide qualified instructors to conduct operation and maintenance training.
- O. Prepare commissioning Field Observation Reports.
- P. Prepare the Final Commissioning Report.
- Q. Return to the site at 10 months into the 12 month warranty period and review with facility staff the current building operation and the condition of outstanding issues related to the original and seasonal Systems Functional Performance Testing. Also interview facility staff and identify problems or concerns they have operating the building as originally intended. Make suggestions for improvements and for recording these changes in the O&M manuals. Identify areas that may come under warranty or under the original construction contract. Assist facility staff in developing reports, documents and requests for services to remedy outstanding problems.
- R. Assemble the final commissioning documentation, including the Final Commissioning Report and Addendum to the Final Commissioning Report.

#### **1.12 COMMISSIONING DOCUMENTATION**

- A. Commissioning Plan: A document, prepared by Commissioning Agent, that outlines the schedule, allocation of resources, and documentation requirements of the commissioning process, and shall include, but is not limited, to the following:
  - 1. Plan for delivery and review of submittals, systems manuals, and other documents and reports. Identification of the relationship of these documents to other functions and a detailed description of submittals that are required to support the commissioning processes. Submittal dates shall include the latest date approved submittals must be received without adversely affecting commissioning plan.
  - 2. Description of the organization, layout, and content of commissioning documentation (including systems manual) and a detailed description of documents to be provided along with identification of responsible parties.
  - 3. Identification of systems and equipment to be commissioned.
  - 4. Schedule of Commissioning Coordination meetings.
  - 5. Identification of items that must be completed before the next operation can proceed.
  - 6. Description of responsibilities of commissioning team members.
  - 7. Description of observations to be made.
  - 8. Description of requirements for operation and maintenance training.
  - 9. Schedule for commissioning activities with dates coordinated with overall construction schedule.
  - 10. Process and schedule for documenting changes on a continuous basis to appear in Project Record Documents.
  - 11. Process and schedule for completing prestart and startup checklists for systems, subsystems, and equipment to be verified and tested.
  - 12. Preliminary Systems Functional Performance Test procedures.

- B. Systems Functional Performance Test Procedures: The Commissioning Agent will develop Systems Functional Performance Test Procedures for each system to be commissioned, including subsystems, or equipment and interfaces or interlocks with other systems. Systems Functional Performance Test Procedures will include a separate entry, with space for comments, for each item to be tested. Preliminary Systems Functional Performance Test Procedures will be provided to the VA, Architect/Engineer, and Contractor for review and comment. The Systems Performance Test Procedure will include test procedures for each mode of operation and provide space to indicate whether the mode under test responded as required. Each System Functional Performance Test procedure, regardless of system, subsystem, or equipment being tested, shall include, but not be limited to, the following:
1. Name and identification code of tested system.
  2. Test number.
  3. Time and date of test.
  4. Indication of whether the record is for a first test or retest following correction of a problem or issue.
  5. Dated signatures of the person performing test and of the witness, if applicable.
  6. Individuals present for test.
  7. Observations and Issues.
  8. Issue number, if any, generated as the result of test.
- C. Pre-Functional Checklists: The Commissioning Agent will prepare Pre-Functional Checklists. Pre-Functional Checklists shall be completed and signed by the Contractor, verifying that systems, subsystems, equipment, and associated controls are ready for testing. The Commissioning Agent will spot check Pre-Functional Checklists to verify accuracy and readiness for testing. Inaccurate or incomplete Pre-Functional Checklists shall be returned to the Contractor for correction and resubmission.
- D. Test and Inspection Reports: The Commissioning Agent will record test data, observations, and measurements on Systems Functional Performance Test Procedure. The report will also include recommendation for system acceptance or non-acceptance. Photographs, forms, and other means appropriate for the application shall be included with data. Commissioning Agent Will compile test and inspection reports and test and inspection certificates and include them in systems manual and commissioning report.
- E. Corrective Action Documents: The Commissioning Agent will document corrective action taken for systems and equipment that fail tests. The documentation will include any required modifications to systems and equipment and/or revisions to test procedures, if any. The Commissioning Agent will witness and document any retesting of systems and/or equipment requiring corrective action and document retest results.
- F. Commissioning Issues Log: The Commissioning Agent will prepare and maintain Commissioning Issues Log that describes Commissioning Issues and Commissioning Observations that are identified during the Commissioning process. These observations and issues include, but are not limited to, those that are at variance with the Contract Documents. The Commissioning Issues Log will identify and track issues as they are encountered, the party responsible for resolution, progress toward resolution, and document how the issue was resolved. The Master Commissioning Issues Log will also track the status of unresolved issues.
1. Creating an Commissioning Issues Log Entry:
    - a. Identify the issue with unique numeric or alphanumeric identifier by which the issue may be tracked.
    - b. Assign a descriptive title for the issue.
    - c. Identify date and time of the issue.
    - d. Identify test number of test being performed at the time of the observation, if applicable, for cross reference.
    - e. Identify system, subsystem, and equipment to which the issue applies.
    - f. Identify location of system, subsystem, and equipment.
    - g. Include information that may be helpful in diagnosing or evaluating the issue.

- h. Note recommended corrective action.
      - i. Identify commissioning team member responsible for corrective action.
      - j. Identify expected date of correction.
      - k. Identify person that identified the issue.
    - 2. Documenting Issue Resolution:
      - a. Log date correction is completed or the issue is resolved.
      - b. Describe corrective action or resolution taken. Include description of diagnostic steps taken to determine root cause of the issue, if any.
      - c. Identify changes to the Contract Documents that may require action.
      - d. State that correction was completed and system, subsystem, and equipment are ready for retest, if applicable.
      - e. Identify person(s) who corrected or resolved the issue.
      - f. Identify person(s) verifying the issue resolution.
- G. Final Commissioning Report: The Commissioning Agent will document results of the commissioning process, including unresolved issues, and performance of systems, subsystems, and equipment. The Commissioning Report will indicate whether systems, subsystems, and equipment have been properly installed and are performing according to the Contract Documents. This report will be used by the Department of Veterans Affairs when determining that systems will be accepted. This report will be used to evaluate systems, subsystems, and equipment and will serve as a future reference document during VA occupancy and operation. It shall describe components and performance that exceed requirements of the Contract Documents and those that do not meet requirements of the Contract Documents. The commissioning report will include, but is not limited to, the following:
  - 1. Lists and explanations of substitutions; compromises; variances with the Contract Documents; record of conditions; and, if appropriate, recommendations for resolution. Design Narrative documentation maintained by the Commissioning Agent.
  - 2. Commissioning plan.
  - 3. Pre-Functional Checklists completed by the Contractor, with annotation of the Commissioning Agent review and spot check.
  - 4. Systems Functional Performance Test Procedures, with annotation of test results and test completion.
  - 5. Commissioning Issues Log.
  - 6. Listing of deferred and off season test(s) not performed, including the schedule for their completion.
- H. Addendum to Final Commissioning Report: The Commissioning Agent will prepare an Addendum to the Final Commissioning Report near the end of the Warranty Period. The Addendum will indicate whether systems, subsystems, and equipment are complete and continue to perform according to the Contract Documents. The Addendum to the Final Commissioning Report shall include, but is not limited to, the following:
  - 1. Documentation of deferred and off season test(s) results.
  - 2. Completed Systems Functional Performance Test Procedures for off season test(s).
  - 3. Documentation that unresolved system performance issues have been resolved.
  - 4. Updated Commissioning Issues Log, including status of unresolved issues.
  - 5. Identification of potential Warranty Claims to be corrected by the Contractor.
- I. Systems Manual: The Commissioning Agent will gather required information and compile the Systems Manual. The Systems Manual will include, but is not limited to, the following:
  - 1. Design Narrative, including system narratives, schematics, single-line diagrams, flow diagrams, equipment schedules, and changes made throughout the Project.
  - 2. Reference to Final Commissioning Plan.
  - 3. Reference to Final Commissioning Report.
  - 4. Approved Operation and Maintenance Data as submitted by the Contractor.

### 1.13 SUBMITTALS

- A. Preliminary Commissioning Plan Submittal: The Commissioning Agent has prepared a Preliminary Commissioning Plan based on the final Construction Documents. The Preliminary Commissioning Plan is included as an Appendix to this specification section. The Preliminary Commissioning Plan is provided for information only. It contains preliminary information about the following commissioning activities:
1. The Commissioning Team: A list of commissioning team members by organization.
  2. Systems to be commissioned. A detailed list of systems to be commissioned for the project. This list also provides preliminary information on systems/equipment submittals to be reviewed by the Commissioning Agent; preliminary information on Pre-Functional Checklists that are to be completed; preliminary information on Systems Performance Testing, including information on testing sample size (where authorized by the VA).
  3. Commissioning Team Roles and Responsibilities: Preliminary roles and responsibilities for each Commissioning Team member.
  4. Commissioning Documents: A preliminary list of commissioning-related documents, include identification of the parties responsible for preparation, review, approval, and action on each document.
  5. Commissioning Activities Schedule: Identification of Commissioning Activities, including Systems Functional Testing, the expected duration and predecessors for the activity.
  6. Pre-Functional Checklists: Preliminary Pre-Functional Checklists for equipment, components, subsystems, and systems to be commissioned. These Preliminary Pre-Functional Checklists provide guidance on the level of detailed information the Contractor shall include on the final submission.
  7. Systems Functional Performance Test Procedures: Preliminary step-by-step System Functional Performance Test Procedures to be used during Systems Functional Performance Testing. These Preliminary Systems Functional Performance procedures provide information on the level of testing rigor, and the level of Contractor support required during performance of system's testing.
- B. Final Commissioning Plan Submittal: Based on the Final Construction Documents and the Contractor's project team, the Commissioning Agent will prepare the Final Commissioning Plan as described in this section. The Commissioning Agent will submit three hard copies and three sets of electronic files of Final Commissioning Plan. The Contractor shall review the Commissioning Plan and provide any comments to the VA. The Commissioning Agent will incorporate review comments into the Final Commissioning Plan as directed by the VA.
- C. Systems Functional Performance Test Procedure: The Commissioning Agent will submit preliminary Systems Functional Performance Test Procedures to the Contractor, and the VA for review and comment. The Contractor shall return review comments to the VA and the Commissioning Agent. The VA will also return review comments to the Commissioning Agent. The Commissioning Agent will incorporate review comments into the Final Systems Functional Test Procedures to be used in Systems Functional Performance Testing.
- D. Pre-Functional Checklists: The Commissioning Agent will submit Pre-Functional Checklists to be completed by the Contractor.
- E. Test and Inspection Reports: The Commissioning Agent will submit test and inspection reports to the VA with copies to the Contractor and the Architect/Engineer.
- F. Corrective Action Documents: The Commissioning Agent will submit corrective action documents to the VA Resident Engineer with copies to the Contractor and Architect.
- G. Preliminary Commissioning Report Submittal: The Commissioning Agent will submit three electronic copies of the preliminary commissioning report. One electronic copy, with review comments, will be returned to the Commissioning Agent for preparation of the final submittal.

- H. Final Commissioning Report Submittal: The Commissioning Agent will submit four sets of electronically formatted information of the final commissioning report to the VA. The final submittal will incorporate comments as directed by the VA.
- I. Data for Commissioning:
  - 1. The Commissioning Agent will request in writing from the Contractor specific information needed about each piece of commissioned equipment or system to fulfill requirements of the Commissioning Plan.
  - 2. The Commissioning Agent may request further documentation as is necessary for the commissioning process or to support other VA data collection requirements, including Construction Operations Building Information Exchange (COBIE), Building Information Modeling (BIM), etc.

#### **1.14 COMMISSIONING PROCESS**

- A. The Commissioning Agent will be responsible for the overall management of the commissioning process as well as coordinating scheduling of commissioning tasks with the VA and the Contractor. As directed by the VA, the Contractor shall incorporate Commissioning tasks, including, but not limited to, Systems Functional Performance Testing (including predecessors) with the Master Construction Schedule.
- B. Within 15 days of contract award, the Contractor shall designate a specific individual as the Commissioning Manager (CxM) to manage and lead the commissioning effort on behalf of the Contractor. The Commissioning Manager shall be the single point of contact and communications for all commissioning related services by the Contractor.
- C. Within 15 days of contract award, the Contractor shall ensure that each subcontractor designates specific individuals as Commissioning Representatives (CXR) to be responsible for commissioning related tasks. The Contractor shall ensure the designated Commissioning Representatives participate in the commissioning process as team members providing commissioning testing services, equipment operation, adjustments, and corrections if necessary. The Contractor shall ensure that all Commissioning Representatives shall have sufficient authority to direct their respective staff to provide the services required, and to speak on behalf of their organizations in all commissioning related contractual matters.

#### **1.15 QUALITY ASSURANCE**

- A. Instructor Qualifications: Factory authorized service representatives shall be experienced in training, operation, and maintenance procedures for installed systems, subsystems, and equipment.
- B. Test Equipment Calibration: The Contractor shall comply with test equipment manufacturer's calibration procedures and intervals. Recalibrate test instruments immediately whenever instruments have been repaired following damage or dropping. Affix calibration tags to test instruments. Instruments shall have been calibrated within six months prior to use.

#### **1.16 COORDINATION**

- A. Management: The Commissioning Agent will coordinate the commissioning activities with the VA and Contractor. The Commissioning Agent will submit commissioning documents and information to the VA. All commissioning team members shall work together to fulfill their contracted responsibilities and meet the objectives of the contract documents.
- B. Scheduling: The Contractor shall work with the Commissioning Agent and the VA to incorporate the commissioning activities into the construction schedule. The Commissioning Agent will provide sufficient information (including, but not limited to, tasks, durations and predecessors) on commissioning activities to allow the Contractor and the VA to schedule commissioning activities. All parties shall address scheduling issues and make necessary notifications in a timely manner in order to expedite the project and the commissioning process. The Contractor shall update the Master Construction as directed by the VA.

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

## **PART 2 - PRODUCTS**

### **2.1 TEST EQUIPMENT**

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

**PART 1 - EXECUTION**

**1.1 COMMISSIONING PROCESS ROLES AND RESPONSIBILITIES**

A. The following table outlines the roles and responsibilities for the Commissioning Team members during the Construction Phase:

Construction Phase		CxA = Commissioning Agent RE = Resident Engineer A/E = Design Arch/Engineer PC = Prime Contractor O&M = Gov't Facility O&M					L = Lead P = Participate A = Approve R = Review O = Optional
Commissioning Roles & Responsibilities							
Category	Task Description	CxA	RE	A/E	PC	O&M	Notes
Meetings	Construction Commissioning Kick Off meeting	L	A	P	P	O	
	Commissioning Meetings	L	A	P	P	O	
	Project Progress Meetings	P	A	P	L	O	
	Controls Meeting	L	A	P	P	O	
Coordination	Coordinate with [OGC's, AHJ, Vendors, etc.] to ensure that Cx interacts properly with other systems as needed to support the OPR and BOD.	L	A	P	P	N/A	
Cx Plan & Spec	Final Commissioning Plan	L	A	R	R	O	
Schedules	Duration Schedule for Commissioning Activities	L	A	R	R	N/A	
OPR and BOD	Maintain OPR on behalf of Owner	L	A	R	R	O	
	Maintain BOD/DID on behalf of Owner	L	A	R	R	O	

General Commissioning Requirements

<b>Construction Phase</b>		CxA = Commissioning Agent RE = Resident Engineer A/E = Design Arch/Engineer PC = Prime Contractor O&M = Gov't Facility O&M					L = Lead P = Participate A = Approve R = Review O = Optional
Commissioning Roles & Responsibilities							
Category	Task Description	CxA	RE	A/E	PC	O&M	Notes
Document Reviews	TAB Plan Review	L	A	R	R	O	
	Submittal and Shop Drawing Review	R	A	R	L	O	
	Review Contractor Equipment Startup Checklists	L	A	R	R	N/A	
	Review Change Orders, ASI, and RFI	L	A	R	R	N/A	
Site Observations	Witness Factory Testing	P	A	P	L	O	
	Construction Observation Site Visits	L	A	R	R	O	
Functional Test Protocols	Final Pre-Functional Checklists	L	A	R	R	O	
	Final Functional Performance Test Protocols	L	A	R	R	O	
Technical Activities	Issues Resolution Meetings	P	A	P	L	O	
Reports and Logs	Status Reports	L	A	R	R	O	
	Maintain Commissioning Issues Log	L	A	R	R	O	

B. The following table outlines the roles and responsibilities for the Commissioning Team members during the Acceptance Phase:

Acceptance Phase		CxA = Commissioning Agent RE = Resident Engineer A/E = Design Arch/Engineer PC = Prime Contractor O&M = Gov't Facility O&M					L = Lead P = Participate A = Approve R = Review O = Optional	
Commissioning Roles & Responsibilities								
Category	Task Description	CxA	RE	A/E	PC	O&M	Notes	
Meetings	Commissioning Meetings	L	A	P	P	O		
	Project Progress Meetings	P	A	P	L	O		
	Pre-Test Coordination Meeting	L	A	P	P	O		
	Lessons Learned and Commissioning Report Review Meeting	L	A	P	P	O		
Coordination	Coordinate with [OGC's, AHJ, Vendors, etc.] to ensure that Cx interacts properly with other systems as needed to support OPR and BOD	L	P	P	P	O		
Cx Plan & Spec	Maintain/Update Commissioning Plan	L	A	R	R	O		
Schedules	Prepare Functional Test Schedule	L	A	R	R	O		
OPR and BOD	Maintain OPR on behalf of Owner	L	A	R	R	O		
	Maintain BOD/DID on behalf of Owner	L	A	R	R	O		
Document Reviews	Review Completed Pre-Functional Checklists	L	A	R	R	O		
	Pre-Functional Checklist Verification	L	A	R	R	O		
	Review Operations & Maintenance Manuals	L	A	R	R	R		
	Training Plan Review	L	A	R	R	R		
	Warranty Review	L	A	R	R	O		
	Review TAB Report	L	A	R	R	O		

Acceptance Phase		CxA = Commissioning Agent RE = Resident Engineer A/E = Design Arch/Engineer PC = Prime Contractor O&M = Gov't Facility O&M					L = Lead P = Participate A = Approve R = Review O = Optional
Commissioning Roles & Responsibilities							
Category	Task Description	CxA	RE	A/E	PC	O&M	Notes
Site Observations	Construction Observation Site Visits	L	A	R	R	O	
	Witness Selected Equipment Startup	L	A	R	R	O	
Functional Test Protocols	TAB Verification	L	A	R	R	O	
	Systems Functional Performance Testing	L	A	P	P	P	
	Retesting	L	A	P	P	P	
Technical Activities	Issues Resolution Meetings	P	A	P	L	O	
	Systems Training	L	S	R	P	P	
Reports and Logs	Status Reports	L	A	R	R	O	
	Maintain Commissioning Issues Log	L	A	R	R	O	
	Final Commissioning Report	L	A	R	R	R	
	Prepare Systems Manuals	L	A	R	R	R	

C. The following table outlines the roles and responsibilities for the Commissioning Team members during the Warranty Phase:

Warranty Phase		CxA = Commissioning Agent RE = Resident Engineer A/E = Design Arch/Engineer PC = Prime Contractor O&M = Gov't Facility O&M					L = Lead P = Participate A = Approve R = Review O = Optional
Commissioning Roles & Responsibilities							
Category	Task Description	CxA	RE	A/E	PC	O&M	Notes
Meetings	Post-Occupancy User Review Meeting	L	A	O	P	P	
Site Observations	Periodic Site Visits	L	A	O	O	P	

Warranty Phase		CxA = Commissioning Agent RE = Resident Engineer A/E = Design Arch/Engineer PC = Prime Contractor O&M = Gov't Facility O&M					L = Lead P = Participate A = Approve R = Review O = Optional	
Commissioning Roles & Responsibilities								
Category	Task Description	CxA	RE	A/E	PC	O&M	Notes	
Functional Test Protocols	Deferred and/or seasonal Testing	L	A	O	P	P		
Technical Activities	Issues Resolution Meetings	L	S	O	O	P		
	Post-Occupancy Warranty Checkup and review of Significant Outstanding Issues	L	A		R	P		
Reports and Logs	Final Commissioning Report Amendment	L	A		R	R		
	Status Reports	L	A		R	R		

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

- A. The following procedures shall apply to all equipment and systems to be commissioned, according to Part 1, Systems to Be Commissioned.
1. Pre-Functional Checklists are important to ensure that the equipment and systems are hooked up and operational. These ensure that Systems Functional Performance Testing may proceed without unnecessary delays. Each system to be commissioned shall have a full Pre-Functional Checklist completed by the Contractor prior to Systems Functional Performance Testing. No sampling strategies are used.
    - a. The Pre-Functional Checklist will identify the trades responsible for completing the checklist. The Contractor shall ensure the appropriate trades complete the checklists.
    - b. The Commissioning Agent will review completed Pre-Functional Checklists and field-verify the accuracy of the completed checklist using sampling techniques.
  2. Startup and Initial Checkout Plan: The Contractor shall develop detailed startup plans for all equipment. The primary role of the Contractor in this process is to ensure that there is written documentation that each of the manufacturer recommended procedures have been completed. Parties responsible for startup shall be identified in the Startup Plan and in the checklist forms.
    - a. The Contractor shall develop the full startup plan by combining (or adding to) the checklists with the manufacturer's detailed startup and checkout procedures from the O&M manual data and the field checkout sheets normally used by the Contractor. The plan shall include checklists and procedures with specific boxes or lines for recording and documenting the checking and inspections of each procedure and a summary statement with a signature block at the end of the plan.
    - b. The full startup plan shall at a minimum consist of the following items:
      - 1) The Pre-Functional Checklists.
      - 2) The manufacturer's standard written startup procedures copied from the installation manuals with check boxes by each procedure and a signature block added by hand at the end.
      - 3) The manufacturer's normally used field checkout sheets.
    - c. The Commissioning Agent will submit the full startup plan to the VA and Contractor for review. Final approval will be by the VA.
    - d. The Contractor shall review and evaluate the procedures and the format for documenting them, noting any procedures that need to be revised or added.
  3. Sensor and Actuator Calibration
    - a. All field installed temperature, relative humidity, CO2 and pressure sensors and gages, and all actuators (dampers and valves) on all equipment shall be calibrated using the methods described in Division 21, Division 22, Division 23, Division 26, Division 27, and Division 28 specifications.
    - b. All procedures used shall be fully documented on the Pre-Functional Checklists or other suitable forms, clearly referencing the procedures followed and written documentation of initial, intermediate and final results.
  4. Execution of Equipment Startup
    - a. [Four][insert number] weeks prior to equipment startup, the Contractor shall schedule startup and checkout with the VA and Commissioning Agent. The performance of the startup and checkout shall be directed and executed by the Contractor.
    - b. The Commissioning Agent will observe the startup procedures for selected pieces of primary equipment.
    - c. The Contractor shall execute startup and provide the VA and Commissioning Agent with a signed and dated copy of the completed startup checklists, and contractor tests.

- d. Only individuals that have direct knowledge and witnessed that a line item task on the Startup Checklist was actually performed shall initial or check that item off. It is not acceptable for witnessing supervisors to fill out these forms.

## **1.2 DEFICIENCIES, NONCONFORMANCE, AND APPROVAL IN CHECKLISTS AND STARTUP**

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

## **1.3 PHASED COMMISSIONING**

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

## **1.4 DDC SYSTEM TRENDING FOR COMMISSIONING**

- A. Trending is a method of testing as a standalone method or to augment manual testing. The Contractor shall trend any and all points of the system or systems at intervals specified below.
- B. Alarms are a means to notify the system operator that abnormal conditions are present in the system. Alarms shall be structured into three tiers – Critical, Priority, and Maintenance.
  - 1. Critical alarms are intended to be alarms that require the immediate attention of and action by the Operator. These alarms shall be displayed on the Operator Workstation in a popup style window that is graphically linked to the associated unit's graphical display. The popup style window shall be displayed on top of any active window within the screen, including non DDC system software.
  - 2. Priority level alarms are to be printed to a printer which is connected to the Operator's Work Station located within the engineer's office. Additionally Priority level alarms shall be able to be monitored and viewed through an active alarm application. Priority level alarms are alarms which shall require reaction from the operator or maintenance personnel within a normal work shift, and not immediate action.
  - 3. Maintenance alarms are intended to be minor issues which would require examination by maintenance personnel within the following shift. These alarms shall be generated in a scheduled report automatically by the DDC system at the start of each shift. The generated maintenance report will be printed to a printer located within the engineer's office.
- C. The Contractor shall provide a wireless internet network in the building for use during controls programming, checkout, and commissioning. This network will allow project team members to more effectively program, view, manipulate and test control devices while being in the same room as the controlled device.

- D. The Contractor shall provide graphical trending through the DDC control system of systems being commissioned. Trending requirements are indicated below and included with the Systems Functional Performance Test Procedures. Trending shall occur before, during and after Systems Functional Performance Testing. The Contractor shall be responsible for producing graphical representations of the trended DDC points that show each system operating properly during steady state conditions as well as during the System Functional Testing. These graphical reports shall be submitted to the Resident Engineer and Commissioning Agent for review and analysis before, during dynamic operation, and after Systems Functional Performance Testing. The Contractor shall provide, but not limited to, the following trend requirements and trend submissions:
1. Pre-testing, Testing, and Post-testing – Trend reports of trend logs and graphical trend plots are required as defined by the Commissioning Agent. The trend log points, sampling rate, graphical plot configuration, and duration will be dictated by the Commissioning Agent. At any time during the Commissioning Process the Commissioning Agent may recommend changes to aspects of trending as deemed necessary for proper system analysis. The Contractor shall implement any changes as directed by the Resident Engineer. Any pre-test trend analysis comments generated by the Commissioning Team should be addressed and resolved by the Contractor, as directed by the Resident Engineer, prior to the execution of Systems Functional Performance Testing.
  2. Dynamic plotting – The Contractor shall also provide dynamic plotting during Systems Functional Performance testing at frequent intervals for points determined by the Systems Functional Performance Test Procedure. The graphical plots will be formatted and plotted at durations listed in the Systems Functional Performance Test Procedure.
  3. Graphical plotting - The graphical plots shall be provided with a dual y-axis allowing 15 or more trend points (series) plotted simultaneously on the graph with each series in distinct color. The plots will further require title, axis naming, legend etc. all described by the Systems Functional Performance Test Procedure. If this cannot be sufficiently accomplished directly in the Direct Digital Control System then it is the responsibility of the Contractor to plot these trend logs in Microsoft Excel.
  4. The following tables indicate the points to be trended and alarmed by system. The Operational Trend Duration column indicates the trend duration for normal operations. The Testing Trend Duration column indicates the trend duration prior to Systems Functional Performance Testing and again after Systems Functional Performance Testing. The Type column indicates point type: AI = Analog Input, AO = Analog Output, DI = Digital Input, DO = Digital Output, Calc = Calculated Point. In the Trend Interval Column, COV = Change of Value. The Alarm Type indicates the alarm priority; C = Critical, P = Priority, and M = Maintenance. The Alarm Range column indicates when the point is considered in the alarm state. The Alarm Delay column indicates the length of time the point must remain in an alarm state before the alarm is recorded in the DDC. The intent is to allow minor, short-duration events to be corrected by the DDC system prior to recording an alarm.
  - 5.

<b>Dual-Path Air Handling Unit Trending and Alarms</b>							
<b>Point</b>	<b>Type</b>	<b>Trend Interval</b>	<b>Operational Trend Duration</b>	<b>Testing Trend Duration</b>	<b>Alarm Type</b>	<b>Alarm Range</b>	<b>Alarm Delay</b>
OA Temperature	AI	15 Min	24 hours	3 days	N/A		
RA Temperature	AI	15 Min	24 hours	3 days	N/A		
RA Humidity	AI	15 Min	24 hours	3 days	P	>60% RH	10 min
Mixed Air Temp	AI	None	None	None	N/A		

Dual-Path Air Handling Unit Trending and Alarms							
Point	Type	Trend Interval	Operational Trend Duration	Testing Trend Duration	Alarm Type	Alarm Range	Alarm Delay
SA Temp	AI	15 Min	24 hours	3 days	C	±5°F from SP	10 min
Supply Fan Speed	AI	15 Min	24 hours	3 days	N/A		
Return Fan Speed	AI	15 Min	24 hours	3 days	N/A		
RA Pre-Filter Status	AI	None	None	None	N/A		
OA Pre-Filter Status	AI	None	None	None	N/A		
After Filter Status	AI	None	None	None	N/A		
SA Flow	AI	15 Min	24 hours	3 days	C	±10% from SP	10 min
OA Supply Temp	AI	15 Min	24 hours	3 days	P	±5°F from SP	10 min
RA Supply Temp	AI	15 Min	24 hours	3 days	N/A		
RA CHW Valve Position	AI	15 Min	24 hours	3 days	N/A		
OA CHW Valve Position	AI	15 Min	24 hours	3 days	N/A		
OA HW Valve Position	AI	15 Min	24 hours	3 days	N/A		
OA Flow	AI	15 Min	24 hours	3 days	P	±10% from SP	5 min
RA Flow	AI	15 Min	24 hours	3 days	P	±10% from SP	5 min
Initial UVC Intensity (%)	AI	None	None	None	N/A		
Duct Pressure	AI	15 Min	24 hours	3 days	C	±25% from SP	6 min
CO2 Level	AI	15 Min	24 hours	3 days	P	±10% from SP	10 min
Supply Fan Status	DI	COV	24 hours	3 days	C	Status <> Command	10 min
Return Fan Status	DI	COV	24 hours	3 days	C	Status <> Command	10 Min
High Static Status	DI	COV	24 hours	3 days	P	True	1 min
Fire Alarm Status	DI	COV	24 hours	3 days	C	True	5 min
Freeze Stat Level 1	DI	COV	24 hours	3 days	C	True	10 min
Freeze Stat Level 2	DI	COV	24 hours	3 days	C	True	5 min
Freeze Stat Level 3	DI	COV	24 hours	3 days	P	True	1 min
Fire/Smoke Damper Status	DI	COV	24 hours	3 days	P	Closed	1 min

General Commissioning Requirements

Dual-Path Air Handling Unit Trending and Alarms							
Point	Type	Trend Interval	Operational Trend Duration	Testing Trend Duration	Alarm Type	Alarm Range	Alarm Delay
Emergency AHU Shutdown	DI	COV	24 hours	3 days	P	True	1 min
Exhaust Fan #1 Status	DI	COV	24 hours	3 days	C	Status <> Command	10 min
Exhaust Fan #2 Status	DI	COV	24 hours	3 days	C	Status <> Command	10 min
Exhaust Fan #3 Status	DI	COV	24 hours	3 days	C	Status <> Command	10 min
OA Alarm	DI	COV	24 hours	3 days	C	True	10 min
High Static Alarm	DI	COV	24 hours	3 days	C	True	10 min
UVC Emitter Alarm	DI	COV	24 hours	3 days	P	True	10 min
CO2 Alarm	DI	COV	24 hours	3 days	P	True	10 min
Power Failure	DI	COV	24 hours	3 days	P	True	1 min
Supply Fan Speed	AO	15 Min	24 hours	3 days	N/A		
Return Fan Speed	AO	15 Min	24 hours	3 days	N/A		
RA CHW Valve Position	AO	15 Min	24 hours	3 days	N/A		
OA CHW Valve Position	AO	15 Min	24 hours	3 days	N/A		
OA HW Valve Position	AO	15 Min	24 hours	3 days	N/A		
Supply Fan S/S	DO	COV	24 hours	3 days	N/A		
Return Fan S/S	DO	COV	24 hours	3 days	N/A		
Fire/Smoke Dampers	DO	COV	24 hours	3 days	N/A		
Exhaust Fan S/S	DO	COV	24 hours	3 days	N/A		
Exhaust Fan S/S	DO	COV	24 hours	3 days	N/A		
Exhaust Fan S/S	DO	COV	24 hours	3 days	N/A		
AHU Energy	Calc	1 Hour	30 day	N/A	N/A		

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Terminal Unit (VAV, CAV, etc.) Trending and Alarms							
Point	Type	Trend Interval	Operational Trend Duration	Testing Trend Duration	Alarm Type	Alarm Range	Alarm Delay

**Terminal Unit (VAV, CAV, etc.) Trending and Alarms**

Point	Type	Trend Interval	Operational Trend Duration	Testing Trend Duration	Alarm Type	Alarm Range	Alarm Delay
Space Temperature	AI	15 Min	12 hours	3 days	P	±5°F from SP	10 min
Air Flow	AI	15 Min	12 hours	3 days	P	±5°F from SP	10 min
SA Temperature	AI	15 Min	12 hours	3 days	P	±5°F from SP	10 min
Local Setpoint	AI	15 Min	12 hours	3 days	M	±10°F from SP	60 min
Space Humidity	AI	15 Min	12 hours	3 days	P	> 60% RH	5 min
Unoccupied Override	DI	COV	12 hours	3 days	M	N/A	12 Hours
Refrigerator Alarm	DI	COV	12 hours	3 days	C	N/A	10 min
Damper Position	AO	15 Minutes	12 hours	3 days	N/A		
Heating coil Valve Position	AO	15 Minutes	12 hours	3 days	N/A		

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**4-Pipe Fan Coil Trending and Alarms**

Point	Type	Trend Interval	Operational Trend Duration	Testing Trend Duration	Alarm Type	Alarm Range	Alarm Delay
Space Temperature	AI	15 Minutes	12 hours	3 days	P	±5°F from SP	10 min
SA Temperature	AI	15 Minutes	12 hours	3 days	P	±5°F from SP	10 min
Pre-Filter Status	AI	None	None	None	M	> SP	1 hour
Water Sensor	DI	COV	12 hours	3 days	M	N/A	30 Min
Cooling Coil Valve Position	AO	15 Minutes	12 hours	3 days	N/A		
Heating coil Valve Position	AO	15 Minutes	12 hours	3 days	N/A		
Fan Coil ON/OFF	DO	COV	12 hours	3 days	M	Status <> Command	30 min

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**2-Pipe Fan Coil Unit Trending and Alarms**

Point	Type	Trend Interval	Operational Trend Duration	Testing Trend Duration	Alarm Type	Alarm Range	Alarm Delay
Space Temperature	AI	15 Minutes	12 hours	3 days	P	±5°F from SP	10 min
SA Temperature	AI	15 Minutes	12 hours	3 days	P	±5°F from SP	10 min
Pre-Filter Status	AI	None	None	None	M	> SP	1 hour
Water Sensor	DI	COV	12 hours	3 days	M	N/A	30 Min
Cooling Coil Valve Position	AO	15 Minutes	12 hours	3 days	N/A		
Fan Coil ON/OFF	DO	COV	12 hours	3 days	M	Status <> Command	30 min

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**Unit Heater Trending and Alarms**

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

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**Steam and Condensate Pumps Trending and Alarms**

Point	Type	Trend Interval	Operational Trend Duration	Testing Trend Duration	Alarm Type	Alarm Range	Alarm Delay
Steam Flow (LB/HR)	AI	15 Minutes	12 hours	3 days	N/A		
Condensate Pump Run Hours	AI	15 Minutes	12 hours	3 days	N/A		
Water Meter (GPM)	AI	15 Minutes	12 hours	3 days	N/A		
Electric Meter (KW/H)	AI	15 Minutes	12 hours	3 days	N/A		
Irrigation Meter (GPM)	AI	15 Minutes	12 hours	3 days	N/A		

**Steam and Condensate Pumps Trending and Alarms**

Point	Type	Trend Interval	Operational Trend Duration	Testing Trend Duration	Alarm Type	Alarm Range	Alarm Delay
Chilled Water Flow (TONS)	AI	15 Minutes	12 hours	3 days	N/A		
Condensate Flow (GPM)	AI	15 Minutes	12 hours	3 days	N/A		
High Water Level Alarm	DI	COV	12 hours	3 days	C	True	5 Min
Condensate Pump Start/Stop	DO	COV	12 hours	3 days	P	Status <> Command	10 min

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**Domestic Hot Water Trending and Alarms**

Point	Type	Trend Interval	Operational Trend Duration	Testing Trend Duration	Alarm Type	Alarm Range	Alarm Delay
Domestic HW Setpoint WH-1	AI	15 Minute	12 Hours	3 days	N/A		
Domestic HW Setpoint WH-2	AI	15 Minute	12 Hours	3 days	N/A		
Domestic HW Temperature	AI	15 Minute	12 Hours	3 days	C	> 135 oF	10 Min
Domestic HW Temperature	AI	15 Minute	12 Hours	3 days	P	±5°F from SP	10 Min
Dom. Circ. Pump #1 Status	DI	COV	12 Hours	3 days	M	Status <> Command	30 min
Dom. Circ. Pump #2 Status	DI	COV	12 Hours	3 days	M	Status <> Command	30 min
Dom. Circ. Pump #1 Start/Stop	DO	COV	12 Hours	3 days	N/A		
Dom. Circ. Pump #2 Start/Stop	DO	COV	12 Hours	3 days	N/A		
Domestic HW Start/Stop	DO	COV	12 Hours	3 days	N/A		

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**Hydronic Hot Water Trending and Alarms**

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

General Commissioning Requirements

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Chilled Water System Trending and Alarms							
Point	Type	Trend Interval	Operational Trend Duration	Testing Trend Duration	Alarm Type	Alarm Range	Alarm Delay
Chiller 1 Entering Temperature	AI	15 Minutes	12 Hours	3 days	N/A		
Chiller 1 Leaving Temperature	AI	15 Minutes	12 Hours	3 days	P	±5°F from SP	10 Min
Chiller 1 Flow	AI	15 Minutes	12 Hours	3 days	N/A		
Chiller 1 Percent Load	AI	15 Minutes	12 Hours	3 days	N/A		
Chiller 1 KW Consumption	AI	15 Minutes	12 Hours	3 days	N/A		
Chiller 1 Tonnage	AI	15 Minutes	12 Hours	3 days	N/A		
Chiller 2 Entering Temperature	AI	15 Minutes	12 Hours	3 days	N/A		
Chiller 2 Leaving Temperature	AI	15 Minutes	12 Hours	3 days	P	±5°F from SP	10 Min
Chiller 2 Flow	AI	15 Minutes	12 Hours	3 days	N/A		
Chiller 2 Percent Load	AI	15 Minutes	12 Hours	3 days	N/A		
Chiller 2 KW Consumption	AI	15 Minutes	12 Hours	3 days	N/A		
Chiller 2 Tonnage	AI	15 Minutes	12 Hours	3 days	N/A		
Primary Loop Decoupler Flow	AI	15 Minutes	12 Hours	3 days	N/A		
Primary Loop Flow	AI	15 Minutes	12 Hours	3 days	N/A		
Primary Loop Supply Temperature	AI	15 Minutes	12 Hours	3 days	N/A		
Secondary Loop Differential Pressure	AI	15 Minutes	12 Hours	3 days	P	±5% from SP	10 Min
Secondary Loop Flow	AI	15 Minutes	12 Hours	3 days	N/A		
Secondary Loop Supply Temperature	AI	15 Minutes	12 Hours	3 days	N/A		
Secondary Loop Return Temperature	AI	15 Minutes	12 Hours	3 days	N/A		
Secondary Loop Tonnage	AI	15 Minutes	12 Hours	3 days	N/A		

Chilled Water System Trending and Alarms							
Point	Type	Trend Interval	Operational Trend Duration	Testing Trend Duration	Alarm Type	Alarm Range	Alarm Delay
Primary Loop Pump 1 Status	DI	COV	12 Hours	3 days	C	Status <> Command	30 min
Primary Loop Pump 2 Status	DI	COV	12 Hours	3 days	C	Status <> Command	30 min
Secondary Loop Pump 1 Status	DI	COV	12 Hours	3 days	C	Status <> Command	30 min
Secondary Loop Pump 2 Status	DI	COV	12 Hours	3 days	C	Status <> Command	30 min
Chiller 1 Status	DI	COV	12 Hours	3 days	C	Status <> Command	30 min
Chiller 1 Evaporator Iso-Valve	DI	COV	12 Hours	3 days	N/A		
Chiller 1 Evaporator Flow Switch	DI	COV	12 Hours	3 days	N/A		
Chiller 1 Unit Alarm	DI	COV	12 Hours	3 days	C	True	10 Min
Chiller 2 Status	DI	COV	12 Hours	3 days	C	Status <> Command	30 min
Chiller 2 Evaporator Iso-Valve	DI	COV	12 Hours	3 days	N/A		
Chiller 2 Evaporator Flow Switch	DI	COV	12 Hours	3 days	N/A		
Chiller 2 Unit Alarm	DI	COV	12 Hours	3 days	C	True	10 Min
Refrigerant Detector	DI	COV	12 Hours	3 days	C	True	10 Min
Refrigerant Exhaust Fan Status	DI	COV	12 Hours	3 days	M	Status <> Command	30 min
Emergency Shutdown	DI	COV	12 Hours	3 days	P	True	1 Min
Primary Loop Pump 1 VFD Speed	AO	15 Minutes	12 Hours	3 days	N/A		
Primary Loop Pump 2 VFD Speed	AO	15 Minutes	12 Hours	3 days	N/A		
Secondary Loop Pump 1 VFD Speed	AO	15 Minutes	12 Hours	3 days	N/A		
Secondary Loop Pump 2 VFD Speed	AO	15 Minutes	12 Hours	3 days	N/A		

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

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Condenser Water System Trending and Alarms							
Point	Type	Trend Interval	Operational Trend Duration	Testing Trend Duration	Alarm Type	Alarm Range	Alarm Delay
Chiller 1 Condenser Entering Temp	AI	15 Minutes	12 Hours	3 days	N/A		
Chiller 1 Condenser Leaving Temp	AI	15 Minutes	12 Hours	3 days	N/A		
Chiller 2 Condenser Entering Temp	AI	15 Minutes	12 Hours	3 days	N/A		
Chiller 2 Condenser Leaving Temp	AI	15 Minutes	12 Hours	3 days	N/A		
Cooling Tower 1 Supply Temp	AI	15 Minutes	12 Hours	3 days	N/A		
Cooling Tower 1 Return Temp	AI	15 Minutes	12 Hours	3 days	N/A		
Cooling Tower 1 Basin Temp	AI	15 Minutes	12 Hours	3 days	P	< 45 oF	10 Min
Cooling Tower 2 Supply Temp	AI	15 Minutes	12 Hours	3 days	N/A		

Condenser Water System Trending and Alarms							
Point	Type	Trend Interval	Operational Trend Duration	Testing Trend Duration	Alarm Type	Alarm Range	Alarm Delay
Cooling Tower 2 Return Temp	AI	15 Minutes	12 Hours	3 days	N/A		
Cooling Tower 2 Basin Temp	AI	15 Minutes	12 Hours	3 days	P	< 45 oF	10 Min
Condenser Water Supply Temp	AI	15 Minutes	12 Hours	3 days	N/A		
Condenser Water Return Temp	AI	15 Minutes	12 Hours	3 days	N/A		
Outdoor Air Wet Bulb	AI	15 Minutes	12 Hours	3 days	N/A		
Cooling Tower 1 Fan Status	DI	COV	12 Hours	3 days	P	Status <> Command	1 min
Cooling Tower 1 Basin Heat	DI	COV	12 Hours	3 days	N/A		
Cooling Tower 1 Heat Trace	DI	COV	12 Hours	3 days	N/A		
Cooling Tower 2 Fan Status	DI	COV	12 Hours	3 days	P	Status <> Command	1 min
Cooling Tower 2 Basin Heat	DI	COV	12 Hours	3 days	N/A		
Cooling Tower 2 Heat Trace	DI	COV	12 Hours	3 days	N/A		
Chiller 1 Isolation Valve	DI	COV	12 Hours	3 days	P	Status <> Command	1 min
Chiller 2 Isolation Valve	DI	COV	12 Hours	3 days	P	Status <> Command	1 min
Condenser Water Pump 1 Status	DI	COV	12 Hours	3 days	P	Status <> Command	1 min
Condenser Water Pump 2 Status	DI	COV	12 Hours	3 days	P	Status <> Command	1 min
Chiller 1 Condenser Bypass Valve	AO	15 Minutes	12 Hours	3 days	N/A		
Chiller 2 Condenser By-Pass Valve	AO	15 Minutes	12 Hours	3 days	N/A		
Cooling Tower 1 Bypass Valve	AO	15 Minutes	12 Hours	3 days	N/A		
Cooling Tower 1 Fan Speed	AO	15 Minutes	12 Hours	3 days	N/A		
Cooling Tower 2 Bypass Valve	AO	15 Minutes	12 Hours	3 days	N/A		
Cooling Tower 2 Fan Speed	AO	15 Minutes	12 Hours	3 days	N/A		

Condenser Water System Trending and Alarms							
Point	Type	Trend Interval	Operational Trend Duration	Testing Trend Duration	Alarm Type	Alarm Range	Alarm Delay
Cooling Tower 1 Fan Start / Stop	DO	COV	12 Hours	3 days	N/A		
Cooling Tower 2 Fan Start / Stop	DO	COV	12 Hours	3 days	N/A		
Condenser Water Pump 1 Start / Stop	DO	COV	12 Hours	3 days	N/A		
Condenser Water Pump 2 Start / Stop	DO	COV	12 Hours	3 days	N/A		

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Steam Boiler System Trending and Alarms							
Point	Type	Trend Interval	Operational Trend Duration	Testing Trend Duration	Alarm Type	Alarm Range	Alarm Delay
Boiler 1 Steam Pressure	AI	15 Minutes	12 Hours	3 days	P	±5% from SP	10 Min
Boiler 1 Steam Temperature	AI	15 Minutes	12 Hours	3 days	N/A		
Boiler 1 Fire Signal	AI	15 Minutes	12 Hours	3 days	N/A		
Boiler 2 Steam Pressure	AI	15 Minutes	12 Hours	3 days	P	±5% from SP	10 Min
Boiler 2 Steam Temperature	AI	15 Minutes	12 Hours	3 days	N/A		
Boiler 2 Fire Signal	AI	15 Minutes	12 Hours	3 days	N/A		
System Steam Pressure	AI	15 Minutes	12 Hours	3 days	P	±5% from SP	10 Min
Boiler 1 Enable	DI	COV	12 Hours	3 days	N/A		
Boiler 1 Status	DI	COV	12 Hours	3 days	P	Status <> Command	10 min
Boiler 1 Alarm	DI	COV	12 Hours	3 days	C	True	1 Min
Boiler 1 on Fuel Oil	DI	COV	12 Hours	3 days	N/A		
Boiler 1 Low Water Alarm	DI	COV	12 Hours	3 days	C	True	5 Min
Boiler 1 High Water Alarm	DI	COV	12 Hours	3 days	C	True	5 Min
Boiler 1 Feed Pump	DI	COV	12 Hours	3 days	N/A		
Boiler 2 Enable	DI	COV	12 Hours	3 days	N/A		

Steam Boiler System Trending and Alarms							
Point	Type	Trend Interval	Operational Trend Duration	Testing Trend Duration	Alarm Type	Alarm Range	Alarm Delay
Boiler 2 Status	DI	COV	12 Hours	3 days	P	Status <> Command	10 min
Boiler 2 Alarm	DI	COV	12 Hours	3 days	C	True	1 Min
Boiler 2 on Fuel Oil	DI	COV	12 Hours	3 days	N/A		
Boiler 2 Low Water Alarm	DI	COV	12 Hours	3 days	C	True	5 Min
Boiler 2 High Water Alarm	DI	COV	12 Hours	3 days	C	True	5 Min
Boiler 2 Feed Pump	DI	COV	12 Hours	3 days	N/A		
Combustion Damper Status	DI	COV	12 Hours	3 days	P	Status <> Command	5 min
Condensate Recovery Pump Status	DI	COV	12 Hours	3 days	P	Status <> Command	5 min
Boiler 1 Feed Pump Start / Stop	DO	COV	12 Hours	3 days	N/A		
Boiler 2 Start / Stop	DO	COV	12 Hours	3 days	N/A		
Combustion Damper Command	DO	COV	12 Hours	3 days	N/A		
Condensate Recovery Pump Start / Stop	DO	COV	12 Hours	3 days	N/A		

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Hot Water Boiler System Trending and Alarms							
Point	Type	Trend Interval	Operational Trend Duration	Testing Trend Duration	Alarm Type	Alarm Range	Alarm Delay
Outside Air Temperature	AI	15 Minutes	12 Hours	3 days	N/A		
Boiler 1 Fire Signal	AI	15 Minutes	12 Hours	3 days	N/A		
Boiler 1 Entering Water Temperature	AI	15 Minutes	12 Hours	3 days	N/A		

Hot Water Boiler System Trending and Alarms							
Point	Type	Trend Interval	Operational Trend Duration	Testing Trend Duration	Alarm Type	Alarm Range	Alarm Delay
Boiler 1 Leaving Water Temperature	AI	15 Minutes	12 Hours	3 days	N/A		
Boiler 2 Fire Signal	AI	15 Minutes	12 Hours	3 days	N/A		
Boiler 2 Entering Water Temperature	AI	15 Minutes	12 Hours	3 days	N/A		
Boiler 2 Leaving Water Temperature	AI	15 Minutes	12 Hours	3 days	N/A		
Hot Water Supply Temperature	AI	15 Minutes	12 Hours	3 days	P	±5 oF from SP	10 Min
Hot Water Return Temperature	AI	15 Minutes	12 Hours	3 days	N/A		
Secondary Loop Differential Pressure	AI	15 Minutes	12 Hours	3 days	C	±5% from SP	10 Min
Lead Boiler	AI	15 Minutes	12 Hours	3 days	N/A		
Boiler 1 Enable	DI	COV	12 Hours	3 days	N/A		
Boiler 1 Status	DI	COV	12 Hours	3 days	P	Status <> Command	10 min
Boiler 1 Isolation Valve	DI	COV	12 Hours	3 days	N/A		
Boiler 1 on Fuel Oil	DI	COV	12 Hours	3 days	N/A		
Boiler 1 Alarm	DI	COV	12 Hours	3 days	C	True	1 Min
Boiler 2 Enable	DI	COV	12 Hours	3 days	N/A		
Boiler 2 Status	DI	COV	12 Hours	3 days	P	Status <> Command	10 min
Boiler 2 Isolation Valve	DI	COV	12 Hours	3 days	N/A		
Boiler 2 on Fuel Oil	DI	COV	12 Hours	3 days	N/A		
Boiler 2 Alarm	DI	COV	12 Hours	3 days	C	True	1 Min
Combustion Dampers Open	DI	COV	12 Hours	3 days	P	Status <> Command	10 min
Primary Pump 1 Status	DI	COV	12 Hours	3 days	P	Status <> Command	10 min
Primary Pump 2 Status	DI	COV	12 Hours	3 days	P	Status <> Command	10 min
Secondary Pump 1 Status	DI	COV	12 Hours	3 days	P	Status <> Command	10 min
Secondary Pump 2 Status	DI	COV	12 Hours	3 days	P	Status <> Command	10 min

Hot Water Boiler System Trending and Alarms							
Point	Type	Trend Interval	Operational Trend Duration	Testing Trend Duration	Alarm Type	Alarm Range	Alarm Delay
Primary Pump 1 VFD Speed	AO	COV	12 Hours	3 days	N/A		
Primary Pump 2 VFD Speed	AO	COV	12 Hours	3 days	N/A		
Secondary Pump 1 VFD Speed	AO	COV	12 Hours	3 days	N/A		
Secondary Pump 2 VFD Speed	AO	COV	12 Hours	3 days	N/A		
Hot Water System Enable	DO	COV	12 Hours	3 days	N/A		
Combustion Dampers Command	DO	COV	12 Hours	3 days	N/A		
Primary Pump 1 Start / Stop	DO	COV	12 Hours	3 days	N/A		
Primary Pump 2 Start / Stop	DO	COV	12 Hours	3 days	N/A		
Secondary Pump 1 Start / Stop	DO	COV	12 Hours	3 days	N/A		
Secondary Pump 2 Start / Stop	DO	COV	12 Hours	3 days	N/A		

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

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

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

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

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**1.5 SYSTEMS FUNCTIONAL PERFORMANCE TESTING**

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

11. Instructions for setting up the test.
  12. Special cautions, alarm limits, etc.
  13. Specific step-by-step procedures to execute the test, in a clear, sequential and repeatable format
  14. Acceptance criteria of proper performance with a Yes / No check box to allow for clearly marking whether or not proper performance of each part of the test was achieved.
  15. A section for comments.
  16. Signatures and date block for the Commissioning Agent. A place for the Contractor to initial to signify attendance at the test.
- E. Test Methods: Systems Functional Performance Testing shall be achieved by manual testing (i.e. persons manipulate the equipment and observe performance) and/or by monitoring the performance and analyzing the results using the control system's trend log capabilities or by standalone data loggers. The Contractor and Commissioning Agent shall determine which method is most appropriate for tests that do not have a method specified.
1. Simulated Conditions: Simulating conditions (not by an overwritten value) shall be allowed, although timing the testing to experience actual conditions is encouraged wherever practical.
  2. Overwritten Values: Overwriting sensor values to simulate a condition, such as overwriting the outside air temperature reading in a control system to be something other than it really is, shall be allowed, but shall be used with caution and avoided when possible. Such testing methods often can only test a part of a system, as the interactions and responses of other systems will be erroneous or not applicable. Simulating a condition is preferable. e.g., for the above case, by heating the outside air sensor with a hair blower rather than overwriting the value or by altering the appropriate setpoint to see the desired response. Before simulating conditions or overwriting values, sensors, transducers and devices shall have been calibrated.
  3. Simulated Signals: Using a signal generator which creates a simulated signal to test and calibrate transducers and DDC constants is generally recommended over using the sensor to act as the signal generator via simulated conditions or overwritten values.
  4. Altering Setpoints: Rather than overwriting sensor values, and when simulating conditions is difficult, altering setpoints to test a sequence is acceptable. For example, to see the Air Conditioning compressor lockout initiate at an outside air temperature below 12 C (54 F), when the outside air temperature is above 12 C (54 F), temporarily change the lockout setpoint to be 2 C (4 F) above the current outside air temperature.
  5. Indirect Indicators: Relying on indirect indicators for responses or performance shall be allowed only after visually and directly verifying and documenting, over the range of the tested parameters, that the indirect readings through the control system represent actual conditions and responses. Much of this verification shall be completed during systems startup and initial checkout.
- F. Setup: Each function and test shall be performed under conditions that simulate actual conditions as closely as is practically possible. The Contractor shall provide all necessary materials, system modifications, etc. to produce the necessary flows, pressures, temperatures, etc. necessary to execute the test according to the specified conditions. At completion of the test, the Contractor shall return all affected building equipment and systems, due to these temporary modifications, to their pretest condition.
- G. Sampling: No sampling is allowed in completing Pre-Functional Checklists. Sampling is allowed for Systems Functional Performance Test Procedures execution. The Commissioning Agent will determine the sampling rate. If at any point, frequent failures are occurring and testing is becoming more troubleshooting than verification, the Commissioning Agent may stop the testing and require the Contractor to perform and document a checkout of the remaining units, prior to continuing with Systems Functional Performance Testing of the remaining units.
- H. Cost of Retesting: The cost associated with expanded sample System Functional Performance Tests shall be solely the responsibility of the Contractor. Any required retesting by the

Contractor shall not be considered a justified reason for a claim of delay or for a time extension by the Contractor.

- I. **Coordination and Scheduling:** The Contractor shall provide a minimum of 7 days' notice to the Commissioning Agent and the VA regarding the completion schedule for the Pre-Functional Checklists and startup of all equipment and systems. The Commissioning Agent will schedule Systems Functional Performance Tests with the Contractor and VA. The Commissioning Agent will witness and document the Systems Functional Performance Testing of systems. The Contractor shall execute the tests in accordance with the Systems Functional Performance Test Procedure.
- J. **Testing Prerequisites:** In general, Systems Functional Performance Testing will be conducted only after Pre-Functional Checklists have been satisfactorily completed. The control system shall be sufficiently tested and approved by the Commissioning Agent and the VA before it is used to verify performance of other components or systems. The air balancing and water balancing shall be completed before Systems Functional Performance Testing of air-related or water-related equipment or systems are scheduled. Systems Functional Performance Testing will proceed from components to subsystems to systems. When the proper performance of all interacting individual systems has been achieved, the interface or coordinated responses between systems will be checked.
- K. **Problem Solving:** The Commissioning Agent will recommend solutions to problems found, however the burden of responsibility to solve, correct and retest problems is with the Contractor.

#### **1.6 DOCUMENTATION, NONCONFORMANCE AND APPROVAL OF TESTS**

- A. **Documentation:** The Commissioning Agent will witness, and document the results of all Systems Functional Performance Tests using the specific procedural forms developed by the Commissioning Agent for that purpose. Prior to testing, the Commissioning Agent will provide these forms to the VA and the Contractor for review and approval. The Contractor shall include the filled out forms with the O&M manual data.
- B. **Nonconformance:** The Commissioning Agent will record the results of the Systems Functional Performance Tests on the procedure or test form. All items of nonconformance issues will be noted and reported to the VA on Commissioning Field Reports and/or the Commissioning Master Issues Log.
  - 1. Corrections of minor items of noncompliance identified may be made during the tests. In such cases, the item of noncompliance and resolution shall be documented on the Systems Functional Test Procedure.
  - 2. Every effort shall be made to expedite the systems functional Performance Testing process and minimize unnecessary delays, while not compromising the integrity of the procedures. However, the Commissioning Agent shall not be pressured into overlooking noncompliant work or loosening acceptance criteria to satisfy scheduling or cost issues, unless there is an overriding reason to do so by direction from the VA.
  - 3. As the Systems Functional Performance Tests progresses and an item of noncompliance is identified, the Commissioning Agent shall discuss the issue with the Contractor and the VA.
  - 4. When there is no dispute on an item of noncompliance, and the Contractor accepts responsibility to correct it:
    - a. The Commissioning Agent will document the item of noncompliance and the Contractor's response and/or intentions. The Systems Functional Performance Test then continues or proceeds to another test or sequence. After the day's work is complete, the Commissioning Agent will submit a Commissioning Field Report to the VA. The Commissioning Agent will also note items of noncompliance and the Contractor's response in the Master Commissioning Issues Log. The Contractor shall correct the item of noncompliance and report completion to the VA and the Commissioning Agent.



condition or other conditions, execution of the Systems Functional Performance Testing may be delayed upon approval of the VA. These Systems Functional Performance Tests shall be conducted in the same manner as the seasonal tests as soon as possible. Services of the Contractor to conduct these unforeseen Deferred Systems Functional Performance Tests shall be negotiated between the VA and the Contractor.

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

## **1.8 OPERATION AND MAINTENANCE TRAINING REQUIREMENTS**

- A. **Training Preparation Conference:** Before operation and maintenance training, the Commissioning Agent will convene a training preparation conference to include VA's Resident Engineer, VA's Operations and Maintenance personnel, and the Contractor. The purpose of this conference will be to discuss and plan for Training and Demonstration of VA Operations and Maintenance personnel.
- B. The Contractor shall provide training and demonstration as required by other Division 21, Division 22, Division 23, Division 26, Division 27, Division 28, and Division 31 sections. The Training and Demonstration shall include, but is not limited to, the following:
  - 1. Review the Contract Documents.
  - 2. Review installed systems, subsystems, and equipment.
  - 3. Review instructor qualifications.
  - 4. Review instructional methods and procedures.
  - 5. Review training module outlines and contents.
  - 6. Review course materials (including operation and maintenance manuals).
  - 7. Review and discuss locations and other facilities required for instruction.
  - 8. Review and finalize training schedule and verify availability of educational materials, instructors, audiovisual equipment, and facilities needed to avoid delays.
  - 9. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.
- C. **Training Module Submittals:** The Contractor shall submit the following information to the VA and the Commissioning Agent:
  - 1. **Instruction Program:** Submit two copies of outline of instructional program for demonstration and training, including a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module. At completion of training, submit two complete training manuals for VA's use.
  - 2. **Qualification Data:** Submit qualifications for facilitator and/or instructor.
  - 3. **Attendance Record:** For each training module, submit list of participants and length of instruction time.
  - 4. **Evaluations:** For each participant and for each training module, submit results and documentation of performance-based test.
  - 5. **Demonstration and Training Recording:**
    - a. **General:** Engage a qualified commercial photographer to record demonstration and training. Record each training module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not

- student practice. At beginning of each training module, record each chart containing learning objective and lesson outline.
- b. Video Format: Provide high quality color DVD color on standard size DVD disks.
  - c. Recording: Mount camera on tripod before starting recording, unless otherwise necessary to show area of demonstration and training. Display continuous running time.
  - d. Narration: Describe scenes on video recording by audio narration by microphone while demonstration and training is recorded. Include description of items being viewed. Describe vantage point, indicating location, direction (by compass point), and elevation or story of construction.
  - e. Submit two copies within seven days of end of each training module.
6. Transcript: Prepared on 8-1/2-by-11-inch paper, punched and bound in heavy-duty, 3-ring, vinyl-covered binders. Mark appropriate identification on front and spine of each binder. Include a cover sheet with same label information as the corresponding videotape. Include name of Project and date of videotape on each page.
- D. Quality Assurance:
1. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.
  2. Instructor Qualifications: A factory authorized service representative, complying with requirements in Division 01 Section "Quality Requirements," experienced in operation and maintenance procedures and training.
  3. Photographer Qualifications: A professional photographer who is experienced photographing construction projects.
- E. Training Coordination:
1. Coordinate instruction schedule with VA's operations. Adjust schedule as required to minimize disrupting VA's operations.
  2. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.
  3. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by the VA.
- F. Instruction Program:
1. Program Structure: Develop an instruction program that includes individual training modules for each system and equipment not part of a system, as required by individual Specification Sections, and as follows:
    - a. Fire protection systems, including fire alarm, fire pumps, and fire suppression systems.
    - b. Intrusion detection systems.
    - c. Conveying systems, including elevators, wheelchair lifts, escalators, and automated materials handling systems.
    - d. Medical equipment, including medical gas equipment and piping.
    - e. Laboratory equipment, including laboratory air and vacuum equipment and piping.
    - f. Heat generation, including boilers, feedwater equipment, pumps, steam distribution piping, condensate return systems, heating hot water heat exchangers, and heating hot water distribution piping.
    - g. Refrigeration systems, including chillers, cooling towers, condensers, pumps, and distribution piping.
    - h. HVAC systems, including air handling equipment, air distribution systems, and terminal equipment and devices.
    - i. HVAC instrumentation and controls.

- j. Electrical service and distribution, including switchgear, transformers, switchboards, panelboards, uninterruptible power supplies, and motor controls.
  - k. Packaged engine generators, including synchronizing switchgear/switchboards, and transfer switches.
  - l. Lighting equipment and controls.
  - m. Communication systems, including intercommunication, surveillance, nurse call systems, public address, mass evacuation, voice and data, and entertainment television equipment.
  - n. Site utilities including lift stations, condensate pumping and return systems, and storm water pumping systems.
- G. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participants are expected to master. For each module, include instruction for the following:
- 1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
    - a. System, subsystem, and equipment descriptions.
    - b. Performance and design criteria if Contractor is delegated design responsibility.
    - c. Operating standards.
    - d. Regulatory requirements.
    - e. Equipment function.
    - f. Operating characteristics.
    - g. Limiting conditions.
    - h. Performance curves.
  - 2. Documentation: Review the following items in detail:
    - a. Emergency manuals.
    - b. Operations manuals.
    - c. Maintenance manuals.
    - d. Project Record Documents.
    - e. Identification systems.
    - f. Warranties and bonds.
    - g. Maintenance service agreements and similar continuing commitments.
  - 3. Emergencies: Include the following, as applicable:
    - a. Instructions on meaning of warnings, trouble indications, and error messages.
    - b. Instructions on stopping.
    - c. Shutdown instructions for each type of emergency.
    - d. Operating instructions for conditions outside of normal operating limits.
    - e. Sequences for electric or electronic systems.
    - f. Special operating instructions and procedures.
  - 4. Operations: Include the following, as applicable:
    - a. Startup procedures.
    - b. Equipment or system break-in procedures.
    - c. Routine and normal operating instructions.
    - d. Regulation and control procedures.
    - e. Control sequences.
    - f. Safety procedures.
    - g. Instructions on stopping.
    - h. Normal shutdown instructions.
    - i. Operating procedures for emergencies.
    - j. Operating procedures for system, subsystem, or equipment failure.
    - k. Seasonal and weekend operating instructions.
    - l. Required sequences for electric or electronic systems.
    - m. Special operating instructions and procedures.
  - 5. Adjustments: Include the following:
    - a. Alignments.
    - b. Checking adjustments.

- c. Noise and vibration adjustments.
    - d. Economy and efficiency adjustments.
  - 6. Troubleshooting: Include the following:
    - a. Diagnostic instructions.
    - b. Test and inspection procedures.
  - 7. Maintenance: Include the following:
    - a. Inspection procedures.
    - b. Types of cleaning agents to be used and methods of cleaning.
    - c. List of cleaning agents and methods of cleaning detrimental to product.
    - d. Procedures for routine cleaning
    - e. Procedures for preventive maintenance.
    - f. Procedures for routine maintenance.
    - g. Instruction on use of special tools.
  - 8. Repairs: Include the following:
    - a. Diagnosis instructions.
    - b. Repair instructions.
    - c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
    - d. Instructions for identifying parts and components.
    - e. Review of spare parts needed for operation and maintenance.
- H. Training Execution:
  - 1. Preparation: Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a combined training manual. Set up instructional equipment at instruction location.
  - 2. Instruction:
    - a. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and Department of Veterans Affairs for number of participants, instruction times, and location.
    - b. Instructor: Engage qualified instructors to instruct VA's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
      - 1) The Commissioning Agent will furnish an instructor to describe basis of system design, operational requirements, criteria, and regulatory requirements.
      - 2) The VA will furnish an instructor to describe VA's operational philosophy.
      - 3) The VA will furnish the Contractor with names and positions of participants.
  - 3. Scheduling: Provide instruction at mutually agreed times. For equipment that requires seasonal operation, provide similar instruction at start of each season. Schedule training with the VA and the Commissioning Agent with at least seven days' advance notice.
  - 4. Evaluation: At conclusion of each training module, assess and document each participant's mastery of module by use of an oral, or a written, performance-based test.
  - 5. Cleanup: Collect used and leftover educational materials and remove from Project site. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.
- I. Demonstration and Training Recording:
  - 1. General: Engage a qualified commercial photographer to record demonstration and training. Record each training module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice. At beginning of each training module, record each chart containing learning objective and lesson outline.
  - 2. Video Format: Provide high quality color DVD color on standard size DVD disks.
  - 3. Recording: Mount camera on tripod before starting recording, unless otherwise necessary to show area of demonstration and training. Display continuous running time.

4. Narration: Describe scenes on videotape by audio narration by microphone while demonstration and training is recorded. Include description of items being viewed. Describe vantage point, indicating location, direction (by compass point), and elevation or story of construction.

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