

CLEMENT J. ZABLOCKI VA MEDICAL CENTER
Building 111 Façade Repair
Specifications

500 W National Avenue
Milwaukee, WI 53295

VA Project No. 695-22-121

Issued for 100% Bid Documents – March 16, 2026

ALLIANCE
Alliance Consulting Group

SEVEN
GENERATIONS
ARCHITECTURE • ENGINEERING

Joint Venture

Prepared for:
Clement J Zablock VA Medical Center
5000 W National Avenue
Milwaukee, WI 53295
VA Project: 695-22-121

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**DEPARTMENT OF VETERANS AFFAIRS
VHA MASTER SPECIFICATIONS**

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Milwaukee VAMC
695-22-121 VAMKE Bldg 111 Façade Repair
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SECTION 00 01 15
LIST OF DRAWING SHEETS

The drawings listed below accompanying this specification form a part of
the contract.

<u>Drawing No.</u>	<u>Title</u>
G001	TITLE SHEET
G002	GENERAL INFO & SYMBOL LEGEND
G003	ROOF PLANS AND ISOMETRICS
G004	ROOF AND ELEVATOR ACCESS FLOORS 1 AND 3
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A300	ENLARGED ELEVATIONS
A301	WALL SECTIONS AND DETAILS
A302	REPAIR DETAILS
A303	REPAIR DETAILS
HA200	HAZARDOUS MATERIALS LOCATION PLAN ELEVATIONS 3 AND 1 (NORTH)
HA201	HAZARDOUS MATERIALS LOCATION PLAN ELEVATIONS 21 (SOUTH)
HA202	HAZARDOUS MATERIALS LOCATION PLAN ELEVATIONS 23 (SOUTH)
HA203	HAZARDOUS MATERIALS LOCATION PLAN ELEVATIONS 25 (SOUTH)
HA204	HAZARDOUS MATERIALS LOCATION PLAN ELEVATIONS 26 (WEST)

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SECTION 01 00 00
GENERAL REQUIREMENTS

1.1 SAFETY REQUIREMENTS

- A. Refer to Specification 01 35 26 for Safety and Infection Control requirements.

1.2 GENERAL INTENTION

- A. See included Scope of Work and Drawings.
- B. Visits to the site by Bidders may be made only as described in the solicitation in accordance with FAR 52.236-27 Site Visit (Construction).
- C. Contractor shall completely prepare site for building operations, including demolition and removal of existing structures, and furnish labor and materials and perform exterior renovation work for Clement J. Zablocki VA Medical Center - Repair the existing Precast Concrete panels as required by the contract drawings and specifications.
- D. Offices of Alliance|7 Generations JV (A7G), 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 their duly authorized representative.
- E. All employees of 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. Refer to Specification 01 01 10-SN for fingerprint, badging, construction door access and parking requirements.

1.3 STATEMENT OF BID ITEM(S) & SPECIFICATIONS AND DRAWINGS FOR THE CONTRACTOR

- A. Item 1, General Construction: Base Bid. Contractor shall provide all labor, equipment, materials, and supervision necessary to complete project 695-22-121, Repair Building 111 Concrete Façade at the Clement J. Zablocki VA Medical Center in Milwaukee, Wisconsin in accordance with the attached drawings and specifications. All work shall be completed in a first-class manner as approved by the COR.
- B. Drawings and specifications (contract documents) may be obtained from the SAM.gov website where the solicitation is posted. Hard copies will be the responsibility and expense of the Contractor(s).

C. Project location is Building 111 main hospital, exterior facades.

1. The work on each façade shall be during regular shift time. See the phasing/sequencing plan later in this specification and the drawings for details.

D. The scope of this project includes but is not limited to the following improvements:

1. This project will be the first of several phases to repair spalling concrete and cracks in the façade of Bldg 111, as well as to address vulnerabilities to water infiltration with the as-built exterior wall assembly. Refer to Sheets A200 to A204 for the facades that are included in this phase.
2. The scope of the Repair includes isolated repairs for cracks and spalls in the precast concrete panel, supplemental lateral anchorage at isolated panels, sealant replacement, and installation of flashing end dams and cavity closures at the interface between the precast concrete panels and brick masonry walls, which will necessitate removal and replacement of the brick masonry along the full height of the precast concrete panels.
3. All the existing caulk and joint sealant between the precast panels and brick masonry is to be removed. Sample testing of these materials has documented it does contain a low level of asbestos. Refer to the Hazmat Sheets HA200 to HA 204 and section 02 82 11 Traditional Asbestos Abatement.
4. The full height of the precast panels extends from grade level to the 11th floor roof level. The GC will determine the best and safest means of gaining access to the facades. This could include lift buckets, scaffolding and swing stages.
5. Before starting work on a façade, the GC must submit Safety and engineering plans outlining the method, must be submitted to COR for approval. Refer to section 01 35 26 Safety Requirements for Major Projects for additional requirements.

E. Period of performance for the construction contract is 9 months.

1.4 PROJECT MANAGEMENT TEAM

- A. **Submit Project Management Team delegation memorandum of the below four individuals meeting requirements as listed below and in accordance with Section 01 33 23 SUBMITTALS within 30 calendar days of the Notice to Proceed.** Please refer to 01 35 26 Section 1.7 for additional requirements.

B. Construction Project Manager (PM)

1. The PM shall have a minimum of five (5) years of construction project management experience managing projects similar in size, complexity, and scope.
2. The PM is not required to be dedicated to this project alone.
3. The PM shall be an employee of the General Contractor and shall be a separate and qualified individual from the General Contractor's Superintendent and Safety Professional.

C. Construction Superintendent (Supt)

1. The Supt shall have a minimum of five (5) years of construction superintendence experience as superintendent on projects similar in size, complexity, and scope.
2. The Supt shall be familiar with OSHA requirements and have experience in the areas of hazard identification and safety compliance in addition to safety training requirements as indicated elsewhere in these specifications. The Supt shall be intimately familiar with hospital infection control requirements. The Supt shall be capable of interpreting a critical path schedule and construction drawings.
3. The General Contractor shall provide adequate supervision wherever work is being performed on the contract.
4. The Supt shall be dedicated to this project alone.
5. The Supt shall be an employee of the General Contractor and shall be a separate and qualified individual from the General Contractor's Project Manager, or Quality Control Manager.

D. Quality Control Manager (QCM)

1. The QCM shall be responsible for the overall management of the Contractor's quality control system and has the authority to act in all QC matters for the Contractor.
2. The QCM shall have a minimum of five (5) years of construction QCM experience on projects similar in size, complexity, and scope.
3. The QCM does not have to be an employee of the General Contractor and shall be a separate and qualified individual from the General Contractor's Superintendent and Safety Professional. The Project Manager and QCM may be the same individual.

E. Safety Professional (SSHO)

1. The SSHO shall administer the General Contractor's Safety Program and government-accepted Accident Prevention Plan (APP).
2. The SSHO shall be dedicated to this project alone.
3. The SSHO is separate from and not the same individual as the contracted CSP or CHST; see the 01 35 26 Safety Specification.
4. The SSHO shall be an employee of the General Contractor and shall be a separate and qualified individual from the General Contractor's Project Manager and Quality Control Manager. The Supt and the SSHO may be the same individual for this project.

1.5 CONSTRUCTION SECURITY REQUIREMENTS

A. Submit Site Security Plan meeting requirements as listed below and in accordance with Section 01 33 23 SUBMITTALS within 30 calendar days of the Notice to Proceed.

B. Security Plan:

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

C. Security Procedures:

1. 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. A Special Agreement SAC form is required for every contract employee. See the SPECIAL NOTES specification for an example of this SAC form and the badging process. This needs to be supplied to the COR for every contract employee on the jobsite. Even if the Contractor has an active badge, a SAC form is needed for the COR's records.
3. Before starting work the Contractor shall give one week's notice to the Contracting Officer so that security escort arrangements can be provided for the employees. This notice is separate from any notices required for utility shutdown described later in this section.
4. No photography of VA premises is allowed without written permission of the Contracting Officer.

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

D. Document Control:

1. Before starting any work and as required by the Contracting Officer, **the General Contractor and sub-contractors shall submit an electronic security memorandum (i.e., Non-Disclosure Agreements) describing their approach to maintaining confidentiality of VA "sensitive information".**
2. The Contractor is responsible for safekeeping of all drawings, project manual and other project information. This information shall be shared only with those with a specific need to accomplish the project.
3. These security documents shall not be removed or transmitted from the project site without the written approval of Contracting Officer.
4. All paper waste or electronic media shall be shredded and destroyed in a manner acceptable to the VA.
5. Notify Contracting Officer and Site Security Officer immediately when there is a loss or compromise of "sensitive information".

E. Motor Vehicle Restrictions

1. Permits shall be issued for Contractor and its employees for parking in designated areas only. See the SPECIAL NOTES Specification.

1.6 OPERATIONS AND STORAGE AREAS

- A. **Submit Logistics Plan meeting requirements as listed below and in accordance with Section 01 33 23 SUBMITTALS within 30 calendar days of the Notice to Proceed.** At a minimum, the Logistics Plan shall include at least proposed laydown/storage areas, delivery routes, container & equipment staging, dumpsters, ingress & egress routes, and job trailers.
- B. Containers/deliveries/pallets shall be marked with the construction contract number and 695-22-121 project number. Dumpsters remaining on VA property longer than five days shall also be so marked. Coordinate dumpster requirements with the VA. Do not assume VA loading dock dumpsters are available for contractor use. See Construction Waste Management specification 01 74 19.

- C. 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.
- D. Temporary storage facilities and utilities may be requested, built, or implemented by the Contractor, but only with the approval of the COR. They shall be provided with labor and materials furnished by the Contractor without expense to the Government. Any temporary storage or utilities shall be removed by the Contractor at its expense upon completion of the work. Ultimately, working space and space available for storing materials shall be determined by the COR.
1. Do not store materials and equipment in other than assigned areas.
 2. Schedule delivery of materials and equipment to immediate construction areas only. Provide unobstructed access to roadways and sidewalks - complying with the traffic control plan - or other areas as required.
 3. Storage of Contractor's materials and equipment will be permitted subject to fire and safety requirements.
- E. The Contractor shall, under regulations prescribed by the Contracting Officer, use only established roads and assigned laydown areas as authorized by the COR. When materials are transported or delivered 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. Deliveries at the Loading Dock shall be coordinated with the COR. The Contractor shall not cross curbs, lawns, or sidewalks, and shall protect existing conditions from damage. The Contractor shall repair or pay for the repair of any damaged lawns, curbs, sidewalks, or roads.
- F. The Contractor and all subcontractor employees are subject to rules of Medical Center applicable to their conduct.
- G. Execute work 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.

Refer to the SPECIAL NOTES Specification for more details.

1. In accordance with the drawings, submit the Phasing Plan meeting requirements as listed below and in accordance with Specification 01 33 23 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES within 60 calendar days of the Notice to Proceed meeting.

H. Utilities Services: Maintain existing utility services in the Medical Center and on the VA campus. Provide temporary facilities, labor, materials, equipment, connections, and utilities to assure uninterrupted services when needed. Where necessary to cut existing pipes (sanitary drain, roof drain, condensate drain), 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 and Utility.

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. Refer to specific technical divisional specifications for additional requirements. Utility interruptions shall be off shift (after 5pm, with re-establishment of utility prior to 6am next day).
2. Contractor shall submit a request to interrupt any such services to COR, in writing, **21** days in advance of proposed interruption. Request shall state reason, date, exact time of, and approximate duration of such interruption. VAMC Milwaukee has a specific outage request form that shall be utilized.
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 Campus. Interruption time approved by Medical Center Campus may occur at other than Contractor's normal working hours.
4. Major interruptions (involving patient curtailment) of any system must be requested, in writing, at least 21 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.

I. Phasing:

1. **Submit initial Phasing Plans (there will be multiple) meeting requirements as listed below and in accordance with Section 01 33 23 SUBMITTALS within 30 calendar days of the Notice to Proceed meeting.**
2. The Medical Center Campus 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, and the infection control/interim life safety methods employed during the work defining the duration of the work with milestone subtasks. Refer to Specification 01 32 16.15 for schedule requirements.
3. To ensure such executions, Contractor shall furnish the COR with a schedule of approximate phasing dates on which the Contractor intends to accomplish work while meeting the phasing requirements in the Contract Documents. In addition, Contractor shall notify the COR three (3) weeks in advance of the proposed date of starting work in each specific area of site. Arrange such phasing dates to ensure accomplishment of this work in successive phases mutually agreeable to COR.
4. The project site is the exterior facades of Building 111; see the project drawings. Contractor shall plan for **day shift (8am-4pm) and off shift after 4pm, before ½ hour prior to sunset**, work with regards to demolition and new work.
6. **Work on Building 111 (main hospital) general phasing/ sequencing:**
 - a. Phase 1 - North Elevation 1
 - b. Phase 2 - North Elevation 3
 - c. Phase 3 - West Elevation 26
 - d. Phase 4 - South Elevation 25

- e. Phase 5 - South Elevation 23
- f. Phase 6 - South Elevation 21
- 7. The project site will be available to the Contractor immediately after issuance of the Notice to Proceed (to coordinate the pre-construction survey and for the preparation of other pre-construction submittals). **Only upon approval of required pre-construction submittals will the project site and any approved laydown areas be turned over to Contractor for mobilization and work.**
- 8. Contractor shall take all measures and provide all material necessary for protecting existing equipment and property in affected areas of construction against unnecessary destruction or damage, so that Medical Center Campus operations will not be hindered. Coordinate protection means in areas so that Medical Center Campus operations will continue without impact to staff, visitors and patients during the construction period.
- J. Construction Fence: Contractor is to provide. Protect access and set up areas to assure public and VA staff's safety. Plans for each construction area are to be submitted to COR 15 days prior to set up for approval.
- K. When the construction site is turned over to Contractor, Contractor shall accept entire responsibility including upkeep and maintenance, specifically:
 - 1. Storage of materials and equipment shall be orderly.
- L. Abandoned Lines: As necessary, 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.
 - 1. Those which are indicated to be abandoned but cannot be entirely removed shall be sealed, capped, or plugged at the main branch, or panel they originate from in an approved method. These shall be fully investigated by the Contractor and reviewed and accepted by the COR.
- M. Existing Conditions: Upon completion of demolition activities, there may be other existing MEP infrastructure to remain (conduit or piping). The Contractor shall be responsible for supporting and anchoring this infrastructure (that will remain) to meet current code requirements.

- N. To minimize interference of construction activities with flow of Medical Center Campus 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 always be open to traffic. Follow traffic control plan as noted in the drawings.
 2. Method and scheduling of required cutting, altering and removal of existing roads, walks and entrances must be approved by the COR.
 3. 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.
- O. Pre-Construction Submittal Requirements (items required to be complete prior to mobilization):

Preconstruction Submittal	Reference	Due
Surety Bonds & Certificates of Insurance		Prior to NTP
SF 1413s (Subcontractor List)		Pursuant to FAR 52.222-11
Schedule Consultant Qualification Proposal	01 32 16.15	Within 15d of award
Project Management Team Memo (PM, Supt, QCM, SSHO)	01 00 00/ 01 35 26	Within 30d of NTP
Construction Site Security Plan	01 00 00	Within 30d of NTP
Non-Disclosure Agreements	01 00 00	As Required
Logistics Plan	01 00 00	Within 30d of NTP
Construction Phasing Plan(s)	01 00 00	Within 30d of NTP * And as Required
Existing Conditions Survey	01 00 00	After each elevation is completed & prior to next elevation work

Construction Schedule (Interim)	01 32 16.15	Within 60d of NTP
Schedule of Values (SOV)	01 32 16.15	Within 30d of NTP
Submittal Register	01 33 23	Within 30d of NTP
Accident Prevention Plan	01 35 26	Within 60d of NTP
Activity Hazard Analyses	01 35 26	Within 60d of NTP, or 15d prior to Activity
OSHA Certificates and Applicable Training Documents	01 35 26	Within 60d of NTP (may include in APP)
Infection Control Plan(s)	01 35 26	Within 30d of NTP * And as Required
Fire Safety Plan	01 35 26	Within 30d of NTP
Environmental Protection Plan	01 57 19	Within 30d of NTP
Construction Waste Mgmt Plan	01 74 19	Within 30d of NTP
Construction Schedule (Final)	01 32 16.15	After Init Schedule and SOV have been approved
Sustainable Construction Spreadsheet	01 81 13	Within 30d of Kickoff

*** NOTE: EVERY NEW PHASE / WORKSITE SHALL REQUIRE A NEW INFECTION
CONTROL PLAN AND PHASING PLAN FOR VA REVIEW AND APPROVAL**

1.7 ALTERATIONS

- A. **Submit the Existing Conditions Survey as listed below and in accordance with Section 01 33 23 SUBMITTALS within 30 calendar days of the Notice to Proceed meeting.**
- B. Survey: Before any work is started, the Contractor shall make a thorough survey of the project sites with the COR and furnish a written report. COR expects an Existing Conditions Survey report/submittal for each Façade to be submitted after space is turned over to Contractor and prior to any work beginning. This report shall list:
 1. For exterior work, existing conditions of roads, curbs, grassy areas, existing above-ground infrastructure (signage, lighting, structures, hydrants) and other items not required to be altered

- during the contract work. The report should demarcate the items that are affected by the work from those that are not impacted by the work.
2. Existence and conditions of items such as plumbing accessories, electrical fixtures, mechanical equipment, architectural elements, railings, solariums, etc., required by the drawings to be either work around, remove and reinstall or both.
 3. 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. Coordinate with the Contractor's Logistics Plan.
- C. 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, to be in such condition that their use is impossible or impractical, shall be furnished and/or replaced by Contractor with new items in accordance with specifications which will be furnished by Government. Provided the contract work is changed by reason of this subparagraph B, the contract will be modified accordingly, under provisions of clause entitled "DIFFERING SITE CONDITIONS" (FAR 52.236-2) and "CHANGES" (FAR 52.243-4 and VAAR 852.243-70/71).
- D. Re-Survey: Thirty days before expected final inspection date, the Contractor and COR together shall make a thorough re-survey of the areas involved in the Existing Conditions Survey.
1. Re-survey report shall also list any damage caused by Contractor to roofs, walls, windows or above-grade infrastructure (roads, curbs, signage, hydrants, landscaping) 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.
- E. Protection: Provide the following protective measures:
1. Wherever existing building envelope 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 always, from damage, dust, and weather inclemency. Wherever work is performed, interior areas 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. Refer to Specification 01 74 19 for more information. Materials and equipment accruing from work removed and from demolition activities shall be disposed of as follows:
 1. Reserved items (existing to remain or existing to relocate) which are to remain property of the Government are identified in the drawings. 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 reinstallation and reuse. Store such items as directed by COR.
 2. Items not reserved shall become property of the Contractor and be removed by Contractor from Medical Center.

1.9 PROTECTION OF EXISTING STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS (FAR 52.236-9)

- A. The Contractor shall preserve and protect all structures and equipment, 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.
- B. The Contractor shall protect from damage all existing improvements and utilities at or near the work site and on adjacent property of a third party, the locations of which are made known to or should be known by the Contractor. The Contractor shall repair any damage to those facilities, including those that are the property of a third party, resulting from failure to comply with the requirements of this contract or failure to exercise reasonable care in performing the work. If the Contractor fails or refuses to repair the damage promptly, the Contracting Officer may have the necessary work performed and charge the cost to the Contractor.
- C. Refer to Section 01 57 19, TEMPORARY ENVIRONMENTAL CONTROLS, for additional requirements on protecting 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. FAR clause 52.236-7, "Permits and Responsibilities," will not be included in General Conditions. A National Pollutant Discharge Elimination System (NPDES) permit is not required for this project.

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, 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 VAAR 852.243-70/71) and "DIFFERING SITE CONDITIONS" (FAR 52.236-2).

1.11 PHYSICAL DATA - SOIL CONDITIONS: (NOT USED)

1.12 PROFESSIONAL SURVEYING SERVICES: (NOT USED)

1.13 LAYOUT OF WORK: (NOT USED)

1.14 AS-BUILT DRAWINGS

- A. The Contractor shall maintain a full-size set of as-built drawings ("red-lines") 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 "red-line" drawings shall be made available for the COR review, as often as requested.
- C. Contractor shall email as-built "red-line" drawings in the electronic version (scanned PDF) to the COR monthly for progress payment purposes.
- D. Contractor shall **submit** as-built "red-line" drawings in the electronic version (scanned PDF) to the COR at the completion of all new work and after acceptance of the project by the COR. The COR shall forward this submittal to the Architect/Engineer for review/approval and so that formal CAD as-built drawings can be developed for the VA.
- E. Contractors shall update (as work is completed) the VA exterior/site utility master schematic books. These books are in the FM office.

1.15 COORDINATION

- A. Coordinate work and products meeting the requirements associated with applicable specification sections and plans to produce a system complete, functional, and ready for the purpose intended.
- B. Before starting work in a particular area, visit the jobsite and carefully examine to verify complexity, existing conditions, and difficulties that will affect work including all work done under various specification sections. Commencement of work shall be construed as acceptance of the existing conditions and difficulties. No change to the contract price or schedule shall be allowed for worked caused by unfamiliarity with jobsite conditions that are visible or readily apparent by an experienced observer.
- C. Coordinate the location of work, equipment and components with trades, vendors, and installers to prevent interferences and maintain proper use and access to all items and spaces.
- D. Work shall be installed and connected to existing work neatly and carefully. Work shall be coordinated with other trades to avoid conflicts and to obtain a neat, competent installation that will afford maximum accessibility for easy and proper operation, maintenance, service, and headroom.
- E. Work shall be installed in a manner that permits easy accessibility and proper removal of components for periodic maintenance. Disturbed or damaged work shall be replaced or repaired to new conditions. Items determined to be in non-compliance shall be corrected by the Contractor at no additional expense to the Government.

- F. The drawings show or describe the general arrangement of equipment, articles, assemblies, appurtenances but do not show all required fittings, drains, air vents, supports and may not identify all required accessories, components, fittings, and offsets that are necessary to properly complete the installation for the purpose intended. The contract drawings are diagrammatic only intended to show general layout of conduit, ductwork, piping, equipment, terminals, specialties and not intended to show all required offsets, details, accessories, and equipment to be connected. Provide necessary fittings, offsets and pipe runs based on field measurements and reviewed coordination drawings. Coordinate with other trades for space available and relative location of equipment and accessories to be connected. The Contractor shall alter locations of items where necessary to avoid interference and clearance difficulties after notifying the COR. Locations of components and equipment shall be adjusted to accommodate the work with interferences anticipated and encountered. The Contractor shall determine the exact routing and location of systems prior to fabrication and installation. Accurate field measurements and coordination drawings shall be prepared to establish the locations and characteristics of the various systems (new and existing to remain). It is the intent of the drawings/specifications that the Contractor provides materials, labor, and coordination necessary to complete the work described or implied by the contract documents. The Contractor shall submit coordination drawings noting other dimensions with similar characteristics where necessary to avoid interferences and clearance difficulties. Should the contract documents not agree with themselves the greater quantity of superior work and materials shall be performed.
- G. Coordinate new work with necessary mechanical, electrical, and plumbing (MEP) utility outages meeting the requirements of this specification and that of 01 35 26 SAFETY REQUIREMENTS.
- H. Before placement and installation of work subject to tests, the Contractor shall coordinate and notify the COR in sufficient time to enable testing personnel to be present at the site in time for proper testing and field inspection. Such prior notice shall be not less than two (2) weeks unless otherwise designated by the COR.

1.16 WARRANTY MANAGEMENT: (NOT USED)

1.17 USE OF ROADWAYS: (NOT USED)

1.18 CONTRACTOR'S FIELD OFFICE: (NOT USED)

1.19 TEMPORARY USE OF MECHANICAL AND ELECTRICAL EQUIPMENT: (NOT USED)

1.20 TEMPORARY USE OF EXISTING ELEVATORS

A. Refer to Specification 01 01 10-SN SPECIAL NOTES for more information.

Use of existing B-bank freight and service elevators for handling building materials and Contractor's personnel will be permitted subject to following provisions:

1. Contractor shall note that use of the B-bank elevators (B-9, B-10, B-11, and B-12) is NOT exclusive. These elevators are shared with VA staff (food service), other Contractors, and also for patient transport.
2. Do NOT use an elevator if VA staff are utilizing it for patient transport. Wait for a future, empty elevator.
3. B-bank elevators are 6ft wide, 7ft deep and just under 8ft tall. They are rated at 5,500 lbs. Elevator B-12 has an additional ceiling "bump out" for longer materials (it is 6ft wide, 2ft deep and 2ft tall).
4. Contractor shall install temporary elevator protection as necessary and may leave it in place for the duration of the project if it does not impede usage by others (VA staff, food service carts, patient beds).
5. Personnel for operating elevators will not be provided by the Department of Veterans Affairs.
6. If existing cab protections, jambs, floor, or elevator systems are excessively worn or damaged during temporary use, they shall be removed and replaced at the Contractor's expense.
7. All parts of main controller, starter, relay panel, selector, etc., worn or damaged during temporary use shall be removed and replaced with new parts at the Contractor's expense.

1.21 TEMPORARY USE OF NEW ELEVATORS: (NOT USED)

1.22 TEMPORARY TOILETS: (NOT USED)

1.23 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. The Contractor shall carefully conserve utilities as they will be furnished without charge.

- B. The Contractor, at Contractor's expense and in a workmanlike manner, in compliance with code and as satisfactory to the COR, shall install and maintain all necessary temporary connections and distribution lines to include temporary lighting, and power if required. Before final acceptance of the work by the Government, the Contractor shall remove all the temporary connections, distribution lines, lighting, and associated equipment and repair restore the infrastructure as required.
- C. Heat: Refer to Article 1.6 (H) for more information. If required, 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.
- D. Electricity (for Construction and Testing): If required, furnish all temporary electric services. Obtain electricity by connecting to the Medical Center electrical distribution system. Electricity is available at no cost to the Contractor.
- E. Water (for Construction and Testing): If required, furnish temporary water service. Obtain water by connecting to the Medical Center water distribution system, coordinate with COR. Provide reduced pressure backflow preventer at each connection as per code. Water is available at no cost to the Contractor.
 - 1. Maintain connections, pipe, fittings and fixtures and conserve water. Failure to stop leakage or other wastes will cause for revocation (at COR discretion) of use of water from Medical Center's system.

1.24 NEW TELEPHONE EQUIPMENT: (NOT USED)

1.25 TESTING:

- A. There will be no formal third-party Commissioning Agent on this contract.
- C. Conduct final tests required in various sections of specifications in presence of the COR, AE inspectors The Contractor shall furnish all labor, materials, equipment, instruments, and forms, to conduct and record such tests.
- D. 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.

- E. All related components as defined above shall be functioning when any system component is tested. Tests shall be completed within a reasonably period during which operating and environmental conditions remain reasonably constant and are typical of the design conditions.
- F. 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.

1.26 TRAINING & INSTRUCTIONS; O&M MANUALS: (NOT USED)

1.27 GOVERNMENT-FURNISHED EQUIPMENT; (NOT USED)

1.28 RELOCATED EQUIPMENT: (NOT USED)

1.29 STORAGE SPACE FOR GFE: (NOT USED)

1.30 CONSTRUCTION SIGN: (NOT USED)

1.31 SAFETY SIGN: REQUIRED ADD INFORMATION: (NOT USED)

1.32 PHOTOGRAPHIC DOCUMENTATION

- A. During the construction period through completion, provide photographic documentation of construction progress and at selected milestones including preconstruction, Haz Mat removal, brick removal, existing conditions of PC, flashing and brick cavity, installation of flashing, finished work.
- 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 8 x 10-inch prints with a minimum of 2272 x 1704 pixels and 16 x 20-inch prints with a minimum 2592 x 1944 pixels.
 - 2. Indexing and navigation system shall utilize the construction drawings, making such drawings interactive. 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.
 - 4. Before construction, the existing conditions of the site shall be documented/photographed. Overlapping photographic techniques shall be used to ensure maximum coverage. Indexing and navigation accomplished through interactive architectural drawings.
 - 5. Construction progress for all trades shall be tracked at meaningful intervals, i.e., the beginning/middle/end of individual work

elements or tasks. Progression documentation shall track all demo and new work around the precast panels and masonry.

6. As-built conditions of structural, back of PC panels, masonry cavity found electrical, plumbing and all other systems shall be documented post-inspection and pre-insulation. Overlapping photographic techniques shall be used to ensure maximum coverage. Indexing and navigation accomplished through interactive drawings.

7. As-built finished conditions of the exterior conditions shall be documented prior to removing construction access or just prior to acceptance of work, or both, as directed by the COR. Overlapping photographic techniques shall be used to ensure maximum coverage. Indexing and navigation accomplished through interactive drawings.

C. Images may be taken by a commercial photographer or the Contractor and must show distinctly, at as large a scale as possible, all parts of work embraced in the picture.

D. Contractor shall be responsible for all coordination of photo shoots.

E. 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.

1.33 FINAL ELEVATION DIGITAL IMAGES: (NOT USED)

1.34 HISTORIC PRESERVATION: (NOT USED)

1.35 VA TRIRIGA CPMS: (NOT USED)

PART 2 - (NOT USED)

PART 3 - (NOT USED)

- - - E N D - - -

SECTION 01 01 10 (SN)
SPECIAL NOTES

PART 1 - GENERAL

1.1 DESCRIPTION

This section specifies special requirements, processes, procedures, protocols, practices, prohibitions, protections, personnel matters, provisions for unique characteristics of the Milwaukee VAMC, and practical matters pertinent to construction.

1.2 RELATED WORK

- A. Section 01 35 26 SAFETY REQUIREMENTS.
- B. Section 01 00 00 GENERAL REQUIREMENTS.
- C. Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS.
- D. Section 01 74 19 CONSTRUCTION WASTE MANAGEMENT.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 ANTE-ROOM CONSTRUCTION PRACTICES:

- A. Coordinate construction of the ante-room with NFPA 241 and the Specification Section 01 35 26 SAFETY REQUIREMENTS.
- B. Type "A" and "B" activities are those in which the fire/smoke hazard risks are MINIMAL. Type "C" and "D" activities are those in which the fire/smoke hazard risks are HIGH. The General Contractor is obligated to consider the specified containment measures with the costs included within the various contract items of work. Refer to the Appendix for the Construction Barrier and Fire Risk Assessment Matrix of Precautions for more information.
- C. Type A (Minimal Fire Risk Activity/Construction): Provide authority to proceed with work in area, includes a ceiling permit as required, when working above ceilings.
- D. Type B (Limited Fire Risk Activity/Construction):
 - 1. Coordinate temporary construction partition installation with Specification Section 01 35 26 SAFETY REQUIREMENTS.
 - 2. Provide plastic from floor to ceiling above and seal joints and penetrations. All plastic will be labeled with the VA ILSM TEMPORARY BARRIER orange tag once installed indicating the start of the three days. At openings, install z-wall overlapping plastic flap barriers or equivalent.

E. Type C (Moderate Fire Risk Activity/Construction): Coordinate temporary construction partition installation with Specification Section 01 35 26 SAFETY REQUIREMENTS.

1. Ante-room construction (as part of 1-hour construction barrier):

- a. Ante-room shall be a 1-hour fire-rated smoke-tight temporary construction partition and shall be full height, extending through suspended ceilings to the floor slab or roof deck above.
- b. Ante-room shall be constructed from one-hour fire-rated 5/8-in type "X" gypsum board both sides of metal stud wall, mudded and taped in accordance with ASTM C840. "Double" gypsum board installation on one side (exterior) of the ante-room is authorized to achieve the 1-hour fire-rated smoke-tight temporary construction partition requirement with prior COR approval.
- c. In this case, the ante-room 1-hour fire-rated smoke-tight temporary construction partition walls will also function as an infection control barrier. Contractor shall add appropriate infection control measures. Refer to 01 35 26 SAFETY REQUIREMENTS for more information.
- d. Ante-room gypsum board walls shall be taped to the existing floors utilizing 2-in wide glass foil tape: 7.3 mil aluminum foil laminated glass cloth silver tape with silicone adhesive backing. Where the ante-room walls meet the existing deck or a 1-hour rated existing wall, the seams shall be fire caulked.
- e. The ante-room must also have a dedicated heat detector installed. See paragraph below for heat detector requirements.
- f. Ante-room outer construction door opening requires a Class C, 45-minute fire rated door with self-closing and self-latching devices.
- g. Ante-room inner door must at least be plastic Z-Type door.

2. Ante-room construction (for infection control purposes only):

- a. Ante-room **need not** be a 1-hour fire-rated smoke-tight temporary construction partition. Its walls **do not need** to go to the concrete deck above, nor is a hard ceiling required. At a minimum, the contractor must tape the top of the ante-room walls to the underside of the existing acoustical tile ceiling to achieve the smoke tight and infection control requirements.

- b. Ante-room shall be constructed from one-hour fire-rated 5/8-in type "X" gypsum board **one** side of metal stud wall, mudded and taped in accordance with ASTM C840.
 - c. Contractor shall add appropriate infection control measures. Refer to 01 35 26 SAFETY REQUIREMENTS for more information.
 - d. Ante-room gypsum board walls shall be taped to the existing floors, walls or ceilings utilizing 2-in wide glass foil tape: 7.3 mil aluminum foil laminated glass cloth silver tape with silicone adhesive backing. Where the ante-room walls meet the existing deck or a 1-hour rated existing wall, the seams shall be fire caulked.
 - e. The ante-room **does not** require a dedicated heat detector.
 - f. Ante-room outer construction door opening requires a Class C, 45-minute fire rated door with self-closing and self-latching devices.
 - g. Ante-room inner construction door opening requires a Class C, 45-minute fire rated door with self-closing and self-latching devices.
3. Provide heat detectors and notification devices (i.e., audio-visual devices) tied into the Building Siemens Pyrotronics System at the rate of one (1) detector per 1000 square foot of clear construction area. Heat detectors to be FPT-11 Addressable, Tri-Color LED, 135°F, Combination Fixed or Rate of Rise. The Contractor shall provide certification documentation once the heat detectors and notification devices (i.e., audio-visual devices) are installed and/or moved and tested prior to any construction work taking place in the space. Inside the construction space, existing units can be used if they are moved to the floor deck above.
- a. Heat detectors require monthly service checks by the contractor to ensure they are working correctly.
4. Other than ante-room, all other temporary construction partitions shall be full height, extending through suspended ceilings to the floor slab or roof deck above and shall be one-hour fire rated 5/8-in type "X" gypsum board both sides of metal stud wall, mudded and taped in accordance with ASTM C840. If sprinklers are installed per a hydraulically calculated stamped and certified system and sprinklers are operational on both sides of the temporary partition and ceilings are fully intact and complete, then the partition indicated above may be permitted to terminate at the ceiling in accordance with NFPA 241.

5. Coordinate with Section 01 01 10-SN Section 3.35 for Card Reader and Physical Access Control System (PACS) requirements at ante-room outer construction door.

F. Type D (Significant Fire Risk Activity/Construction):

1. All requirements for Type C construction activities above are required for Type D construction activities.
2. When required by the project, install one-hour fire-rated temporary construction partitions to maintain integrity of existing exit stair enclosures, exit passageways, fire-rated enclosures of hazardous areas, horizontal exits, smoke barriers, vertical shafts and openings and other enclosures as required by the current Life Safety Code NFPA 101. This may include new horizontal egress tunnels, exit stairs, etc. Coordinate these activities with the COR.

3.2 ASBESTOS-CONTAINING MATERIALS (ACM)

- A. There are both friable and non-friable asbestos-containing materials (ACM) located within hospital complex. Inspection reports are available from Facilities Management.
- B. ACM might be unforeseen and potentially discovered during work. Do not disturb ACM. Refer to Specifications Section 01 00 00 for procedures addressing discovery of ACM.
- C. See Specification Sections 02 82 11 or 02 82 13 (series) for Traditional or Glovebag Asbestos Abatement details.
- D. New work: no ACM allowed in new products.
- E. Contractor to provide asbestos costs separately in invoices.

3.3 BADGES

- A. All contractors working at Milwaukee VAMC shall be fingerprinted prior to being allowed to work on campus. During the 30-day Pre-Construction Period, the GC shall submit required paperwork to get all non-badged employees fingerprinted and badged. Contractor ID badges can be obtained from PIV office typically 3-5 days after approved SAC form is received and fingerprints clear. ID badges are required for contractor employees working at VAMC Milwaukee.
- B. Contractor
 1. Furnish SAC form to each employee and subcontractor employee, regardless of how long they will be on site and even if they have already badged and have them fill out the form. Blank SAC form is included as appendix to this specification.

2. When form is legibly completed by hand, scan each form with file name as above then dash then employee name (e.g., 08 SAC FORM - John Doe).

3. Regarding SSN: last four only.

4. Email form to VA project manager (a.k.a., COR)

C. VA and Requestor

1. VA COR/project manager signs form, then emails Fingerprinting Office (fingerprinting) and PIV Office (badging) of pending visit from person named, forwarding form as email attachment.

2. Contractor/Requestor visits Fingerprinting/PIV Office, building 70, D-wing north, ground floor.

3. VA Fingerprinting Office will check to ensure proper form was received.

D. VA Processing

1. Fingerprinting begins background check process.

2. Assuming background check allows, then within 3 to 10 business days, VA should send to Contractor/Requestor notice that they may now obtain their Physical Access Control (PAC) badge.

3. Contractor/Requestor must show two (2) forms of government identification to VA PIV staff.

4. VA PIV Office staff take photo and issue PAC badge.

E. Badge Usage

1. Wear badge, readily visible, above waist level, not on head or hard hat, when on grounds doing work.

2. Lanyards and clips are not included but may be purchased at Canteen Store.

3. Superintendent shall inspect personnel badge (should be visible).

4. Badges allow keyless entry into restricted areas. Names, dates, and times of access are recorded by VA Police.

5. Badges will be valid for 90 days. The PM will notify PIV office to extend badge access for another 90 days if appropriate.

6. Badge wearer, not anyone else, must get badge issues taken care of. For example, it is not allowed to hand over badge to superintendent to walk them down to FM or PIV for entering code on back of badge, into SAM box system. Violations may result in suspension or revocation of construction access.

3.4 CONTRACTOR'S IMPACT STATEMENTS

- A. These notes will be reviewed at pre-construction meeting and will require signature from Contractor acknowledging responsibilities of contractors working on VAMC campus.
- B. All sub-contractors are required to review, acknowledge, sign and submit CONTRACTOR'S IMPACT STATEMENT. It is General Contractor's responsibility to make this specification available to sub-contractors and for training sub-contractors on VAMC Milwaukee requirements herein.
 - 1. STANDARD POLICY: All outside contractors and sub-contractors will coordinate work within hospital with Facilities Management before beginning work.
 - 2. PURPOSE: Contractor will ensure that each individual contractor and sub-contractor employee is responsible for complying with established hospital standards, applicable OSHA Safety Requirements, federal, state and local environmental regulations, wearing prescribed safety equipment, and preventing avoidable accidents.
 - 3. PROCEDURE: Contractor will ensure that each individual contractor and sub-contractor employee review, understand and acknowledge these Special Notes prior to commencement of work scheduled at this facility. Proof of this acknowledgement: CONTRACTOR'S IMPACT STATEMENT. Contractor will forward copies of signed CONTRACTOR'S IMPACT STATEMENT monthly during construction for new contractors and sub-contractors.

3.5 CLEAN-UP

- A. All work activity within occupied portions of facility shall be immediately cleaned and restored to its original finished condition upon completion of activity. If activity continues into next workday, area shall be left safe, clean, and presentable.
- B. Combustible storage and debris shall be kept to smallest quantity necessary for required daily operations. All combustible materials must be removed from roof areas at the end of the daily work shift. Construction area shall be kept clean as indicated in general requirements and conditions.
- C. Public restrooms are not to be used for cleaning of tools or equipment, i.e., paintbrushes, rollers, finishing tools, etc. Janitor's slop sinks are available for this purpose. If janitor closets are used, they must

be cleaned. The contractor is responsible for any clogs, repairs to drains, and cleaning if their cleaning techniques damage VA property.

- D. Trash, combustible waste, and excess construction materials: Remove daily, dispose regularly to prevent accumulation.
- E. All work for area must be confined within that space. Public corridors, stairwells, equipment rooms, and vacant floors are not to be used for storage of materials or as workshop. Tracking construction dirt into public corridors or stairwells must be prevented. At end of each workday, combustible packaging and creating materials for building products and equipment to be installed shall be removed from construction site.
- F. Provide dampened walk-off mats at entrances and exits from construction area.
- G. If smoke detectors are covered during dust-producing activities, they must be uncovered daily.
- H. During gypsum board installation, "mudding", mortar, or sealant work, note that the Contractor is prohibited from using VA sinks or basins for the cleaning of tools and equipment. Contractors shall bucket wash their tools and then dispose of the bucket water outside at a COR-approved location.

3.6 COMPRESSED GAS CYLINDERS

- A. Contractors who work with compressed gas cylinders must have specific training and must ensure that cylinders are secured properly when in use or in storage.
- B. When compressed gas cylinders are not in use, caps must be in place.

3.7 CONFINED SPACE

- A. Confined Spaces are clearly marked on campus. NO ENTRY is allowed into areas without prior approval by COR. NO ONE will be allowed to enter these areas without proper qualifications, equipment and training as required by OSHA Standards (29 CFR 1910.147)
- B. Storm sewers, underground electrical vaults, and other areas that require confined space permits are identified on Drawings.
- C. All hospital personnel that would require entry into these spaces must abide by Confined Space Program Procedure.
- D. It is sole responsibility of outside Contractor doing work on VA Medical Center campus to coordinate entry into of these spaces or other marked permit required confined spaces with COR.

- E. Anyone entering permit-required confined space must follow Occupational Safety and Health Administration (OSHA) Regulations, 29 CFR 1910.120.
- F. Submit Confined Space Entry program (and CSE Permit if needed) as part of APP (See Safety Specification 01 35 26).

3.8 CONSTRUCTION BARRICADES & TEMPORARY SIGNAGE

- A. The Contractor is responsible to post and erect barricades, temporary signage, construction and safety signs, ILSMs, and new egress routes as they apply. barricades will be erected to restrict areas where hazardous operations are performed. construction and safety signs shall consist of caution signs as determined and approved by VAMC. Egress signs, where egress has been altered for construction, shall be posted and coordinated with approved ILSM and applicable hazardous warning signs. If egress is changed due to construction, provide temporary directional signs for changes as determined by VAMC and for construction of walkways, steps, or overhead protection scaffolding or like as required providing new means of egress. **Emergency egress plan shall be developed by Contractor and submitted for approval by COR before egress routes are altered.**
- B. Exit signs inside construction space: Contractor to provide luminescent Exit Signs throughout construction space such that while standing in place within construction space, exit sign is visible and path of egress can be followed.
- C. Exit signs outside construction space: Contractor will cover or relocate exit signs impacted due to their construction operations as directed by ILSM and COR.

3.9 CONSTRUCTION BARRIERS

- A. Refer to paragraph 3.1 of this specification and the appendix table Construction Barrier and Fire Risk Assessment Matrix for more information.
- B. The construction barrier consists of both existing walls and new construction (typically the ante-room) walls. The intent of the barrier is to provide a fire-rated and smoke tight 1-hour construction partition around the construction area meeting the requirements of NFPA 241. Contractor must coordinate the erection of any new walls for construction barriers with the Specification Section 01 35 26 SAFETY REQUIREMENTS and any additional infection control requirements.
- C. The interior construction site must be surrounded by a 1-hour fire-rated gypsum board, smoke tight and fire-stopped construction assembly.

Infection control procedures (as may be also required) shall be initiated prior to any other construction activities.

- D. All existing walls surrounding the construction area are to be inspected, repaired, patched and fire-stopped as required to bring them up to current fire-rated and smoke barrier construction requirement per NFPA 241.
- E. Penetrations through the construction barriers or any other rated assembly need to be plugged with a fire-resistant mineral wool filling and recorded with an ILSM Firestop Tag (see appendix). All penetrations are to be made temporarily fire and smoke resistant by the end of the construction day; and all penetrations shall be permanently fire-caulked within 30-days of being made.

3.10 CONSTRUCTION SITE PHONE: (NOT USED)

3.11 CONTRACTOR TRAINING & CERTIFICATES

- A. Employees of Contractor and sub-contractor shall be aware of egress routes from construction areas. It is Contractor's responsibility to ensure employees are aware of fire alarm codes for building they are working in and participate in fire alarm drills and actual fire alarms.
- B. Project Site Superintendent shall have 30-hour OSHA Construction Safety certificate. This certificate shall be submitted to COR prior to mobilization.
- C. All subcontractor competent persons (CPs) shall have 30-hour OSHA Construction Safety certificate. This certificate shall be submitted to COR prior to mobilization.
- D. Remaining employees of Contractor and sub-contractors shall have 10-hour OSHA certified Construction Safety course. These certificates shall be submitted to COR prior to mobilization.

3.12 CRANES & HEAVY LIFTING

- A. Refer to Specification Section 01 35 26 Safety Requirements for additional details.
- B. Hoisting or lifting heavy materials/items requires prior review by COR.
- C. Crane operations require workplans for VA approval and cannot commence without approved permit.

3.13 DELIVERIES

- A. All material deliveries at Building 111 loading dock must be coordinated with Receiving Department (Logistics Warehouse) in advance.

- B. Deliveries to other project sites/buildings on campus require coordination and approval of COR.

3.14 DRESS CODE

- A. All contractor personnel must be appropriately dressed for their work. T-shirts or garments with obscene or suggestive messages are not permitted. Personnel found improperly dressed will be asked to leave facility. Contractors may not remove shirts or other clothing. No articles may include offensive statements/graphics.
- B. Personal Protective Equipment is responsibility of Contractor. There are many situations that require specific personal protective equipment for worker safety per OSHA.
- C. Contractor to provide four (4) sets of hard hats, safety glasses, and hearing protection for each worksite for VA staff use.

3.15 ELEVATOR USAGE

- A. Contractors shall not hold or block from use public elevators in building unless authorized by COR.
- B. Within Building 111 (Main Hospital), contractors shall use B-bank freight elevators only for delivery and transportation of materials and demolition materials.

3.16 EMERGENCIES AND EMERGENCY SERVICES

- A. All offerors, if successful, must be able to respond to contract and Contractor created emergency services resulting from Contractor actions and installations, as determined by VAMC COR, with qualified staff personnel within one (1) hour of verbal notification during construction stages and warranty period. Bidders must be prepared to show proof, in writing, that they can satisfy this requirement prior to award.
- B. First Aid/Medical Aid/Emergency Treatment for workers: Any Contractor who witnesses medical emergency is to pick up nearest VA phone and dial "911" or operator and describe condition of emergency. Post emergency phone numbers and treatment facilities if Contractor employees are injured on job or need medical treatment.
- C. Work site injuries must be reported to VA. VA has accident reporting form (form number 2162). Safety or Security and Police Service will initiate 2162. Once VA has completed supervisor's portion injured individual will be required to complete narrative portion of report.

Service chief responsible for contract is also required to sign report and forward original report to Safety Section.

- D. Submit Fire Plan submittal for construction; see specification section 01 35 26. Within VAMC, note that there is no difference between fire drill and actual fire.
- E. Contractor will ensure that each employee on worksite knows where pull stations are in areas of work. VAMC policy for personnel IN THE AREA OF fire:
 - 1. **Rescue** anyone from area if necessary
 - 2. **Activate** nearest Pull Station
 - 3. **Contain** fire by closing doors in area
 - 4. **Extinguish** if possible or **Evacuate** area immediately
- F. When NOT IN THE AREA OF fire:
 - 1. Contractors are to cease activities, stay in place, and wait for further instructions or drill cancellation.
 - 2. DO NOT move through hospital or use elevators.
- G. Patients and visitors sometime become anxious or irritated because of their situation. If you are faced with patient or visitor that gets aggressive with you, simply call Ext. 42222 and say, "Code Green" and describe situation. Security will respond immediately.

3.17 FIRE/SECURITY ALARM SYSTEMS

- A. Cover and protect smoke/heat detectors with paper bags when raising dust or creating smoke in short duration (less than 3 days) ancillary work areas. Facilities Management, Graphics and Fire Marshall shall be notified when bagging smoke detectors. Remove paper bag upon completion of your work and at end of each workday.
- B. Advise Graphic Control Center (Graphics) at extension X41010 and VA Police Dispatch Desk at extension X42222 prior to work which might result in Fire Alarm System or Security System being activated. This includes but is not limited to: Smoke Detectors, Water Flow Switches, Pull Stations, Sprinkler Heads, Motion Detectors, Door Contacts, and Security Door Controls. Likewise, have approved outage from Facilities Management.
- C. Notification to Graphics/VA Police and having approved outage form does not absolve Contractor from following proper procedures to prevent system from activating. Examples of these best practices include

covering smoke heads with paper bags, closing valves, containing dust, monitoring and controlling security devices, etc.

- D. If system activates due to Contractor's failure to notify Graphics, or Contractor's failure to follow proper procedures, or Contractor's failure to obtain outage form, Modification/Settlement by Determination deduction of \$2,500.00 per alarm/event will be issued to Contractor.
- E. If you accidentally trip alarm, notify Graphics and Facilities Management immediately.
- F. Fire and/or smoke doors shall not be propped open or prevented from closing and latching. This includes Infection Control/Construction doors, mechanical equipment rooms and utility closet doors.

3.18 FLU SHOT REQUIREMENT (CURRENT AS OF JANUARY 2026)

- A. Per VHA Directive 1192.01 issued August 10, 2020, VA contractors are defined as Health Care Personnel as they work in VHA Medical Centers and could encounter VA employees, patients and visitors.
- B. It is VHA policy that medical facilities will achieve a mandatory seasonal influenza vaccination program by requiring all HCP to receive annual seasonal influenza vaccinations or obtain an exemption for medical or religious reasons. Compliance with this directive is the condition of the contract.
- C. Contractors desiring a copy of VHA Directive 1192.01 may obtain one from the GLAC.

3.19 HAZARDOUS, FLAMMABLE MATERIALS AND WASTE

- A. Caution must be used with flammable materials, i.e., adhesives, thinners, varnishes, etc.
- B. All paints shall be low odor latex paint. Use odor reducing agents in paints and solvents. Ventilation shall be required if toxic or foul-smelling materials must be applied.
- C. A listing of hazardous materials that will be used on job and their material safety data sheets (SDS) shall be made available to VAMC/COR upon request before chemicals are used.
- D. SDSs are available to Contractor for materials used in Medical Center; contact COR if required.
- E. The VA GEMS Coordinator is responsible for this program and will brief Contractor during construction kickoff.
- F. The Contractor may subscribe to online SDS service where SDS data sheets are available online in lieu of hard copies on job site.

- G. Any excess or used chemicals will be removed from hospital promptly and properly disposed of by Contractor in accordance with federal, state and local regulations.
- H. Any hazardous waste generated at facility must be properly contained and labeled and stored in accordance with local, state, federal and hospital regulations.
- I. Only one-day supply of paints, oils, and gas cylinders is permitted within facility, unless properly stored in flammable liquid storage container. Do not store flammable materials on roofs or within 25' building exterior walls. In facility unless stored in approved non-combustible storage cabinet or prior approval by GEMS Coordinator and COR.
- J. Coordinate hazardous materials issues and concerns with COR and GEMS Coordinator.
- K. Gasoline powered equipment shall not be used within confines of any buildings on VAMC campus without specific written permission from Chief, Engineering Services.

3.20 HOT WORK PERMITS

- A. Hot work permits are required before cutting, soldering or welding operations begin. Before cutting, soldering or welding is conducted, obtain permission from COR through hot work permit.
- B. Gas and oxygen canisters shall be properly chained and protected, and two 10-pound fire extinguishers shall be present.
- C. A fire watch shall be maintained on worksite during hot work operations, and for 60 minutes after hot work is completed.
- D. All burn permits will be completed, signed and scanned within 48 hours and posted to specified file share site. Contractor shall return fire watch portion of hot work permit to COR upon completion of work.

3.21 HOURS OF WORK

- A. The usual hours of contract work shall be from 8:00am until 4:00pm, which is normal work shift for hospital employees. Verify shift or shifts required for construction areas with COR. If Contractor desires to work on "other than normal" or after (off-shift) hours (including federal holidays), they shall be scheduled with COR three weeks before start. These off-hours will be required to complete project in time allotted for contract at no additional cost to VAMC. Upon approval of VAMC, Contractor will propose scope or extent of off-hour work due to

individual Contractor resources available to accomplish this project in time allotted. In addition, these off-hours will be required for utility/service interruptions, and any/other work that may interrupt operation of occupied space, i.e., some road construction, demolition, work in occupied areas, work affecting occupied areas, etc. Some noise producing demolition operations will be required to be scheduled for off work hours as directed by COR and described on drawings.

B. All outages not completely confined to the construction area shall be off-hours.

C. In some construction, buildings, floors, or wards may be occupied during performance of work. In other phases, areas of alterations will be vacated. Refer to Drawings and Contract Documents for details. Take measures and provide 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 Medical Center's operations will not be hindered. Permit access to VAMC personnel and patients through other construction areas, which serve as routes of access to such affected areas and equipment. Coordinate alteration work in areas occupied by VA so that Medical Center operations will continue during construction period. Contractor may be required to construct 7 feet tall by 5 feet wide metal stud and drywall tunnels through occupied space as deemed necessary by VA for access by Medical Center personnel and maintaining construction operations.

3.22 IDENTIFICATION AND LABELING (NOT USED)

3.23 INFECTION CONTROL

A. Refer to the drawings and Specification Section 01 35 26 SAFETY REQUIREMENTS for additional details.

3.24 INTERIM LIFE SAFETY MEASURES

- A. Any life safety code violations incurred during construction or renovation must be resolved and will result in close coordination with COR and VA Safety to implement hospital's Interim Life Safety Measures. These measures are required by JCAHO and NFPA.
- B. The hospital will document whether and to what extent Interim Life Safety Measures (ILSMs) will be implemented for each project.
- C. VA Safety will ensure what ILSMs are required by Contractor to temporarily compensate for hazards posted by existing Life Safety Code

(LSC) deficiencies or construction activities in areas of Medical Center.

- D. Implementation of ILSMs will be required in or adjacent to construction areas and throughout buildings with existing LSC deficiencies. ILSMs apply to both construction workers and affected hospital employees and will be implemented upon construction development and continuously enforced through construction completion.
- E. Interim Life Safety Measures will require walkthrough inspections by Contractor's superintendent at daily intervals.
- F. Training of workers and affected staff will always be significant part of Interim Life Safety Measures procedures.
- G. Fire and/or smoke doors shall not be propped open or prevented from closing and latching. This includes Infection Control/Construction doors, mechanical equipment rooms and utility closet doors.

3.25 INSPECTIONS

- A. A list of required inspections by VA personnel is included in Specification Section 01 32 16.15 Project Schedules.
- B. Mechanical, plumbing, and electrical work shall be inspected by VAMC Facilities Management to include appropriate engineering service shop and COR prior to being put into operation or closing if work will be hidden by walls, ceilings, drop ceilings, cover plates, and access panels. Notify COR minimum of two days prior to inspection date; times and dates shall be scheduled and agreed upon by VA. Installations will be inspected by VA personnel to verify compliance with State, Federal, Local, Veterans Affairs Codes, regulations and contract requirements. If corrections, alterations, adjustments, or additional new construction are required, VA will be notified within 48 hours of completion of such items. These inspections, corrections, or alterations will be made at no additional time or cost to VA.

3.26 LOCK OUT/TAG OUT

- A. Refer to Specification Section 01 35 26 SAFETY REQUIREMENTS for additional details.
- B. Lock Out/Tag Out - No contract worker can change status/ position of ANY switch, valve or other energy source without prior approval from COR. All Lock Out/Tag Out activities need approval prior to being implemented. Any activity requiring Lockout/Tagout process must comply with Safety Requirements specification and VAMC policies.

- C. Per OSHA Regulation 29 CFR 1910.147, Contractors must comply with OSHA's Safety Lock Out/Tag Out procedures.
- D. Coordinate shutdowns with Facilities Management and COR.
- E. Only VA staff is authorized to shut down utilities unless permission is specifically granted.

3.27 NOISE

- A. All drilling, chipping, or pneumatic hammering (typical) operations shall be done at time and day determined by occupants on that floor and floors above and below. Coordinate this work via workplan through COR for approval.
- B. The patients, visitors, and staff deserve consideration and quiet enjoyment of their premises. Anyone who is found being loud, rude, or otherwise annoying to patients, their guests, or staff will be asked to leave facility. Use of vulgar language will not be tolerated.
- C. All work activity outside of or within occupied portions of facility shall be accomplished with minimal disruption to patients, physicians, visitors, and staff.
- D. The playing of radios, tapes, and CD players is not permitted outside patient rooms or within occupied area
- E. The playing of radios, tapes, and CD players is permitted in vacant areas but shall not be heard outside vacant area.
- F. In inpatient areas, coordinate construction activities and debris removal with Nurse Manager or Charge Nurse to minimize disruption.

3.28 NON-DISCLOSURE AGREEMENT & PRIVACY/INFO SEC TRAINING

- A. General Contractor's employees shall complete necessary Privacy and Information Security training during pre-construction phase. The COR will provide this training so that VA-sensitive and patient information is safeguarded always and to prevent unlawful disclosure by contract employees.
- B. In conjunction with the VA's ISO and PSO and depending on the access the contractor may have during construction (data closets, patient records rooms, etc.), the COR shall require the contractor fill out and submit a Non-Disclosure Agreement Form (VA Form 0752).
- C. The Contractor can access the Internet through the VA's Guest Wi-Fi. COR will provide password.

3.29 OSHA COMPLIANCE

- A. All Contractors are subject to Occupational Safety and Health Administration (OSHA) regulations and are expected to enforce these standards in performance of their work.
- B. OSHA regulations can be found in chapter 29 of Code of Federal Regulations (CFR). Failure on part of Contractor to comply with these standards and/or conduct their work in safe fashion will result in interruption in work schedule for which Contractor will be solely responsible.
- C. Any Contractor found deviating from regulatory standards or policy will immediately be issued stop work order and will be responsible for contractual conflicts related to work stoppage.
- D. Fire and/or smoke doors shall not be propped open or prevented from closing and latching. This includes Infection Control/Construction doors, mechanical equipment rooms and utility closet doors.

3.30 PARKING

- A. Contractors may not block fire lanes or other roadways. Contractors may not park in patient, staff or visitor parking lot or structure. Violators will be ticketed. During large construction projects, staging site may be available for short term delivery parking to Contractors.
- B. All Contractors who need parking must contact Facilities Management for parking permit.
- C. If special parking is required, permission shall be granted and coordinated through Facilities Management. Until then, Contractors shall park in designated Contractor Parking Lot. Limited loading and unloading will be permitted at loading dock area.

3.31 PATIENT/VISITOR PRIVACY

- A. Contractors may not review, acknowledge or move patient information or records.
- B. Contractors may not acknowledge patient or visitor unless spoken to - even if individual is known on personal basis.
- C. Cell phones are to be used only in designated areas.

3.32 PENETRATIONS

- A. All wall, floor and ceiling penetrations created by work on this contract, whether by demolition or new construction, shall be patched by Contractor or as assigned by Contractor. All patching materials shall be of like kind or suitable substitute approved by NFPA or UL.

Hilti Firestop products are only approved firestop penetration products at VAMC.

- B. Penetrations must be located, marked, and sealed by Contractor responsible for penetration. As penetrations are sealed, COR must be contacted to inspect penetrations for proper sealing. Only one (1) type of fire sealant is permissible per penetration.
- C. To ensure that penetrations are sealed, Contractors must obtain Ceiling Access Permit from COR prior to work commencing. Permit shall be in this person's possession during work.
- D. When penetration work and fire sealant work is complete, sign and return permit to COR for subsequent inspection and verification.
- E. Photo-documentation in lieu of interim inspections can be performed to validate work.
- F. At end of each workday and prior to leaving work site, all openings in exterior walls must be covered to prevent weather, wind, rain, dust, etc from entering the wall cavity and interior rooms..
- G. If it is not practical to replace ceiling tiles daily, Contractor is to construct 7 feet tall by 5 feet wide metal stud and drywall tunnels through occupied spaces as deemed necessary by COR for access by VAMC personnel and maintaining construction operations. Upon first incident of Contractor not replacing ceiling tiles, this tunnel construction must commence immediately prior to further construction on project.

3.33 PROTECTION OF WORK & ADJACENT AREAS

- A. Refer to Specification Section 01 00 00 GENERAL REQUIREMENTS for additional details.
- B. Contractor to provide drop cloths, hard board, plastic, etc. when working in occupied areas to avoid staining or damaging existing brick walls, precast panels, windows, roof membrane and roof top equipment.
- C. The Contractor is required to preserve and protect structures, equipment, and vegetation on or adjacent to work site, which are not to be removed, and which do not unreasonably interfere with work required under contract. Contractor will be required to repair damage to facilities resulting from failure to exercise reasonable care in performing work.
- D. Any damage caused by Contractor's employees is to be reported to COR or Facilities Management Project Section immediately.

3.34 RESTROOM USAGE

- A. Contractors are to use public restrooms unless otherwise instructed to specific restrooms or portable facilities.
- B. Portable facilities are responsibility of Contractor.

3.35 SCHEDULING OF WORK

- A. Refer to Specification Section 01 32 16.15 PROJECT SCHEDULES for additional details.
- B. Schedule work areas with COR not less than three weeks in advance of commencement of work.
- C. The VA will require detailed workplans from Contractor for evolutions that require review/approval from other entities in VA (i.e., VA Police, Grounds, Logistics, etc.).
- D. Notification does not guarantee date of scheduled outage or service interruption however COR will schedule such dates and inform Contractor. Date will be scheduled with medical center personnel when service interruption will minimize affect to hospital patients and operations. Contractor to submit VA System Outage Request form to COR not less than three weeks in advance of intended commencement of outage work. Contractor shall attend two (2) weekly pre-outage meetings with Engineering and staff to coordinate actual date of outage, duration, time of outage, phasing, and affected services. In addition, Contractor shall attend pre-outage meeting one hour prior to outage to coordinate communications, readiness, pre-outage checklist, document requirements, temporary measures, lock out tag out and other outage requirements and procedures.
- E. Contractor shall attend weekly construction meetings.

3.36 SECURITY OF CONSTRUCTION SITES

- A. Refer to 01 00 00 Article 1.5 for additional Security details.
- B. All construction sites must be secured to prevent inappropriate access by patients, visitors, and employees. While such security fences, doors, and barricades are temporary, they must be substantially installed to control access to site. Existing security system (Pegasys/P2000 by Johnson Controls) must be extended to each construction access door. Each construction door must be provided with Card Reader and electric strike lock programmed to existing VA security system. Construction sites and security measures must be monitored

daily to ensure that security is maintained. COR will alert VA Police about construction project & site. At close of activity daily, before securing site or portions of site, ensure that there are no patients, visitors, or staff in area. If construction site problems arise, Contracting Officer and COR will take appropriate action to correct safety and security conditions up to and including Modification/Settlement by Determination deduction of \$2,500.00 per each event (or notice from Police) that construction area was left unsecured.

- C. Keys for access to construction/work areas may be issued to Contractor at discretion of COR. All keys will be assigned through SAM box, and Contractor will be given access based on their VA ID Card. Upon completion of work, failure to return issued keys to COR will result in issuance of Settlement by Determination in amount of \$100.00 for each outstanding key. In addition, \$50.00 fee will be paid to VA for each outstanding key. Keys are to be picked up and returned daily. If keys are not returned by end of day, modification of \$50.00/key per day will be assessed against Contractor.
- D. VA engineering, safety/fire department, and police staff must have right to access construction site always to perform their assigned responsibilities.
- E. Lock up worksite always to prevent patients and other unauthorized people from entering site. Contractors may lock up their tools etc., with personal locks.
- F. Materials: Secure on job site, or in separate COR-authorized storage space. Hallways shall not be used for storage. Contractors shall manage their storage areas and assure sites are kept clean and safe (OSHA standards apply).
- G. Any shared space(s) shall be accessible by Facilities Management. Do not block access to electric panels or fire protection equipment.
- H. The need for job site security is much greater when work is being conducted in psychiatric areas (Third Floor C Wing) to protect safety of patients. All job boxes, tools, etc., shall be locked up even when workers are on site unless there's enough activity to assure that patients cannot access tools or site. Verify that no one is in construction area upon locking up site for evening.
- I. Two evacuation routes from worksite shall be maintained always.

J. Access is limited to areas such as critical care and surgical units, as well as mechanical/electrical rooms, etc. Access can be obtained through Facilities Management.

K. VA Police reserve right to refuse access to anyone without prior authorization and identification.

3.37 SMOKING

A. The smoking policy at VAMC Milwaukee changed effectively January 1, 2019. Smoking IS NO LONGER BE PERMITTED ANYWHERE ON CAMPUS by contractor employees. Including grounds and roof areas. A copy of hospital smoking policy will be supplied upon request.

B. Violation of the VAMC Milwaukee smoking policy may result in worker being removed from worksite for duration of project.

C. The General Contractor is responsible for the enforcement of this no smoking policy.

3.38 STOP WORK

A. VA Safety and COR have Director's permission and authority to stop work whenever conditions pose imminent threat to life and health or threaten damage to equipment or buildings.

3.39 SUB-CONTRACTORS

A. The Contractor has responsibility to assure that all sub-contractors and their workers are properly trained and follow these specifications. Assistance from VA staff may be provided on case by case basis on technical issues.

B. The VA reserves right to approve of sub-contractor being used to complete project. A full list of sub-contractors working on contract to include names, phone numbers, email address and address shall be provided prior to mobilization.

C. Every sub-contractor is required to be fingerprinted and badged.

3.40 SUBMITTALS & SOLE SOURCE ITEMS

A. Refer to Specification Section 01 33 23 Shop Drawings, Product Data & Samples for additional details.

B. Start of Construction: Contractor's submittals shall be forwarded in enough time to permit proper consideration and approval by government and be timed to permit adequate lead time for procurement of contract required items. Delivery of submittals to COR or verbal acknowledgement of receipt by COR **does not** constitute approval. Pay attention to fact that pre-construction activities (submittals) are distinct from

construction and close-out activities with regards to overall period of performance.

- C. Sole Source Items: There will be no substitutions for products and services listed below. Sole source items to be in accordance with VAAR 852.236-90 Restriction on submission and use of equal products. This clause applies to following items:

<u>System / Equipment</u>	<u>Manufacturer and Model</u>
Fire Alarm System	Siemens Cerberus Pyrotronics System
Security System & Code Blue	Johnson Controls Pegasys/P2000 System
Doors, Hardware, Locks and Keying	Sargent Patented cylindrical and mortise sets with Medeco 7-pin interchangeable cylindrical cores, LCN Closers (Mechanical, Electronic Hold-Open, Electromagnetic), Sargent or Von Duprin Exit Devices, Hager Hinges
Modular Brick	Belden Brick (County Materials) Seal Brown Velour A, Modular Brick

3.41 SUPERINTENDENCE OF THE CONTRACT

- A. General Contractor shall appoint a full-time superintendent, employed by the General Contractor, to be responsible for the site supervision of the contract. The Government requires the contractor to dedicate 100% of the site superintendent's time to this contract during the Construction phase of the contract. The contractor shall not allow the site superintendent to oversee multiple contracts concurrently while any contract is in the Construction phase of the contract.

3.42 TRAFFIC CONTROL

- A. Contractors shall provide trained personnel and/or equipment, signage, barricades etc., to regulate traffic whenever construction operations affect traffic patterns.

3.43 TRENCHING: (NOT USED)

3.44 UNUSUALLY SEVERE WEATHER CONDITIONS

- A. Claims by the contractor for delay attributed to unusually severe weather in accordance with FAR 52.249-10 must be supported by climatological data covering the period and the same period for the 10 preceding years. When the weather in question exceeds in intensity or

frequency the 10-year average, the excess experienced shall be considered "unusually severe." Comparison shall be on a monthly basis. Whether or not unusually severe weather in fact delays the work will depend upon the effect of weather on the branches of work being performed during the time under consideration. Normal weather conditions in this region typically include freezing temperatures, snowstorms, rainfall, and other weather events that could delay certain exterior construction activities. Normal weather conditions are to be considered when bidding and preparing schedules.

3.45 WASTE MANAGEMENT

- A. Refer to Specification Section 01 74 19 CONSTRUCTION WASTE MANAGEMENT for additional details.
- B. Other specifications have requirements for waste, debris, discarded materials, unsuitable materials, and contaminated soil.

3.46 WORK SITE REQUIREMENTS

- A. Provide list of emergency contacts at entrance to construction site. This list shall include COR, Superintendent and VA Police contact information. See construction door sign template.
- B. Contractors are to maintain their work area as clean as possible while working and cleanup thoroughly daily.
- C. Prior to utilities or critical systems being interrupted, submit outage request in writing (via outage request form) at least two weeks prior to expected outage date. Submit outage request to COR. Only Facilities Management personnel may shut off utilities.
- D. All Contractors are expected to be courtesy. Loud, vulgar, abusive language, sexual harassment and aggressive behavior **will not be tolerated.**
- E. Contractors working above ceiling are required to replace disturbed ceiling tile by end of each day.
- F. Prior to making penetrations in walls, floors or ceilings, it is Contractor's responsibility to identify affected rated wall systems. Contractor shall also X-Ray concrete floors, masonry walls and Precast Concrete Panels to avoid embedded conduit or structural rebars.
- G. All repaired penetrations on rated wall systems must be completed using fire-rated material matching rating of wall system and must be inspected by COR before ceiling tiles are replaced or area is concealed.

- H. Temporary construction partitions of non-combustible materials shall be installed as required to provide fire rated and smoke tight separation between areas undergoing renovation and/or construction and adjoining areas that are occupied by facility.
- I. Exits for occupied areas of building including rooms, suites, corridors and floors shall not be blocked by construction or by construction materials. Exit may be blocked temporarily if it is unavoidable and adequate alternative measures are provided, such as signage, instructions to occupants and approved in advance by COR and VA Safety via ILSM process. ILSMs, if active, require daily inspections by Contractor to COR.
- J. Existing fire protection systems including fire alarm systems, smoke detection systems, and sprinkler systems shall not be altered except as required for alteration and/or renovation project. Any alteration to system shall be coordinated with COR. When sprinkler or fire and smoke detector systems are out of service for more than eight hours, be responsible to institute Fire Watch till systems are operational.
- K. Fire and/or smoke doors shall not be propped open or prevented from closing and latching. This includes Infection Control/Construction doors, mechanical equipment rooms and utility closet doors.
- L. Locate existing fire extinguishers and pull stations in areas of work.
- M. Fire hazard inspections shall be conducted daily by Contractor once construction starts and until work is turned back over to facility.
- N. All temporary electrical wiring and equipment used for construction shall be installed and used in accordance with pertinent provisions of NFPA 70 and National Electrical Code.
- O. Maintain construction site to permit access by fire department as necessary. Clear building construction areas of obstructions so that portions are accessible for fire department apparatus and permit emergency egress of patients and other personnel.
- P. All necessary precautions shall be taken by Contractor to prevent accidental operation of existing smoke detectors by minimizing amount of dust generated in vicinity of smoke detectors. Any activity that may generate dust or smoke shall be reviewed with COR and Infection Control nurse.
- Q. Apprentices are authorized to work on projects disciplines providing following requirements are met:

1. Completion of OHSA-10 training and certification turned in as required for other workers.
 2. Apprenticeship documentation turned into contracting and continued direct supervision by journeyman.
 3. Apprentices are not allowed to work at Clement J Zablocki VA Medical Center on their own nor without continuous direct supervision.
- R. When plastic is allowed for use as construction barriers it will only be able to be in place for five (5) continuous calendar days, including days not worked such as weekends.

APPENDIX - STANDARD REQUIRED FORMS / TABLES / MATRICES

- A. **Contractor's Impact Statement** - Completed and signed by contractor and sub-contractor working on project *prior to start of their construction*. It is Contractor's responsibility to update this list monthly to COR for new sub-contractors working on contract.
- B. **Contractor's Checklist** - Completed and signed by General Contractor *prior to start of construction*.
- C. **Daily Log of Construction** - Completed daily by Contractor and scanned in and *posted to Buzzsaw weekly*.
- D. **Daily Intermediate Life Safety Measures (ILSM) Inspection Form** - Completed daily by Contractor and scanned in and *posted to Buzzsaw weekly (as required)*.
- E. **Construction Door Template** - Prepared by Contractor for posting on construction door. Submit to COR for approval prior to posting.
- F. **Construction Barrier and Fire Risk Assessment Matrix** - This table lists the descriptions of Type A, B, C and D construction activities and the precautions required for each. Follow on tables show the Patient Risk Groups and combined matrix.
- G. **SAC FORM** - Each contractor working on the contract shall have a completed SAC form on file with the COR.
- H. **ILSM Temporary Barrier and FIRESTOP Tags** - GC to request when fire-rated assemblies have penetrations.

CONTRACTOR'S IMPACT STATEMENT

System	Possible Interruption	Possible Effect to Patients
Electrical	- Changing position of switches and breakers - Cutting or splicing into wires - Disconnecting wires/terminals - Disturbing Junction Boxes/ Electrical Panels - Core Drilling - Demolition of walls - Excavation	- Electrical Systems provides LIFE SUPPORT (Directly and Indirectly) - Can cause DEATH to critical patients
Water Lines	- Turning valves - Cutting into lines - Demolition & Excavation	- Dialysis, OR, HVAC, ICU, X Ray, etc. - Can cause DEATH to critical patients - Infection Control and Major Cleanup issues
Medical Gases - Oxygen - Air - Vacuum - Nitrous Oxide - Nitrogen	- Cutting or disturbing into lines (labeled, unlabeled) - Changing valve positions - Deactivating alarms - Demolition & Excavation	- Oxygen, vacuum, air, etc. in ICU, OR, Med/Surg. - Can cause DEATH to critical patients
HVAC	- Shutting down - Modifying - Changing controls - Cutting into roof - Producing foul odors near intakes - Cutting into chilled water lines - Obstruct fresh air intake	- Temperature is critical in OR, ICU, etc. - Infection Control and Major Air Quality Issues
Fire Alarm and Sprinklers	- ANY modifications	- Compromising Fire Safety - False Alarms

	- Covering/removing smoke heads - Demolition & Excavation of utilities - Damage/activate sprinkler heads - Duct work modifications	- Floods - Major disruptions and distractions ALL THE ABOVE CAN RESULT IN DEATH
Code Alarms Nurse Call Wander Guard	- Demolition & Excavation - Unplugging - Changing position of switches/breakers	- Lack of communicating system can result in patient death or injury

IF THERE IS ANY QUESTION REGARDING ANY OF THE INFORMATION ON THIS DOCUMENT,
IMMEDIATELY CONTACT FACILITY MANAGEMENT OR VA SAFETY OFFICE TO RESOLVE ISSUES
PRIOR TO WORK COMMENCEMENT.

Contractor Name

Company

Signature / Date

CONTRACTOR CHECKLIST

This agreement is between _____ and _____

Project Name (ref. #) _____

Project Start _____; Work Allowed Between _____ and _____

Before performing work on facility premises, outside Contractors must read this checklist and comply with local, state, federal and facility safety policies.

1.0 Life Safety Will Contractor compromise part during Life Safety System of this facility (ceiling tiles, penetrations in smoke or fire walls, blocking exits, shutting down fire/smoke detection or fire suppression, etc.)?

Y N If yes, describe in detail:

1.1 ILSM Are Interim Life Safely Measures necessary?

Y N If yes, provide plan/sketch for review/approval.

2.0 Services Will there be compromises to patient services during work performed?

Y N If yes, describe in detail:

2.1 What adjustments need to be implemented to minimize impact to residents, visitors and staff?

Describe:

3.0 Chemical: Will hazardous chemicals (liquids or gases) be used on-site?

Y N If yes, what risks do they create for facility staff? Is there chance of exposure?

3.1 Are there facility chemicals being used, stored or handled where Contractor will be working?

Y N If yes, has Contractor been informed by issuing SDS's?

4.0 Hot Work Will Contractor use equipment which will generate open flames, sparks or other ignition sources?

Y N If yes, **Fire Watch will** be necessary to be posted during Hot Work activities

4.1 Will flammable chemicals be in area?

Y N If yes, describe in detail:

5.0 Confined Spaces Does work involve entry into confined space?

Y N If yes, retain copy of Contractor's Confined Space Entry program (and CSE Permit if needed).

6.0 Lockout/Tagout Does work involve maintenance on energized equipment or systems?

Y N If yes, retain copy of Contractor's LOCKOUT/TAGOUT program.

6.1 Is there impact to residents, visitors, or staff during this procedure?

Y N If yes, describe impact, ways to minimize impact and who has been notified.

7.0 Unsafe Conditions/ Impact to Residents, Visitors and Staff Are there unusual or unsafe conditions which need to be addressed and/or communicated to facility staff, visitors or residents?

Y N If yes, describe.

8.0 List departments/areas in which you will be working.

8.1 List potential hazards to you/your workers in areas in which you are working:

8.2 List specific problems that can arise if wrong actions are taken in area in which you are working.

9.0 Safety Officer Contact Person:

Facility COR:

First Aid Plan:

Fire Plan:

Disaster Plan:

Restricted Access:

10.0 Restricted Areas Construction workers are allowed in following areas of hospital.

(Contractor Supt / Safety Officer)

(Facility COR)

Date: _____

Date: _____

Milwaukee VAMC
695-22-121 VAMKE Bldg 111 Façade Repair
Milwaukee, WI 53295

100% Bid Documents
March 16, 2026

DAILY LOG OF CONSTRUCTION				M	T	W	Th	F
				PROJECT:				
BUILDING / LOCATION				CONTRACT NO. VA69D-			DATE	
CONTRACTOR				CONTRACTOR SUPERINTENDENT				
WEATHER (<i>Rain, Snow, Cloudy, Windy, etc., OR NA if indoors</i>)			TEMP. High Low	SITE CONDITIONS (<i>CLEAN, DEBRIS, DUST, ETC.</i>)				
NO. CONTRACTOR'S MEN BY JOB CATEGORIES				NO. SUB-CONTRACTOR'S MEN BY JOB CATEGORIES				
EQUIPMENT ON JOB		No.	Working	MATERIALS DELIVERED				
Brief description of size		Units	Yes					
				OFFICIAL VISITORS TO JOB SITE				
STATUS OF WORK ITEM Brief description of work in progress, questionable performance, NO. unforeseen developments on job etc. Include tests made and samples taken.								
STATUS OF INFECTIOUS CONTROL MEASURES (NEGATIVE AIR FLOW, CLEAN WALK OFF MAT, ANTE-ROOM SECURE,)								

NEGATIVE AIR FLOW PRESSURE READING: _____

SAFETY COMMENTS

DIFFICULTIES WITH CONTRACTOR OR REPRESENTATIVE

UNFORESEEN DEVELOPMENTS ON JOB CONTINUED *(Describe conditions, action taken; person contacted, recommended actions)*

SIGNATURE

TITLE

PROJECT SUPERINTENDENT

Daily Intermediate Life Safety Measures (ILSM) Inspection Form FORM QCA-01A

INSTRUCTIONS: This form is to be utilized when significant hazards posed by existing NFPA 101 deficiencies or construction activities are in progress. ILSM must be implemented upon project start and continuously enforced through project completion to provide level of life safety comparable to that described in Chapter 1-7, 31 and applicable occupancy chapters of Life Safety Code. WHERE APPLICABLE NOTE EXCEPTIONS ONLY OF AREA IDENTIFIED AS BEING DEFICIENT DURING INSPECTION AND EXPLAIN IN SUFFICIENT DETAIL IN COMMENTS SECTION OF THIS FORM. TURN COMPLETED FORMS INTO THE LHS SAFETY OFFICER.

WEEKLY ILSM FORM							
PROJECT:							
ILSM DESCRIPTIONS	MON	TUE	WED	THR	FRI	SAT	SUN
DATES							
1. Are exits readily accessible and provide unobstructed egress?							
2. If required, due to inaccessibility of existing, have alternate exits been established?							

WEEKLY ILSM FORM							
PROJECT:							
ILSM DESCRIPTIONS	MON	TUE	WED	THR	FRI	SAT	SUN
DATES							
3. If alternate exists have been established, are personnel in area informed and aware of their relocation and existence?							
4. Are existing and relocation exits clearly identified and able to be seen in event of emergency or fire?							
5. Are fire evacuation routes posted, and do they reflect up-to-date changes and alternate escape routes due to construction deficiencies?							
6. Are written procedures and guidelines posted in immediate and adjacent areas for what to do and who to call in event of fire or emergency?							
7. Are personnel in immediate and adjacent areas aware and informed as to procedures and guidelines to follow in event of fire or emergency?							
8. Do fire alarms, detection, and suppression equipment and systems appear to be operational?							

WEEKLY ILSM FORM							
PROJECT:							
ILSM DESCRIPTIONS	MON	TUE	WED	THR	FRI	SAT	SUN
DATES							
9. If fire alarm or suppression systems are impaired or temporarily made nonfunctional has fire watch, as required or necessary, of area been established?							
10. If existing fire alarm or suppression systems/equipment are impaired, have measures been taken to provide equivalent equipment/systems for adequate protection? Note date of installation for equivalent measures to right.							
11. If fire alarm or suppression systems are impaired, are temporary equipment/systems being inspected and tested at least monthly?							
12. If temporary fire alarm or suppression systems are installed, are personnel in area aware and informed on how to operate or utilize in event of fire or emergency?							
13. Has "No Smoking" policy been posted, implemented and enforced in construction area?							

WEEKLY ILSM FORM							
PROJECT:							
ILSM DESCRIPTIONS	MON	TUE	WED	THR	FRI	SAT	SUN
DATES							
14. Are construction/remodel area storage, waste and debris being maintained to minimize potential for fire or safety hazards during daily operations?							
15. Are temporary partitions built to be smoke tight and of noncombustible/fire retardant materials to minimize spread of smoke or fire within building?							
16 Do electrical panels, temporary wiring, extension cords, tools and equipment appear to be installed, utilized, and functioning in safe manner?							
17. In general, are exterior construction site, buildings, and ground free of hazard and potential safety violations?							
18. If there is gas/arc welding or cutting being performed within building or on site, have additional fire safety precautions been taken and necessary equipment provided and utilized?							
19. If there is gas/arc welding or cutting being performed within building or on site,							

WEEKLY ILSM FORM							
PROJECT:							
ILSM DESCRIPTIONS	MON	TUE	WED	THR	FRI	SAT	SUN
DATES							
has Plant Operations department been notified?							
20. If there are hand and safety rails required, are they in place and maintained in good condition?							
21. Are extension cords that are being used 3 wire grounded type?							
22. If there are temporary electrical outlets provided, do they have ground fault protection at receptacle or at panel?							
23. I f hazardous chemicals are present and/or being used, are they being limited to amount needed and used daily?							
24. Are MSDS sheets readily available for hazardous chemicals that are present or being used?							
25. Do ladders and scaffolds appear to be in satisfactory condition and being utilized in safe manner?							
26. Is personnel protective equipment, such as safety glasses, hard hats etc. needed or required and being used?							

Milwaukee VAMC
 695-22-121 VAMKE Bldg 111 Façade Repair
 Milwaukee, WI 53295

100% Bid Documents
 March 16, 2026

WEEKLY ILSM FORM							
PROJECT:							
ILSM DESCRIPTIONS	MON	TUE	WED	THR	FRI	SAT	SUN
DATES							
27. If infection control is required, are appropriate policies and procedures known and being followed?							
28. If electrical equipment needs to be de-energized, are applicable "Lockout/Tagout" procedures being followed?							
PLACE INITIALS OF PERSON PERFORMING DAILY INSPECTION TO THE RIGHT.							

Inspection Results week of:

Project #

Contractor:

COR

CONSTRUCTION DOOR TEMPLATE

Construction Contacts Emerg / Proj Info 8.5 x 11 page See Following Page	Access Control Signs 8.5 x 11 page Area Closed as we improve VA for Veterans NO ENTRY WITHOUT Appropriate PPE AND SAFETY TRAINING SIGN IN WITH SUPERINTENDENT Under Construction - Do Not Enter Hard Hat, Steel Toes & Safety Glasses Required. Contact COR for admittance.
ICRA PERMIT HERE	ILSM HERE

EMERGENCY CONTACTS

Project name:

Project number:

Emergency Police, Fire and Rescue

Your current location is...

VAMC 5000 W National Ave, Milwaukee WI.

Building

Room

IF INSIDE: VA Phone....Dial 911

Indicate nature of the emergency

IF OUTSIDE: Personal Cell Phone....Dial 911, then call VAPD 414-384-2000 x42222

Indicate location and that 911 has been called

For Unexpected Utility Discovery/Interruption:

VA Phone: x41010 (FM-Graphics)

414-384-2000 x41010 from personal cell phone

VA Project Manager Name:

Phone 1	<u>Phone 2</u>
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Contractor Key Personnel:

Site Superintendent (1)/SSHO:

Name	Phone
------	-------

Site Superintendent (2)/SSHO:

Name	Phone
------	-------

Contractor's Project Manager:

Name	Phone
------	-------

No entry without appropriate PPE and Safety training. Sign in with Superintendent.

Construction Barrier and Fire Risk Assessment Matrix

TYPE A Minimal Fire Risk	Inspection and Non-Invasive Activities. Includes, but is not limited to: ▪ Removal of ceiling tiles for visual inspection limited to 1 tile per 50 square feet ▪ Painting (but not sanding) ▪ 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. ▪ Removal of floor tile less than 25 square feet, non-ACM and no grinding or dust generating activities
TYPE B Limited Fire Risk	Small scale, short duration activities that can be completed within 3 calendar days. Work that requires a moderate level of demolition and does not pose a potential fire hazard. Cutting/burning operations that require a burn permit are prohibited. No electrical corded power tools permitted. Includes, but is not limited to: ▪ Installation of telephone and computer cabling ▪ Access to chase spaces ▪ Asbestos abatement of flooring tile/mastic removal, glove bag operations, Transit panel removals ▪ Duct work, electrical, plumbing, piping work above ceiling within a 50-square foot area. ▪ Cutting of walls or ceiling where fire hazard is minimal. ▪ Sanding of walls for painting or wall covering ▪ Removal of floor coverings, ceiling tiles and casework
TYPE C Moderate Fire Risk	Work that requires a moderate to high level of demolition, cutting/burning operations or requires demolition or removal of any fixed building components or assemblies. Power corded tools and work that provides a potential fire hazard. Includes, but is not limited to: ▪ Removal of building components or elements requiring use of open flame or power chisel ▪ New construction or renovations over 3 days' duration ▪ Major duct work, plumbing, piping, or electrical work ▪ Soldering or brazing operations ▪ ANY activity that requires a burn permit

TYPE D Significant Fire Risk	Major demolition and construction projects involving cutting/burning operations or require demolition or removal of any fixed building components or assemblies. Power corded tools and work that provides a potential fire hazard. Includes, but is not limited to: ▪ Activities which require consecutive work shifts ▪ Requires heavy demolition or removal of a complete building system ▪ New construction or renovations over 3 days' duration
---	--

Patient Risk Group - VAMC Milwaukee

Low Risk	Medium Risk	High Risk	Highest Risk
Office areas Warehouse	Cardiology Echocardiography Endoscopy Physical Therapy Respiratory Therapy Outpatient Mental Health Outpatient Clinics Simulation Lab Comp and Pen	Emergency Room Laboratories (specimen) Linen Kitchen & Canteen Radiology/MRI Nuclear medicine Physical Therapy Tank Area	Any area caring for immuno-compromised patients Pharmacy Cardiac Cath Lab / EP Lab Logistics Supply Central Sterile Supply Intensive Care Units Medical / Mental Health Unit Negative Pressure Isolation Rooms Oncology / Radiation Oncology Inpatient and Outpatient ORs Dialysis Surgical Units Post Anesthesia Care Unit APC Unit Sterile Processing Services

**IC Matrix – Class of Precautions: Construction Project by Patient
 Risk**

Patient Risk Group	Construction Project Type			
	TYPE A	TYPE B	TYPE C	TYPE D
LOW Risk Group	I	II	II	III/IV
MEDIUM Risk Group	I	II	III	IV
HIGH Risk Group	I	II	III/IV	IV
HIGHEST Risk Group	II	III/IV	III/IV	IV

Milwaukee VAMC
695-22-121 VAMKE Bldg 111 Façade Repair
Milwaukee, WI 53295

100% Bid Documents
March 16, 2026

SAC-SPECIAL AGREEMENT CHECK
For Construction Contractors

NAME:

(Last Name)

(First Name)

(Middle Name/none)

CITIZENSHIP: _____ SSN: _____ DOB: _____

ALIAS/none: _____ RACE: _____ SEX: _____

EYE COLOR: _____ HAIR COLOR: _____ HT: _____ WT: _____

PLACE OF BIRTH:

(City / State / Country)

RESIDENT ADDRESS:

SCARS, MARKS, TATTOO(S)/none:

TRADE/DISCIPLINE: _____ APPRENTICE / JOURNEYMAN /

MASTER / NA

(Circle one)

Contractor Information

PO#: 695-_____ Contract Expiration Date:

Project Name: _____ Contract#: VA69D-

Milwaukee VAMC
695-22-121 VAMKE Bldg 111 Façade Repair
Milwaukee, WI 53295

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March 16, 2026

Prime Contractor:

Prime Address:

Employing Sub-Contractor:

Sub-Contractor Address:

If privately owned vehicle is or will be, even once, parked on grounds

Driver's License#: _____ Plate#: _____
_____(_____)_____

(state)

Vehicle: Make: _____ Model: _____ Year: _____ Color: _____

Computer Access Required for Contract? __ Y / N __
Needed? __Y / N __

Construction Door Access

Construction Door Name/Address:

Printed COR Name / COR Signature / Date

ILSM TEMPORARY BARRIER TAG	
PROJECT:	
PRIME CONTRACTOR:	
SUB CONTRACTOR:	
EMERGENCY CONTACT NO.	
BARRIER INSTALLATION DATE:	
BARRIER EXPIRATION DATE:	
	(MAX 3 DAYS)

ILSM FIRESTOP	
PROJECT:	
PRIME CONTR:	
CORE CONTR:	
PENETRATION DATE:	
EXPIRATION DATE:	
	(MAX 30 DAYS)

- - - E N D - - -

SECTION 01 32 16.13
NETWORK ANALYSIS SCHEDULES

PART 1- GENERAL

1.1 DESCRIPTION:

- A. Contractor shall develop a Project Schedule Critical Path Method (CPM) plan and schedule demonstrating fulfillment of the contract requirements, shall keep the network 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 will be utilized to satisfy both time and cost applications. All schedule data and reports required under this specification section shall be based upon regular total float, not relative total float schedules. No construction work for this contract can begin until project schedule is approved by the VA.

1.2 CONTRACTOR'S REPRESENTATIVE:

- A. The Contractor shall designate an authorized representative in the firm who will be responsible for the preparation of the project schedule, review and report progress of the project 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 and such authority shall not be interrupted throughout the duration of the project.
- C. The Contractor's representative shall engage the services of an outside consultant. Consultants deemed pre-approved by VA: CCS/OS, Chicago, IL; Spire Consulting Group, Austin, TX.

1.3 CONTRACTOR'S CONSULTANT:

- A. The Contractor shall submit a qualification proposal to the COR within ten (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, 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 employment of the proposed consultant and will notify the Contractor of the VA decision within seven (7) calendar days from receipt of information. In case of disapproval, the Contractor shall resubmit another consultant within 10 calendar days for renewed consideration. The Contractor must have their CPM Consultant approved prior to submitting any schedules for approval.
- C. The Contractor is in charge and is responsible for the construction schedule. If the contractor has the software and expertise's to meet ALL specification requirements to complete an accurate schedule, they can submit a request to produce the schedules in-house to the CO and COR for review. If the Contractor does not have the required expertise, and software the CO will reject it. The Contractor shall then submit qualifications of an outside scheduling consultant for approval. No additional time will be given.

1.4 COMPUTER PRODUCED SCHEDULES

- A. The contractor shall provide monthly schedules to the 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 Primavera (P3 or P6) to the contracting officer's representative; a hard copy listing of all project schedule changes, and associated data, made at the update and an electronic file of this data in Primavera (P3 or P6) batch format; and the resulting monthly updated schedule in a compressed electronic file. These must be submitted with and substantively support the contractor's monthly payment request and the signed look ahead report.
- B. The contractor is responsible for the correctness and timeliness of the computer-produced reports. The Contractor is 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 shall report errors in computer-produced reports to the Contractor's representative within ten (10) calendar days from receipt of reports. The Contractor will reprocess and resubmit the computer-produced reports, when requested by the Contracting Officer's

representative, to correct errors which affect the payment and schedule for the project.

1.5 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 complete project schedule on sheets of paper 30 x 42 inches and an electronic file in a compressed PDF format. 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, duration, predecessor and successor relationships, trade code, area code, description, 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 and 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 project schedule. 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 a zero duration. The complete working project 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 project schedule 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 1.5, ADJUSTMENT OF CONTRACT COMPLETION.

- B. Within 30 calendar days after receipt of the complete project schedule, the Contracting Officer or their 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 project schedule and the corresponding computer-produced schedule(s) shall constitute the approved baseline schedule until subsequently revised in accordance with the requirements of this section.

1.6 WORK ACTIVITY/EVENT COST DATA

- A. The Contractor shall cost load all work activities/events except procurement activities. The cost loading shall reflect the appropriate level of effort of the work activities/events. The cumulative amount of all cost loaded work activities/events (including alternates) shall equal the 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. In the event of disapproval, the Contractor shall revise and resubmit in accordance with Article, COMPLETE PROJECT SCHEDULE SUBMITTAL. 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 the FAR 52.232 - 5 (PAYMENTS UNDER FIXED-PRICE

CONSTRUCTION), Article, and VAAR 852.236 - 83(PAYMENTS UNDER
FIXED-PRICE CONSTRUCTION).

- C. In accordance with Article PERFORMANCE OF WORK BY THE CONTRACTOR in FAR 52.236 - 1 and VAAR 852.236 - 72, 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. The sum of the cost loading for each bid item work activities/events shall equal the value of the item in the Contractors' bid.
- E. Work activities/events for Contractor bond shall have a trade code and area code of BOND.

1.7 PROJECT SCHEDULE REQUIREMENTS

- A. Show on the project schedule the sequence and interdependence of work activities/events required for complete performance of all items of work. In preparing the project schedule, the Contractor shall:
 - 1. Exercise sufficient care to produce a clear, legible, and accurate project schedule. Refer to drawing CPM-1 (Sample CPM Network). Computer plotted project schedules shall legibly display and plot all information required by the VA CPM activity/event legend or the computer plotted project schedule will not be acceptable. If the computer plotted project schedule is not found acceptable by the contracting officer's representative, then the project schedule will need to be hand drafted and meet legibility requirements. Group activities related to specific physical areas of the project, on the project schedule for ease of understanding and simplification. Provide a key plan on each project schedule sheet showing the project area associated with the work activities/events shown on that sheet.
 - 2. Show the following on each work activity/event:
 - a. Activity/Event ID number.
 - b. Concise description of the work represented by the activity/event. (35 characters or less including spaces preferred).
 - c. Duration in workdays.
 - d. Cost (in accordance with Article, ACTIVITY/EVENT COST DATA of this section and less than \$9,999,999 per activity).

- e. Work location or area code (five characters or less), descriptive of the area involved.
 - f. Manpower required (average number of men per day).
3. Show activities/events such as:
- a. Contractor's time required for submitting shop drawings, templates, fabrication, delivery and similar pre-construction work.
 - b. Contracting Officer's and Architect's review and approval of shop drawings, equipment schedules, samples, template, or similar items.
 - c. Interruption of VA Medical Center 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. Schedule these activities/events so that only one phase is scheduled for completion within the same 30 consecutive calendar day period (except for those phases immediately preceding the final acceptance). Maintain this scheduling condition throughout the length of the contract unless waived by the Contracting Officer's representative in writing.
 - f. Bid items other than the Base Bid (ITEM 1) item shall have trade codes corresponding to the appropriate bid item number (e.g., ITM 3, ITM 4 and other items).
4. 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.
5. Break up the work into activities/events of durations no longer than 20 workdays each, except as to non-construction activities/events (i.e., procurement of materials, delivery of equipment) and any other activities/events for which the Contracting Officer may

approve the showing of a longer duration. The duration for VA approval of any required submittal, shop drawing, or other submittals shall not be less than 20 workdays. Refer to drawing CPM-1 for VA approval activities/events which will require minimum duration longer than 20 workdays. The construction time as determined by the CPM schedule from early start to late finish for any sub-phase, phase or the entire project shall not exceed the contract time(s) specified or shown.

6. 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.
7. Uniquely number each activity/event with numbers ranging from 1 to 99998 only. The project schedule should be generally numbered in such a way to reflect either discipline, phase or location of the work.
8. The following inspections shall be added to the CPM:

#	Inspections
1	Pre-construction meeting
2	Test panel review
3	Test panel re-review
4	Phase I progress
5	Phase I progress
6	Phase I substantial completion (Phase 1)
7	Phase II progress
8	Phase II progress
9	Phase II substantial completion (Phase 2)
10	Phase III progress
11	Phase III progress
12	Phase III substantial completion (Phase 3)
13	Phase IV progress
14	Phase IV progress
15	Phase IV substantial completion (Phase 4)
16	Final inspection

Random inspections by the Architect and VA with photo documentation of work will occur and be reviewed at weekly meetings.

- B. Submit the following supporting data in addition to the project schedule, activity/event ID schedule and electronic file (s). Failure of the Contractor to include this data will delay the review of the submittal until the Contracting Officer is in receipt of the missing data:
1. The proposed number of working days per week.
 2. The holidays to be observed during the life of the contract (by day, month, and year).
 3. The planned number of shifts per day.
 4. The number of hours per shift.
 5. List the major construction equipment to be used on the site, describing how each piece relates to and will be used in support of the submitted project schedule work activities/events.
 6. Provide a typed, doubled spaced, description, at least one page in length, of the plan and your approach to constructing the project.
- C. 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 Contracting Officer's approval of the project schedule.
- D. Submit to the VA COR an electronic file(s) containing one file of the data required to produce a produced schedule, reflecting all activities/events of the complete project schedule being submitted.

1.8 PAYMENT TO THE CONTRACTOR:

- A. Monthly, the contractor shall submit 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 (PAYMENTS UNDER FIXED-PRICE CONSTRUCTION), and VAAR 852.236 - 83 (PAYMENTS UNDER FIXED-PRICE CONSTRUCTION). The Contractor is entitled to a monthly progress payment upon approval of estimates as determined from the currently approved updated computer-produced calendar-dated schedule unless, in special situations, the Contracting Officer permits an exception to this requirement r a listing of all

project schedule changes, and associated data, made at the update; and an electronic file (s) of the resulting monthly updated schedule. These must be submitted with and substantively support the contractor's monthly application and certificate for payment request documents.

- B. When the Contractor fails or refuses to furnish to the Contracting Officer the information and schedule in electronic format, which, in the sole judgment of the Contracting Officer, is necessary for processing the monthly progress payment, the Contractor shall not be deemed to have provided an estimate and supporting schedule data upon which progress payment may be made.

1.9 PAYMENT AND PROGRESS REPORTING

- A. Monthly job site progress meetings shall be held on dates mutually agreed to by the COR and the Contractor. Contractor and the CPM consultant will be required to attend all monthly progress meetings. Presence of Subcontractors during progress meeting is optional unless required by the Contracting Officer (or Contracting Officer's representative). The Contractor shall update the project schedule and all other data required by this section shall be accurately filled in and completed prior to the monthly progress meeting. The Contractor shall provide this information to the COR in completed form three workdays in advance of the progress meeting. Job progress will be reviewed to verify:
1. Actual start and/or finish dates for updated/completed activities/events.
 2. Remaining duration, required to complete 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 and computer-produced schedules. Changes in activity/event sequence and duration which have been made pursuant to the provisions of following Article, ADJUSTMENT OF CONTRACT COMPLETION.
 4. Percentage for completed and partially completed activities/events.
 5. Logic and duration revisions required by this section of the specifications.
 6. Activity/event duration and percent complete shall be updated independently.

- B. The Contractor shall submit a narrative report as a part of his monthly review and update, in a form agreed upon by the Contractor and the Contracting Officer. The narrative report shall include a description of problem areas; current and anticipated delaying factors and their estimated impact on performance of other activities/events and completion dates; and an explanation of corrective action taken or proposed. This report is in addition to the daily reports pursuant to the provisions of Article, DAILY REPORT OF WORKERS AND MATERIALS in the GENERAL CONDITIONS.
- C. After completion of the joint review and COR's approval of all entries, the contractor will 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.
- D. After completing the monthly schedule update, the contractor's 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 COR for the contract change(s). When there is a disagreement on logic and/or durations, the consultant shall use the schedule logic and/or durations provided and approved by the COR. 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 COR 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 project schedule is approved, the contractor must recreate all manual progress payment updates on this approved project schedule 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.
- E. After VA acceptance and approval of the final CPM project schedule, the contractor shall submit to COR and Contracting Officer three blue line

copies of a revised complete project schedule showing all completed and partially completed activities/events, contract changes and logic changes made on the intervening updates or at the first update on the final diagram. The Contracting Officer may elect to have the contractor do this on a less frequent basis, but it shall be done on a quarterly basis as a minimum.

- F. 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 monthly progress review meeting or the monthly computer-produced calendar-dated 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 specification requirements.
- B. Prior to proceeding with any of the above actions, the Contractor shall notify and obtain approval from the Contracting Officer for the proposed schedule changes. If such actions are approved, the CPM 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 PROJECT SCHEDULE AND SCHEDULE

- A. Within 30 calendar days after VA acceptance and approval of any updated computer-produced schedule, the Contractor will submit a revised electronic project schedule, the associated files 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 indicate an extension of the project completion by 20 working days or 10 percent of the remaining project duration, whichever is less. Such delays 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 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 of the project schedule 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 Medical Center, contract phase(s) and sub phase(s), utilities furnished by the Government to the Contractor, or any other previously contracted item, must 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 Article, FAR 52.243 -4 (CHANGES), VAAR 852.236 - 88 (CHANGES - SUPPLEMENTS) 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 Contracting Officer 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 Article, FAR 52.243 -4 (CHANGES), VAAR 852.236 - 88 (CHANGES - SUPPLEMENTS). 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 project schedule.

- D. All delays due to non-work activities/events such as RFIs, WEATHER, STRIKES, and similar non-work activities/events shall be analyzed on a month-by-month basis.

1.13 Construction Schedule Risk Analysis / Mitigation Plan

- A. Schedule Risk **Analysis** - The contractor shall conduct the statistical schedule risk analysis based on the above detailed construction activities in the Day 1 approved diagram, identifying major schedule risk areas and recommended risk mitigation plans as outlined below.
- B. The risk analysis shall be conducted by a person or firm skilled in the statistical method of schedule risk analysis based on the (PDM) network techniques for major construction projects, preferably in the major health care related projects. The cost of this service shall be included in the Contractor's proposal.
- C. The Contracting Officer has the right to approve or disapprove the Person or firm designated to perform the risk analysis.

1.14 Risk Analysis Format / Requirements / Submittals

- A. Risk Analysis Software / Format - Within 45 calendar days after receipt of Notice to Proceed, the Contractor shall submit for the Contracting Officer's review: a Risk Analysis software to be utilized, the method of performing the analysis, the format of presenting the data and the reports for VA approval.
- B. Conduct Risk Analysis / Submittals - Based on the approved software / format, the consultant shall perform statistical risk analysis on the detailed approved Day 1 diagram. The contractor shall review and utilize any previous Risk analysis performed by the A/E of record based on the "semi-detailed" (yet at an overall level) construction logic and schedule to ensure the continuity of previous schedule risk analysis. The contractor's project manager and Superintendent shall identify the major schedule risk areas and possible risk mitigation strategy/plan and record it in a narrative format, with electronic file submission to the VA. The risk analysis exercise shall be performed or updated at least on a quarterly basis or as directed by the VA Contracting officer.
- C. The submittal shall include three copies of a computer-produced risk analysis results, predicting the various meaningful probability curves of achieving the contract schedules. It shall also include a detailed narrative list of all major and minor potential and specific schedule

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and cost risk areas, and a contractor's recommendations of mitigating the identified risks which must be addressed by the VA Project and COR teams to maintain the contract schedule.

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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.
- 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. 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.
- C. 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 are constructed to establish standards by which the ensuing work can be judged.

- D. Design Data: Calculations, mix designs, analyses, or other data pertaining to a part of work.
 - E. 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.
 - F. 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.
 - G. 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.
 - H. 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.
 - I. 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.
- Closeout Submittals: Documentation necessary to properly close out a construction contract. For example, Record Drawings and as-built drawings. Also, submittal all requirements necessary to properly close out a phase of construction on a multi-phase contract.

1.3 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.

1.4 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.
- E. Official Submittal Register for project shall be via an online service contracted separately by the government, called OpCenter. Contractor shall utilize OpCenter per instructions from COR on its usage.

1.5 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. Resubmittals (due to rejection or conditional reasons) will automatically be categorized by the VA-approved submittal file transfer system (OpCenter)
 - 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)
_____Make Corrections as noted and resubmit
_____Rejected
SIGNATURE: _____
TITLE: _____
DATE: _____

1.6 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 contents.
- 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. GC shall use VA-approved FTP site (OpCenter) for submittals.
- 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.

1.7 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 may be requested back for use in the project after being reviewed and approved.

1.8 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.

1.9 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.

1.10 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 each submittal begins when VA COR receives the submittal from contractor and forwards to AE.
- C. Period of review for each resubmittal is the same as for initial submittal.
- D. AE review period is 14 calendar days for GC-uploaded submittals. VA review period is 30 calendar days for AE reviewed submittals.
- E. Period of review for each RFI begins when the VA COR receives the RFI from the contractor and forwards to the AE. AE review period is 7 calendar days for GC-uploaded RFIs. VA review period is 14 calendar days for AE-reviewed RFIs. The AE' and VA's review period of any uploaded RFI's from the GC received after 11:59 am on a Friday and/or day before a holiday will start 7:00 am of the first day VA FM is open for business.
- 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. "Conditionally Approved as Noted; No Resubmittal Required": Authorizes the Contractor to proceed with the work covered provided the Contractor incorporates the noted comments and makes the noted corrections.
 - 3. "Conditionally Approved as Noted; Resubmittal is Required". Contractor shall proceed with the work covered provided the Contractor incorporates the noted comments and makes the noted corrections. The Contractor shall RESUBMIT those portions noted by the returned submittal.
 - 4. "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.
 - 5. "Received", Indicates VA has received the submission and has no comment.

G. Requests for Information (RFIs):

1. Fully functional systems in every trade are intended through the full set of contract documents (Scope of Work, Drawings, and Specifications, and FAR and VAAR clauses).
2. RFIs will be considered and answered as "Clarifications only - no modification" unless for significant unforeseen hidden atypical conditions not normally encountered at this site (per FAR 52.236-2 Differing Site Conditions (APR 1984)), and where design intent is impossible to build. At this site, hidden condition locations (e.g., above-ceilings, behind chase walls, and below ground) typically contain obstructions, abandoned unmarked utilities and debris, and equipment not shown on plans. Provide work around such conditions, such as minor offsets to new routings, temporary supports, and reasonable modifications to existing conditions not detailed on plans.
3. Examples of situations to be considered "Clarification only - no modification" are those that should have been readily apparent during bidding, and may include situations now covered in the new clause VAAR 852.236-71 Specifications and Drawings for Construction (APR 2019):
 - a. Where new work connects to existing with no connection detail, or where drawing requirement is shown one place but not another.
 - b. Conflicting contract requirements where system intent is clear and buildable.
 - c. Temporary supports needed either to shore up existing conditions, or for new work as it is built into, around, over, under, though, or otherwise in conflict with existing conditions.
 - d. New utility routings interfering with existing site conditions not detailed on plans, resulting in minor offsets and work arounds for new work as it is built into, around, over, under, though, or otherwise in conflict with existing conditions.
 - e. Winter conditions, unless contractor proves by independent weather analysis submittal that statistically significant (beyond two standard deviations worse than average based on entire weather data history) adverse weather conditions have occurred.
4. Work shall proceed without delay unless it is impossible to build using means and methods typical in type of construction defined.

Disagreement with COR's determination of RFIs answered
"Clarifications only - no modification" shall not delay work, in
keeping with FAR 52.211-10 Commencement, Prosecution, and Completion
of Work.

1.11 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.

1.12 WITHHOLDING OF PAYMENT

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

PART 2 - (NOT USED)

PART 3 - (NOT USED)

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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-2010Guidelines 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

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 can identify 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:
- No impact - Near miss incidents that should be investigated but are not required to be reported to the VA.
- 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.

Moderate incident/impact - These incidents must be investigated and are required to be reported to the VA. Any work-related injury or illness that results in:

1. Days away from work (any time lost after day of injury/illness onset), or
2. Restricted work, or
3. Transfer to another job, or
4. Medical treatment beyond first aid, or
5. Loss of consciousness, or
6. 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,
7. Any incident that leads to major equipment damage (greater than \$5000).

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 two hours after the incident.

- E. 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 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. 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 COR.

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 Contractor to be the "controlling authority" for all worksite safety and health of each subcontractor(s). Contractor shall be 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.
- B. The APP shall be prepared as follows:
1. Written in English by a qualified person who is employed by the 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.
 2. Address both the Contractor's and the subcontractor's work operations.
 3. State measures to be taken to control hazards associated with materials, services, or equipment provided by suppliers.
 4. Address all the elements/sub-elements and in order as follows:
 - a. **SIGNATURE SHEET**. Title, signature, and phone number of the following:
 - 1) Plan preparer (Qualified Person such as corporate safety staff person or contracted Certified Safety Professional with construction safety experience),
 - 2) Plan approver (company/corporate officers authorized to obligate the company), and
 - 3) 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).

b. **BACKGROUND INFORMATION.** List the following:

- 1) Contractor,
- 2) Contract number,
- 3) Project name, and
- 4) Brief project description, description of work to be performed, and location; phases of work anticipated (these will require an AHA).

c. **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.

d. **RESPONSIBILITIES & LINES OF AUTHORITIES.** Provide the following:

- 1) A statement of the employer's ultimate responsibility for the implementation of his SOH program.
- 2) 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.
- 3) 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.
- 4) A statement that no work shall be performed unless a designated competent person is present on the job site.
- 5) Requirements for pre-task Activity Hazard Analysis (AHAs).
- 6) Lines of authority.
- 7) Policies and procedures regarding noncompliance with safety requirements (to include disciplinary actions for violation of safety requirements) should be identified.

e. **SUBCONTRACTORS AND SUPPLIERS.** Provide procedures for coordinating SOH activities with other employers on the job site.

- 1) Identification of subcontractors and suppliers (if known).
- 2) Safety responsibilities of subcontractors and suppliers.

f. TRAINING

- 1) 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.
- 2) Mandatory training and certifications that are applicable to this project (including crane operator, rigger, crane signal person, fall protection, electrical lockout/NFPA 70E, machine/equipment lockout, or confined space) and any requirements for periodic retraining/recertification are required.
- 3) Procedures for ongoing safety and health training for supervisors and employees shall be established to address changes in site hazards/conditions.
- 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), SSHA, CSP/CSHT and Superintendent. OSHA 30 certificates must be dated within the last five (5) years, or they will be considered VOID.

g. SAFETY AND HEALTH INSPECTIONS

- 1) 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.
- 2) Any external inspections/certifications that may be required (e.g., contracted CSP or CSHT).

h. 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 COR:

- 1) Exposure data (man-hours worked).
- 2) Accident investigation reports.
- 3) Project site injury and illness logs.

i. 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 limited to the following:

- 1) Emergency response
- 2) Contingency for severe weather
- 3) Fire Prevention
- 4) Medical Support
- 5) Posting of emergency telephone numbers
- 6) Prevention of alcohol and drug abuse
- 7) Site sanitation (housekeeping, drinking water, toilets)
- 8) Night operations and lighting
- 9) Hazard communication program
- 10) Welding/Cutting "Hot" work
- 11) Electrical Safe Work Practices (Electrical LOTO/NFPA 70E)
- 12) General Electrical Safety
- 13) Hazardous energy control (Machine LOTO)
- 14) Site-Specific Fall Protection & Prevention
- 15) Excavation/trenching (Excavation Permit included as appendix)
and Include Excavation Permit as appendix to this spec.
- 16) Asbestos abatement
- 17) Lead abatement
- 18) Crane Critical lift
- 19) Respiratory protection
- 20) Health hazard control program
- 21) Radiation Safety Program
- 22) Abrasive blasting
- 23) Heat/Cold Stress Monitoring
- 24) Crystalline Silica Monitoring (Assessment)
- 25) Demolition plan (to include engineering survey)
- 26) Formwork and shoring erection and removal
- 27) Precast Concrete
- 28) Public (Mandatory compliance with ANSI/ASSE A10.34-2012)
- 29) Fall Protection Plan (must include a rescue plan and be
concurrent with OSHA's present fall prevention recommendations).
- 30) Silica Plan.

- C. **Submit the APP in accordance with Section 01 33 23 SUBMITTALS within 60 calendar days of the Notice to Proceed meeting.** Mobilization cannot proceed without an accepted APP.
- D. Once accepted by the COR, 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.
- E. Once work begins, changes to the accepted APP shall be made with the knowledge and concurrence of the COR, facility construction Safety Officer, project superintendent, and SSHO. 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 (sample 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 COR and discussed with all engaged in the activity, including the Contractor, subcontractor(s), and facility construction Safety Officer 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(s) of their competency/qualification shall be submitted to the COR 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 in accordance with Section 01 33 23 SUBMITTALS with the Accident Prevention Plan (APP); or at least 15 calendar days prior to the start of that specific activity.** 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 during the preconstruction planning of each phase of this project at the Contractor supervisory safety meeting and updated as necessary when procedures, scheduling, or hazards change.
 5. Develop the AHAs 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 Contractor for review and approval and then submitted to the COR.

1.6 NTP AND CONSTRUCTION KICKOFF MEETING:

- A. Notice to Proceed (NTP) will start the contractor's "clock" for preconstruction submittals. The NTP is separate from and mutually exclusive of the Construction Kickoff Meeting. The NTP date starts the preconstruction submittal timeline.

- B. The Construction Kickoff Meeting will be coordinated by the COR and will include the Contractor, VA shops, Safety, Infection Control Nurse, representatives of the departments behind the exterior walls affected by this project and subcontractors as determined by the Contractor. This meeting will be held 30-60 days after the NTP meeting, dependent upon preconstruction submittal approvals, specifically the construction schedule and the planned mobilization date.
- C. 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 Construction Kickoff Meeting to gain a mutual understanding of its implementation. This includes the project superintendent, subcontractor superintendents, and any other assigned safety and health professionals.
- D. 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 COR as to which phases will require an AHA. In addition, establish a schedule for the preparation, submittal, review, and acceptance of AHAs to preclude project delays.
- E. Deficiencies in the submitted APP will be brought to the attention of the Contractor within 14 calendar 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 PROJECT MANAGER, SUPERINTENDENT, SITE SAFETY AND HEALTH OFFICER (SSHO), COMPETENT PERSONS (CP), QUALITY CONTROL MANAGER (QCM), AND CONSTRUCTION HEALTH AND SAFETY TECHNICIAN(CHST)/CERTIFIED SAFETY PROFESSIONAL (CSP):

- A. The General Contractor shall designate a Project Manager for the contract. The Project Manager shall be an employee of the General Contractor. The Project Manager shall be OSHA 30 qualified.
- B. The General Contractor shall designate a full-time on site Superintendent for the contract. The Superintendent shall be an employee of the General Contractor. This individual shall exclusively superintend the work on the contract, including all subcontractors, vendors, and suppliers, and shall not superintend any other contracts,

including one on the VA Milwaukee campus during the approved construction schedule.

- a. The Superintendent and Project Manager shall not be the same individual.
 - b. The Superintendent shall be available to the COR or VA Safety Officer on the project site during work.
 - c. The Superintendent may not perform any duties for the sub-contractor as a designated competent person.
- C. The General Contractor shall designate a full-time Site Safety and Health Officer (SSHO) for the contract. The SSHO shall be an employee of the General Contractor. This individual shall administer the General Contractor's Safety Program and government-accepted Accident Prevention Plan (APP). **For this contract, the Superintendent and SSHO may be the same individual.**
- D. Each sub-contractor shall designate a minimum of one Competent Person (CP) in compliance with 29 CFR 1926.20 (b) (2) that will be identified as a CP to administer their individual safety programs. All specialized Competent Persons for the work crews will be supplied by the respective sub-contractors as required by 29 CFR 1926 (i.e., Asbestos, Plumbing, Electrical, Cranes & Derricks, Demolition, Fall Protection, Fire Safety/Life Safety, Ladder, Rigging, swing stages, and Scaffolds).
1. Competent Persons may have collateral duties as the sub-contractor's superintendent and/or work crew lead persons as well as fill more than one specialized CP role.
 2. The repeated presence of uncontrolled hazards during a sub-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).
- E. The General Contractor shall designate a full-time Quality Control Manager (QCM) for the contract. The QCM shall be an employee of the General Contractor and shall be a different individual (not Superintendent/SSHO) as assigned by the General Contractor. The General Contractor's Project Manager may be the QCM.
- F. The General Contractor shall designate a Certified Health and Safety Technician (CHST) or Certified Safety Professional (CSP) for the contract. The CHST/CSP may be an employee of the General Contractor, or

the General Contractor may sub-contract for these services. Refer to 1.9 INSPECTIONS for CHST/CSP requirements and duties. The CHST/CSP shall not be the same individual as the Project Manager/QCM or Superintendent/SSHO.

- G. The Superintendent/SSHO shall 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 the above-mentioned clause. A listing of the designated Project Manager, Superintendent, SSHO, QCM, CHST/CSP 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.
- H. Any deviation from portions of Section 1.7 must be approved by the VA Projects Supervisor or Chief Engineer in writing.
- I. 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 General Contractor Superintendent/SSHO shall 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 individual shall 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 five (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, swing stages, and scaffolds 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 in accordance with Section 01 33 23 SUBMITTALS within 60 calendar days of the Notice to Proceed meeting. Training documentation may be part of the Contractor's APP.**
- F. Prior to any worker for the contractor or subcontractors beginning work, they shall undergo a safety briefing provided by the Superintendent/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 and accident reporting. Documentation shall be provided to the COR that individuals have undergone contractor's safety briefing.
- G. Ongoing safety training will be accomplished in the form of weekly documented safety meeting (i.e., "Toolbox Talks".)

1.9 INSPECTIONS:

- A. The Superintendent/SSHO shall conduct DAILY safety inspections of the site and each of the subcontractors CPs shall conduct DAILY safety inspections of their work operations as required by 29 CFR 1926.20(b)(2). Each week, the Superintendent/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 the COR.
- 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 may 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 monthly inspections shall be documented with tracking of the identified hazards to abatement.
2. The COR shall be notified immediately prior to start of the inspection and invited to accompany the inspection.
3. Identified hazard and controls shall 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 shall be provided to the COR within one week of the onsite inspection.

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

- A. The 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 COR as soon as practical, but no more than four hours after any accident meeting the definition of a Moderate or Major incident, High Visibility incident, or any weight handling and hoisting equipment accident. With the COR 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, and weather). Preserve the conditions and evidence on the accident site until the COR determines 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 COR within five (5) calendar days of the accident. The COR 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 COR 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 COR monthly. The Contractor's and associated subcontractor's OSHA 300 logs will be made available to the COR when 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
2. Safety glasses (meeting ANSI Z.87.7 standard
3. Safety Shoes (meeting ASTM F2413-11 standard
4. Hearing protection - Use in designated noise hazardous areas or when performing noise hazardous tasks.
5. Facemasks meeting VA and OSHA standards shall be worn at all times in hospital buildings.

1.12 INFECTION CONTROL

- A. Infection Control is critical to the VA Milwaukee Medical Center. Interior construction activities causing disturbance of existing dust, or creating new dust, shall be conducted within ventilation-controlled areas that minimize the flow of airborne particles into patient areas.
- B. A Preconstruction Risk Assessment (PCRA) will be completed by the Government prior to construction solicitation, award and the Construction Kickoff Meeting. The PCRA is an analysis associated with general construction activities, focused primarily on Infection Control, and is in accordance with FGI Guidelines. The PCRA will determine the Infection Control Risk Assessment (ICRA) permit requirements as well as Intermediate Life Safety Measures (ILSM) requirements. The ICRA procedure is found on the American Society for Healthcare Engineering (ASHE) website. ICRA risk classifications of Class II or lower will require approval by the COR before beginning any construction work. ICRA risk classifications of Class III or higher will require an ICRA permit. Infection Control permits will be issued by the Infection Control Nurse via the COR. ICRA permits will be posted

outside the appropriate construction area - on the construction door.

Note: more than one permit may be issued for a construction project.

- C. All work associated with this project has been classified as Construction Class IV with regards to Infection Control precautions. These precautions are built into the Contract Documents (drawings and specifications) as well as the Contractor's minimum infection control and construction safety requirements. These are established by the PCRA and IC Nurse reviews and as verified and confirmed with the Contractor's Infection Control plans.
- D. 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 ceiling tiles displaced for visual inspection.
 - b. Upon Completion:
 - 1) Clean work area upon completion of task.
 - 2) Notify the COR.
 2. Class II requirements:
 - a. During Construction Work:
 - 1) Notify the COR.
 - 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 COR.
3. Class III requirements:
- a. During Construction Work:
 - 1) Obtain permit from the COR.
 - 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, -0.02 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) Contain construction waste before transport in tightly covered containers.
 - 6) Cover transport receptacles or carts. Tape covering unless solid lid. Avoid taking receptacles back into the hospital interior.
 - b. Upon Completion:
 - 1) Do not remove barriers from work area until completed project is inspected by the COR and thoroughly (terminally) cleaned by VA Environmental Management Services (EMS).
 - 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 COR.

4. Class IV requirements:

a. During Construction Work:

- 1) Obtain permit from the COR
- 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, **-0.02 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) Seal holes, pipes, conduits, and punctures.
- 5) Contain construction waste before transport in tightly covered containers.
- 6) Cover transport receptacles or carts. Tape covering unless solid lid. Avoid taking receptacles back into the hospital interior.
- 7) Construct anteroom and require all construction personnel to pass through this room, when accessing the roof work areas from the interior of the hospital. Provide HEPA vacuum cleaner in anteroom so that Contractor can be cleaned before leaving work site. Alternately, Contractor may wear cloth or paper coveralls that are removed each time they leave work site.

b. Upon Completion:

- 1) Do not remove barriers from work area until completed project is inspected by the COR and thoroughly (terminally) cleaned by VA Environmental Management Services (EMS).
- 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 COR.

E. Barriers shall be erected as required based upon classification (Class III & IV requires barriers) and shall be constructed as follows:

1. For projects that can be contained in a single room, a closed door with VA-accepted tape over the frame and door is acceptable to meet Infection Control requirements. The GC shall keep in mind possibility of dust migrating into the interior spaces from exterior work of removing brick and cutting precast panels.
2. Construction, demolition, or reconstruction not capable of containment within a single room must have the one of the following barriers erected and made presentable on hospital-occupied (public) side:
 - a. For LIMITED DURATION construction, and when dust control is the only hazard, and an agreement can be made during the Construction Kickoff meeting (between COR, Infection Control Nurse, Construction Safety Officer and Contractor) stating that an airtight plastic barrier (or similar) that extends from the floor to ceiling shall be adequate for Class III/IV infection control. Seams must be sealed with VA-approved tape to prevent dust and debris from escaping.
 - b. A steel stud, drywall and insulated construction and infection control barrier erected with tapped/mudded joints to prevent dust and debris from escaping. If this barrier is to function as Construction Barrier as well as Infection Control Barrier, then it must be deck-to-deck, and Contractor shall be responsible for any temporary relocations of infrastructure above ceiling.
 - c. Seal all penetrations in existing construction barrier airtight. Any existing walls, floors or ceilings that are part of the construction barrier shall maintain the 1-hour fire rating at a minimum (meaning fire-caulk is required when sealing any penetrations).
 - d. IC/CN Barriers at penetration of ceiling envelopes, chases, and ceiling spaces to stop movement air and debris.

- e. At elevators shafts or stairways within the field of construction, overlapping flap minimum of two feet wide of polyethylene enclosures for personnel access.
 - f. Note that for Class IV construction only, an anteroom shall be constructed that allows Contractor to remove protective clothing or vacuum off existing clothing.
- F. Products and Materials:
- 1. Sheet Plastic: Fire retardant polystyrene, 6-mil thickness meeting local fire codes.
 - 2. Barrier Doors: Self-closing, latching 1-hour fire-rated hollow metal door in steel frame, painted yellow. Contractor shall provide latch/lockset (SFIC-ready) and card reader tied into Physical Access Control System. VA will provide construction SFIC.
 - 3. Dust proof 1-hour fire-rated Type X 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. Place in front of each Roof Access points.
 - 7. Disinfectant: Hospital-approved disinfectant or equivalent product.
 - 8. Portable Ceiling Access Module.
- G. 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.
- H. A dust-control program shall be established and maintained as part of the Contractor's Infection Control preventive measures (workplan) in accordance with the FGI Guidelines for Design and Construction of Healthcare Facilities. Prior to start of work, and in accordance with the Contract Documents, prepare an **Infection Control Plan** for the preliminary phases detailing project-specific dust protection measures

with associated product data, including periodic status reports, and submit in accordance with Section 01 33 23 SUBMITTALS within 30 calendar days of the Notice to Proceed meeting. Note that there will be Infection Control Plans submitted at various times throughout construction as the Contractor moves between phases or from one building/floor to the next.

- I. 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, through roof top intakes.
 3. Adhesive walk-off mats shall be used at all interior transitions from the construction area to the Medical Center. These mats shall be changed as often as required to maintain clean work areas directly outside construction area.
 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 COR. 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. Refer to Specification 01 74 19 for more information regarding construction waste management.
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. HEPA 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 and flooring.
- 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. 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 - (NOT USED)

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 in accordance with Section 01 33 23 SUBMITTALS within 30 calendar days of the Notice to Proceed meeting.** This plan may be an element of the Accident Prevention Plan. Each major phase of the project may have its own Fire Safety Plan. Coordinate with the COR.

- 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 20 feet exposing overall length, separate by 10 feet.
- D. Temporary Construction Partitions:
 - 1. Install and/or maintain temporary construction partitions to provide 1-hour fire-rated and smoke-tight separations between construction areas and adjoining hospital-occupied (public) areas. Construct partitions of fire-rated gypsum board (flame spread rating of 25 or less in accordance with ASTM E84) on both sides of fire-retardant treated metal steel studs. Extend the partitions through suspended ceilings to floor slab deck above. Seal joints and penetrations with VA-approved firestopping sealant. At door openings, install Class C, 3/4-hour fire-rated doors/frames with self-closing devices.
 - 2. Install 1-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 fire-rated construction to maintain fire ratings. Seal penetrations with listed through-penetration firestop materials in accordance with Specification 07 84 00.
- 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 COR.
- G. Egress Routes for Construction Workers: Maintain free and unobstructed egress. Inspect daily. Report findings and corrective actions weekly to COR.
- 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. 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 14 days in advance. Designate Contractor's responsible project-site fire prevention program manager to permit hot work.
- K. Fire Hazard Prevention and Safety Inspections: Inspect entire construction areas weekly. Coordinate with, and report findings and corrective actions weekly to COR.
- L. Smoking: Smoking is prohibited throughout the entire VAMC Milwaukee campus. This is a smoke-free campus.
- M. Dispose of waste and debris in accordance with NFPA 241. Remove from buildings daily. Refer to Specification 01 74 19.
- N. 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).
 - 1. Development of a Hazardous Electrical Energy Control Procedure is required prior to de-energization to be submitted with associated Activity Hazard Analysis (AHA). 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 NOT 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. Verification of the absence of voltage after de-energization and lockout/tagout does not require an energized electrical work (live work) permit.
 3. Personal Protective Equipment (PPE) and electrical testing instruments will be readily available for inspection by the COR.
- 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 COR 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 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, 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. Additionally, submit PE stamped scaffolding design.
- B. The fall protection (FP) threshold height requirement is 6 ft 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 in height, positive fall protection shall be used.

1.18 EXCAVATION AND TRENCHES: (NOT USED)

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 no less than 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 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, or
 - b. 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, BRAZING 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 14 days in advance. Designate Contractor's responsible project-site fire prevention program manager to permit hot work.

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 three (3) ft above the upper landing surface.
 - 1. When a 3-ft 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 daily 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 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.

PART 2 - (NOT USED)

PART 3 - (NOT USED)

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Milwaukee VAMC
695-22-121 VAMKE Bldg 111 Façade Repair
Milwaukee, WI 53295

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March 16, 2026

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VHA Pre-Construction Risk Assessment (PCRA)

PCRA Introductory Information and Instructions

Use this template as a baseline for performing facility Pre-Construction Risk Assessments (PCRA) for Construction, Renovation, and Maintenance work (referred to as the “activity” in this document). The template provides minimum requirements for categorizing activity type(s) and safety risk to determine the level of precautions needed to prevent impact related to Construction, Renovation and Maintenance on patients, employees, and contractors.

Ensure that the activity statement of work and any drawings available are used for the PCRA assessment and included in the project file with the completed PCRA.

Communication and coordination of all types of activity with affected areas are to be included among the control measures. The development of communication and coordination plans must begin during the activity planning phase.

Facilities may customize this template to incorporate site-specific information and requirements.

NOTE: This VHA PCRA template pertains specifically to non-infection-related safety for Construction, Renovation, and Maintenance activities. It must be used in conjunction with the VHA Infection Control Risk Assessment (ICRA) for the activity, if required, which specifically addresses infection risks outside the scope of this PCRA.

PERMIT: See the last page of this document for a fillable permit form to be used for posting at the activity site.

Activity

Location:

**Activity Name, Number,
and/or Brief Description:**

Table 1 - Construction, Renovation, and/or Maintenance Activity Type and Control Measures

NOTE: If any of the bulleted criteria in a higher activity type pertains to the work that will be done (even if the other criteria are in a lower type), use the higher activity type for the VHA PCRA.

Controls defined in Table 1 for the activity must be in place before the activity begins and maintained until work is completed and the area is activated. Control measures for each activity must also include the control measures in the preceding row(s).

As the activity progresses, a full re-evaluation of remaining activity type and risk is required prior to changing the level of control measures.

Activity Type determined from Table 1:

VHA Pre-Construction Risk Assessment (PCRA)

Table 1: Every question must be answered with an “X” answering if part of project (yes or no).

If “Yes” is answered as part of project, the work is the type noted – inspect/upkeep, small scale or large scale. Always default to the highest category.

Activity Type and Description		Part of Project (Yes or No)		Actions Taken	Inspect/ Upkeep	Small Scale Const / Renov	Large Scale Const /Renov
		Yes	No				
1	Work can be completed in a single shift, <u>not to exceed 10 hours</u> . - Patients, employees and/or visitors may be in the area depending on the activity. - Work that does not create dust or debris. - Work that does not create vapors or fumes.	YES		Site visits of construction area are required weekly by member of multi-disciplinary team. Site visits will be documented on standard checklist.	X		
2	- Prolonged work that may take longer than a single shift but <u>not exceeding six months</u> . - Patients and employees are not to be in the area until activity is completed.	YES		Daily inspections of the site are to be conducted by the General Contractor or shop supervisor and documented on their daily log.		X	
3	- Work exceeding six months. - Patients and employees are not to be in the area until activity is completed.	YES		Daily inspections of the site are to be conducted by the General Contractor or shop supervisor and documented on their daily log.			X
4	Removal of ceiling tile or access to mechanical or electrical chase for visual inspection that will not impair fire safety systems and are limited to 1 tile per 50 square feet with limited exposure time (not to exceed an hour for each tile) within the shift.		NO	Immediately replace any ceiling tile, close access panels, etc., upon completion of work.	X		
5	Minor interior updates (e.g., replacing floor or ceiling tiles, carpentry work to include hanging signage, and painting with hand tools) that do not create vibration or noise.	YES		Immediately replace any ceiling tile, close access panels, etc., upon completion of work.	X		
6	Limited building system maintenance that does not require Lock Out Tag Out (LOTO) such as plumbing on potable systems limited to faucet replacement, steam trap replacement etc. and electrical work such as replacement of bulbs, receptacles, or switches.		NO	Site specific safety plan, task hazard analysis, and hazard communication required to be provided by the contractor and approved where a contact is in place. For internal work the shop involved must work with Safety to ensure proper precautions are in place	X		
7	Work will impact egress routes (corridors, stairwells, exit distances, etc.)	YES		An ILSM is required and staff training (VA Safety). Exit signage changes (contractor).		X	X
8	Work will impact traffic flow requiring alternate routes.	YES		Signage changes.		X	X
9	Security (site security, access control, etc.)	YES		Card readers for all construction areas, chain link fences around site, etc.		X	X

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Activity Type and Description		Part of Project (Yes or No)		Actions Taken	Inspect/ Upkeep	Small Scale Const / Renov	Large Scale Const / Renov
		Yes	No				
10	Work that creates some noise and vibration due to power tool use.	YES		Excessive noise and vibration producing work is scheduled off normal working hours, weekends, Federal Holidays.		X	X
11	VA phone available at work site (for emergency use)		NO	Install jobsite phone (contractor to run wire). VA IT will install phone.		X	X
12	Selective demolition/removal of preexisting floor covering, casework, lay-in ceiling, or other architectural elements that may - create the potential for falling objects	YES		Ensure area under and around work area is cordoned off.		X	X
13	Selective demolition/removal of preexisting floor covering, casework, lay-in ceiling, or other architectural elements that may - create vibration and/or noise in excess of 80 dB(A) in surrounding areas.	YES		Excessive noise and vibration producing work is scheduled off normal working hours, weekends, Federal Holidays.		X	X
14	Selective demolition/removal of preexisting floor covering, casework, lay-in ceiling, or other architectural elements that may - cause penetrations in fire or smoke barrier	YES		Infection Control Plan in place, ICRA Permit in place.		X	X
15	Selective demolition/removal of preexisting floor covering, casework, lay-in ceiling, or other architectural elements that may - disturb asbestos	YES		ACM abatement plan and monitoring per specification. Infection control barriers and negative air HEPA units are installed (dust control plan). ICRA Permit in place.		X	X
16	Selective demolition/removal of preexisting floor covering, casework, lay-in ceiling, or other architectural elements that may - disturb lead	YES		Lead abatement plan and monitoring per specification. Infection control barriers and negative air HEPA units are installed (dust control plan). ICRA Permit in place.		X	X
17	Selective demolition/removal of preexisting floor covering, casework, lay-in ceiling, or other architectural elements that may - disturb Silica	YES		Silica removal plan and monitoring per specification. Infection control barriers and negative air HEPA units are installed (dust control plan). ICRA Permit in place.		X	X

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Activity Type and Description		Part of Project (Yes or No)		Actions Taken	Inspect/ Upkeep	Small Scale Const / Renov	Large Scale Const / Renov
		Yes	No				
18	Plumbing work such as the installation of new sinks, showers and toilets and associated plumbing that requires utility outages or work on the steam system that may require: - LOTO - The use of compressed gas cylinders		NO	Coordinate outages 3 weeks in advance, provide temporary utilities as required, LOTO procedures in place and staff trained on their use. After piping/work is complete, run water lines affected for 10 minutes and complete flushing logs.		X	
19	Plumbing work requiring LOTO and system shutdown and startup such as the installation of: - new medical gas systems, - steam/heating hot water, condensate systems, - Potable water and sanitary drainage, multiple sinks, showers and toilets including associated plumbing.		NO	Coordinate outages 3 weeks in advance, provide temporary utilities as required, LOTO procedures in place and staff trained on their use. Recertification procedures for medical gas systems. After piping/work is complete, run water lines affected for 10 minutes and complete flushing logs.			X
20	Electrical work such as installation of conduit and wire for lighting, receptacles and switches for an area, the installation of conduit and wire for new devices such as terminal units, fans etc. Electrical work such as installation of cabling/wiring/conduit for a single device, installation of new device such as a light fixture that require LOTO.		NO	coordinate outages 3 weeks in advance, provide temporary utilities as required, LOTO procedures in place and staff trained on their use.		X	
21	Electrical work such as installation of electrical feeders, distribution panels, conduit and wire for lighting, receptacles and switches for an area, the installation of conduit and wire for new devices such as terminal units, fans etc. requiring LOTO and system isolation.		NO	Coordinate outages 3 weeks in advance, provide temporary utilities as required, LOTO procedures in place and staff trained on their use.			X
22	Air Handler and/or fan shutdown/startup and HVAC work such as replacement of a single diffuser, single terminal unit, a single device and the installation of ductwork, diffusers, and terminal units for an area that may require: - Work on ladders - Rigging, hoisting or lifting of equipment or materials overhead		NO	coordinate outages 3 weeks in advance, provide temporary utilities as required, LOTO procedures in place and staff trained on their use.		X	
23	Mechanical work such as the installation of air handling equipment, associated ductwork, diffusers, heat exchangers, terminal units and controls requiring lifting and support of equipment and systems.		NO	coordinate outages 3 weeks in advance, provide temporary utilities as required, LOTO procedures in place and staff trained on their use.			X

VHA Pre-Construction Risk Assessment (PCRA)

Activity Type and Description		Part of Project (Yes or No)		Actions Taken	Inspect/ Upkeep	Small Scale Const / Renov	Large Scale Const /Renov
		Yes	No				
24	Fire Alarm System - Modification of existing fire alarm and suppression systems requiring system outages and ILSMs or obstruction of exits and or impact on corridors.		NO	coordinate outages 3 weeks in advance, provide temporary utilities as required, LOTO procedures in place and staff trained on their use.		X	
25	Fire Alarm System - Installation of fire alarm and suppression systems requiring outages of those systems and ILSMs or closure of exits/corridors		NO	coordinate outages 3 weeks in advance, provide temporary utilities as required, LOTO procedures in place and staff trained on their use.			X
26	Architectural, structural, or any other work that may cause vapors or fumes such as: - Roofing work - Flooring work - Painting or other large-scale use of such substances.	YES				X	
27	The installation building components such as new walls, ceilings and doors including framing, drywall and associated plaster work that requires transport of significant materials through building and up elevators i.e., weight limits of floors and elevators.	YES		Use of B-Bank Elevators not exceeding weight limit.		X	X
28	Excavation or heavy equipment use taking place - Dig safe required utility location - Trench safety - Dust control plan - Equipment exhaust, Noise, Vibration		NO	Excavation safety plan to be provided by contractor and approved by VA. Dig safe paperwork in place.			X
29	Confined space entry required (permit required or not)		NO	Confined entry plan in place and staff trained			X
30	Requires crane work - General crane work - Lift over buildings	YES		Crane lift plan in place - Crane placement - Crane swing - Crane load evaluation			X
31	Includes elevated work - Roof work, fall protection - Window work, scaffolding and fall protection - Odor control	YES		Fall protection plan in place and staff trained. Comply with OSHA and VA standards.			X
32	Welding, cutting or use of torches requiring burn	YES		Hot Work or burn permits in place and staff trained			X
33	Data / Telephone / Wireless (Staff or Guest WiFi) - are there modifications of installation of new systems that will impact operaitons.		NO	Coordinate outages 3 weeks in advance, provide temporary utilities as required, LOTO procedures in place and staff trained on their use.		X	X
34	Natural Gas Service - are there modifications to the existing system, interruptions to service or installation of new?		NO	Coordinate outages 3 weeks in advance, provide temporary utilities as required, LOTO procedures in place and staff trained on their use.		X	

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Activity Type and Description		Part of Project (Yes or No)		Actions Taken	Inspect/ Upkeep	Small Scale Const / Renov	Large Scale Const /Renov
		Yes	No				
35	Pneumatic Tube System - are there modifications to the existing system, interruptions to service or installation of new?		NO	Coordinate outages 3 weeks in advance, provide temporary utilities as required, general broadcast.		X	
36	Are there moves to patients or staff involved? Coord with Arch Shop, Move Team & Planner. How will this affect start of project? How are patient services impacts being handled?	YES		Coordination and phasing identified in construction documents.		X	X

Activity Type and Description	Control Measures
Inspection/upkeep generally defined as follows: • Work can be completed in a single shift, not to exceed 10 hours. • Patients, employees and/or visitors may be in the area depending on the activity. • Work that does not create dust or debris. • Work that does not create vapors or fumes. • Removal of ceiling tile or access to mechanical or electrical chase for visual inspection that will not impair fire safety systems and are limited to 1 tile per 50 square feet with limited exposure time (not to exceed an hour for each tile) within the shift. • Minor interior updates (e.g., replacing floor or ceiling tiles, carpentry work to include hanging signage, and painting with hand tools) that do not create vibration or noise. • Limited building system maintenance that does not require Lock Out Tag Out (LOTO) such as plumbing on potable systems limited to faucet replacement, steam trap replacement etc. and electrical work such as replacement of bulbs, receptacles, or switches.	1. Immediately replace any ceiling tile, close access panels, etc., upon completion of work. 2. Site visits of construction area are required weekly by member of multi-disciplinary team. Site visits will be documented on standard checklist. 3. Site specific safety plan, task hazard analysis, and hazard communication required to be provided by the contractor and approved where a contact is in place. For internal work the shop involved must work with Safety to ensure proper precautions are in place. 4. Must address identified hazards and controls that will be implemented to ensure minimal impact to patients, employees, contractors and facility. 5. Communication and coordination plan for all affected areas
Small scale Construction, Renovation and general maintenance/repair work, generally defined as follows: • Prolonged work that may take longer than a single shift but not exceeding six months. • Patients and employees are not to be in the area until activity is completed. • Work that creates some noise and vibration due to power tool use. • Selective demolition/removal of preexisting floor covering, casework, lay-in ceiling, or other architectural elements that may ○ disturb asbestos, lead or silica ○ create the potential for falling objects ○ create vibration and/or noise in excess of 80 dB(A) in surrounding areas. ○ cause penetrations in fire or smoke barrier • Plumbing work such as the installation of new sinks, showers and toilets and associated plumbing that requires utility outages or work on the steam system that may require: ○ LOTO	All control measures in the row above and the following: 1. Hazard communication chemical inventory required to be provided by the contractor and approved. 2. Where construction, Renovation and maintenance are done in an accredited facility, and ILSM assessment is required to be done and ILSMs put into place in accordance with TJC LS.01.02.01 and the local facility policy including Fire watch if necessary. Staff is trained and the ILSM is verified regularly 3. Hot Work or burn permits in place and staff trained 4. LOTO procedures in place and staff trained on their use 5. Site visits will be reviewed using the criteria in standardized guide.

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○ The use of compressed gas cylinders • Electrical work such as installation of conduit and wire for lighting, receptacles and switches for an area, the installation of conduit and wire for new devices such as terminal units, fans etc. Electrical work such as installation of cabling/wiring/conduit for a single device, installation of new device such as a light fixture that require LOTO. • Air Handler and/or fan shutdown/startup and HVAC work such as replacement of a single diffuser, single terminal unit, a single device and the installation of ductwork, diffusers, and terminal units for an area that may require: ○ Work on ladders ○ Rigging, hoisting or lifting of equipment or materials overhead • Modification of existing fire alarm and suppression systems requiring system outages and ILSMs or obstruction of exits and or impact on corridors. • Architectural, structural, or any other work that may cause vapors or fumes such as: ○ Roofing work ○ Flooring work ○ Painting or other large-scale use of such substances.	6. Daily inspections of the site are to be conducted by the General Contractor or shop supervisor and documented on their daily log.
<u>Large-scale construction, renovation, or maintenance generally defined as follows:</u> • Work exceeding 6 months in duration. • Patients and employees are not to be in the area until activity is completed. • Excavation or heavy equipment use taking place ○ Dig safe required utility location ○ Trench safety ○ Dust control plan ○ Equipment exhaust, Noise, Vibration • Confined space entry required (permit required or not) • Requires crane work ○ General crane work ○ Lift over buildings • Includes elevated work ○ Roof work, fall protection ○ Window work, scaffolding and fall protection ○ Odor control • Welding, cutting or use of torches requiring burn permits • Demolition of building components and infrastructure including removal of multiple doors, walls, framing, ceilings, flooring, piping, electrical and HVAC that may ○ require asbestos, lead or silica abatement ○ create the potential for falling objects ○ create vibration and/or noise in excess of 90 dB(A) in surrounding areas. ○ cause breaches to fire or smoke barrier • The installation building components such as new walls, ceilings and doors including framing, drywall and associated plaster work that requires transport of significant materials through building and up elevators i.e., weight limits of floors and elevators • Plumbing work requiring LOTO and system shutdown and startup such as the installation of:	<u>All control measures in the two rows above and the following Activity Hazard Analyses and Control Plans (check all that apply):</u> 1. Excavation safety plan in place ☐ 2. Dust control plan in place ☐ 3. Pollution prevention plan in place ☐ 4. Dig safe paper work in place ☐ 5. Crane lift plan in place ☐ a. Crane placement b. Crane swing c. Crane load evaluation 6. Fall protection plan in place and staff trained ☐ 7. Confined entry plan in place and staff trained ☐

VHA Pre-Construction Risk Assessment (PCRA)

○ new medical gas systems, ○ steam/heating hot water, condensate systems, ○ Potable water and sanitary drainage, multiple sinks, showers and toilets including associated plumbing. ● Electrical work such as installation of electrical feeders, distribution panels, conduit and wire for lighting, receptacles and switches for an area, the installation of conduit and wire for new devices such as terminal units, fans etc. requiring LOTO and system isolation. ● Installation of fire alarm and suppression systems requiring outages of those systems and ILSMs or closure of exits/corridors ● Mechanical work such as the installation of air handling equipment, associated ductwork, diffusers, heat exchangers, terminal units and controls requiring lifting and support of equipment and systems.	
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Table 2. Affected Adjacent Area Assessment

In addition to the minimum precautions noted above for the Activity Type, it is critical that the activity be coordinated with the areas adjacent to the activity to ensure operations in those areas are not disrupted or impacted. List the adjacent areas in Table 2 below and develop activity-specific coordination plans and associated communication plans with each area to address activity work that could impact or disrupt the operation of the areas, in general as follows:

- If adjacent area is **vacant** (e.g., work outside, construction of new building, etc.):
 - Coordination is typically not necessary other than potentially traffic flow and pedestrian access.
- If adjacent area is **non-continuously occupied** (e.g., areas where outpatient care is provided, employee health, etc.):
 - Develop a list of activities that will potentially impact or disrupt the operation of the area (e.g., work involving noise, vibration or exit obstruction) and meet with POC to coordinate execution of work in a way that mitigates the impact (e.g., conduct work after hours).
- If adjacent area is **occupied continuously** (e.g., areas where inpatient care is provided, residential areas such as Community Living Centers, etc.):
 - Develop a list of activities that will potentially impact or disrupt the operation of the area (e.g., work involving noise, vibration or exit obstruction) and meet with POC to coordinate execution of work in a way that mitigates the impact (e.g., move affected party temporarily).

VHA Pre-Construction Risk Assessment (PCRA)

Area	Service(s)/Type(s) of Area(s) (e.g., OR, Unit/Ward, Sterile Processing, Administrative, etc)*	Point of Contact (POC)	POC Contact Information	Construction plan communicated to POC?
Activity Area**				
Area Above				
Area Below				
Adjacent Area 1				
Adjacent Area 2				
Adjacent Area 3				
Adjacent Area 4				

* There may be more than one Service/type of area for each row. List all. The information entered on this table must be used in the ICRA if required.

** List the area(s) in which the construction/renovation/maintenance activity will occur.

Infection Control Risk Assessment (ICRA)

Consult with Infection Prevention and Control regarding the assessment of potential infection risks associated with the activity and the need for control measures. See VHA Directive 7715 and the VHA ICRA Template for more information.

Is an ICRA required for the Activity? Yes ☒ No ☐

Pre-Construction Risk Assessment (PCRA) Permit

This page must be posted at the entrance to the project area, or other designated area

Unique permit number:			
Location and brief description of construction/renovation/maintenance			
Project manager		Project start date	
Contact phone number		Completion date	
Contractor or lead shop		Permit expiration date	

Activity Type <i>Inspection/Upkeep, Small-scale, or Large-scale</i>	
--	--

Activity Type	Control measures to be in place for the duration of the activity (Check the box for the Activity Type to indicate the Control Measures)
Inspection/Upkeep ☐	1. Immediately replace any ceiling tile, close access panels, etc., upon completion of work. 2. Site visits of construction area are required weekly by member of multi-disciplinary team. Site visits will be documented on standard checklist. 3. Site specific safety plan, task hazard analysis, and hazard communication required to be provided by the contractor and approved. 4. Must address identified hazards and controls that will be implemented to ensure minimal impact patients, employees, contractors and facility. 5. Communication and coordination plan for all affected areas
Small-scale ☐	All control measures in the row above and the following: 1. Hazard communication chemical inventory required to be provided by the contractor and approved. 2. ILSMs in place and staff trained on situation 3. Hot Work or burn permits in place and staff trained 4. LOTO procedures in place and staff trained on their use 5. Site visits will be reviewed using the criteria in standardized guide. 6. Daily inspections of the site are to be conducted by the General Contractor and documented on their daily log.
Large-scale ☐	All control measures in both rows above and the following Activity Hazard Analyses and Control Plans as applicable (check all that apply): 1. Excavation safety plan in place ☐ 2. Dust control plan in place ☐ 3. Asbestos abatement plan in place ☐ 4. Lead abatement plan in place ☐ 5. Silica removal plan in place ☐ 6. Pollution prevention plan in place ☐ 7. Dig safe paperwork in place ☐ 8. Crane lift plan in place ☐ a. Crane placement b. Crane swing c. Crane load evaluation 9. Fall protection plan in place and staff trained ☐ 10. Confined entry plan in place and staff trained ☐

Additional requirements:			
Is an Infection Control Risk Assessment (ICRA) required for the Activity? Yes ☐ No ☐			
Infection Prevention and Control signature:			
Date:			
Project Manager signature		Date	
Safety Officer signature		Date	
Chair, Construction Safety Committee signature		Date	

*The location of all Activity Hazard Analyses and Control Plans (excavation, dust, pollution, etc.) as applicable shall be identified on this permit and shall be made available to all workers on the job.

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:
- B. 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)**

The specifications cited in this solicitation may be obtained from the associations or organizations listed below.

AA	Aluminum Association Inc. http://www.aluminum.org
AABC	Associated Air Balance Council https://www.aabc.com
AAMA	American Architectural Manufacturer's Association http://www.aamanet.org
AASHTO	American Association of State Highway and Transportation Officials http://www.aashto.org
AATCC	American Association of Textile Chemists and Colorists http://www.aatcc.org
ACGIH	American Conference of Governmental Industrial Hygienists http://www.acgih.org
ACI	American Concrete Institute http://www.aci-int.net
ACPA	American Concrete Pipe Association http://www.concrete-pipe.org
ACPPA	American Concrete Pressure Pipe Association http://www.acppa.org
ADC	Air Diffusion Council http://flexibleduct.org
AGA	American Gas Association http://www.aga.org
AGC	Associated General Contractors of America http://www.agc.org
AGMA	American Gear Manufacturers Association, Inc. http://www.agma.org
AH	American Hort https://www.americanhort.org
AHAM	Association of Home Appliance Manufacturers http://www.aham.org
AIA	American Institute of Architects

	http://www.aia.org
AISC	American Institute of Steel Construction http://www.aisc.org
AISI	American Iron and Steel Institute http://www.steel.org
AITC	American Institute of Timber Construction https://aitc-glulam.org
AMCA	Air Movement and Control Association, Inc. http://www.amca.org
ANSI	American National Standards Institute, Inc. http://www.ansi.org
APA	The Engineered Wood Association http://www.apawood.org
ARI	Air-Conditioning and Refrigeration Institute http://www.ari.org
ARPM	Association for Rubber Product Manufacturers https://arpm.com
ASABE	American Society of Agricultural and Biological Engineers https://www.asabe.org
ASCE	American Society of Civil Engineers http://www.asce.org
ASHRAE	American Society of Heating, Refrigerating, and Air-Conditioning Engineers http://www.ashrae.org
ASME	American Society of Mechanical Engineers http://www.asme.org
ASSE	American Society of Sanitary Engineering International http://www.asse-plumbing.org
ASTM	American Society for Testing and Materials International http://www.astm.org
AWI	Architectural Woodwork Institute https://www.awinet.org
AWS	American Welding Society https://www.aws.org
AWWA	American Water Works Association https://www.awwa.org

BHMA	Builders Hardware Manufacturers Association https://www.buildershardware.com
BIA	The Brick Industry Association http://www.gobrick.com
CAGI	Compressed Air and Gas Institute https://www.cagi.org
CGA	Compressed Gas Association, Inc. https://www.cganet.com
CI	The Chlorine Institute, Inc. https://www.chlorineinstitute.org
CISCA	Ceilings and Interior Systems Construction Association https://www.cisca.org
CISPI	Cast Iron Soil Pipe Institute https://www.cispi.org
CLFMI	Chain Link Fence Manufacturers Institute https://www.chainlinkinfo.org
CPA	Composite Panel Association https://www.compositepanel.org
CPMB	Concrete Plant Manufacturers Bureau https://www.cpmc.org
CRA	California Redwood Association http://www.calredwood.org
CRSI	Concrete Reinforcing Steel Institute https://www.crsi.org
CTI	Cooling Technology Institute https://www.cti.org
DHA	Decorative Hardwoods Association https://www.decorativehardwoods.org
DHI	Door and Hardware Institute https://www.dhi.org
EGSA	Electrical Generating Systems Association http://www.egsa.org
EEI	Edison Electric Institute https://www.eei.org
EPA	United States Environmental Protection Agency https://www.epa.gov

ETL	ETL Testing Services http://www.intertek.com
FAA	Federal Aviation Administration https://www.faa.gov
FCC	Federal Communications Commission https://www.fcc.gov
FPS	Forest Products Society http://www.forestprod.org
GANA	Glass Association of North America http://www.glasswebsite.com
FM	Factory Mutual Global Insurance https://www.fmglobal.com
GA	Gypsum Association https://gypsum.org
GSA	General Services Administration https://www.gsa.gov
HI	Hydraulic Institute http://www.pumps.org
ICC	International Code Council https://shop.iccsafe.org
ICEA	Insulated Cable Engineers Association https://www.icea.net
ICAC	Institute of Clean Air Companies http://www.icac.com
IEEE	Institute of Electrical and Electronics Engineers https://www.ieee.org/
IGMA	Insulating Glass Manufacturers Alliance https://www.igmaonline.org
IMSA	International Municipal Signal Association http://www.imsasafety.org
MBMA	Metal Building Manufacturers Association https://www.mbma.com
MSS	Manufacturers Standardization Society of the Valve and Fittings Industry http://msshq.org
NAAMM	National Association of Architectural Metal Manufacturers https://www.naamm.org

PHCC	Plumbing-Heating-Cooling Contractors Association https://www.phccweb.org
NBS	National Bureau of Standards See - NIST
NBBI	The National Board of Boiler and Pressure Vessel Inspectors https://www.nationalboard.org
NEC	National Electric Code See - NFPA National Fire Protection Association
NEMA	National Electrical Manufacturers Association https://www.nema.org
NFPA	National Fire Protection Association https://www.nfpa.org
NHLA	National Hardwood Lumber Association https://www.nhla.com
NIH	National Institute of Health https://www.nih.gov
NIST	National Institute of Standards and Technology https://www.nist.gov
NELMA	Northeastern Lumber Manufacturers Association, Inc. http://www.nelma.org
NPA	National Particleboard Association (See CPA, Composite Panel Association)
NSF	National Sanitation Foundation http://www.nsf.org
OSHA	Occupational Safety and Health Administration Department of Labor https://www.osha.gov
PCA	Portland Cement Association https://www.cement.org
PCI	Precast Prestressed Concrete Institute https://www.pci.org
PPI	Plastics Pipe Institute https://www.plasticpipe.org
PEI	Porcelain Enamel Institute http://www.porcelainenamel.com
PTI	Post-Tensioning Institute http://www.post-tensioning.org

RFCI	Resilient Floor Covering Institute https://www.rfci.com
RIS	Redwood Inspection Service (See Western Wood Products Association) https://www.wwpa.org
SCMA	Southern Cypress Manufacturers Association http://www.cypressinfo.org
SDI	Steel Door Institute http://www.steeldoor.org
SJI	Steel Joist Institute https://www.steeljoist.org
SMACNA	Sheet Metal & Air-Conditioning Contractors' National Association https://www.smacna.org
SSPC	The Society for Protective Coatings https://www.sspc.org
STI	Steel Tank Institute https://www.steeltank.com
SWI	Steel Window Institute https://www.steelwindows.com
TCNA	Tile Council of North America https://www.tcnatile.com
TEMA	Tubular Exchanger Manufacturers Association http://www.tema.org
TPI	Truss Plate Institute https://www.tpinst.org
UBC	The Uniform Building Code (See ICC)
UL	Underwriters' Laboratories Incorporated https://www.ul.com
ULC	Underwriters' Laboratories of Canada https://www.ulc.ca
WCLB	West Coast Lumber Inspection Bureau http://www.wclib.org
WDMA	Window and Door Manufacturers Association https://www.wdma.com

Milwaukee VAMC
695-22-121 VAMKE Bldg 111 Façade Repair
Milwaukee, WI 53295

11-01-20
100% Bid Documents
March 16, 2026

WRCLA Western Red Cedar Lumber Association
<https://www.realcedar.com>

WWPA Western Wood Products Association
<http://www.wwpa.org>

PART 2 (NOT USED)

PART 3 (NOT USED)

- - - E N D - - -

SECTION 01 45 00
QUALITY CONTROL

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section specifies requirements for Contractor Quality Control (CQC) .

1.2 APPLICABLE PUBLICATIONS

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.
- B. ASTM International (ASTM)
 - 1. 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 naming convention.
 - 1. Preconstruction Submittal - Submit the Quality Control Plan (CQC) as required below and in accordance with Section 01 33 23 SUBMITTALS.
 - 2. During construction (as required) - Test Reports / Verification Statements.

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 design and construction operations, both onsite and offsite, and be keyed to the proposed design and construction sequence. The Project Superintendent will be held responsible for the quality of work and is subject to removal by the Contracting 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. The General Contractor shall designate a specific Quality Control Manager and Project Manager (QCM/CPM), separate from the construction Superintendent and Safety Professional. The QCM/CPM may be the General Contractor's Project Manager as long as the applicable requirements are met for the CPM. The QCM/CPM shall 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 quality control is the project QCM/CPM. The project Superintendent maintains a physical presence at the site at all times and is responsible for all construction and related activities/production at the site, except as otherwise acceptable to the Contracting Officer. The Superintendent and the QCM/CPM shall work in concert.

3.2 CQC PLAN:

- A. **Submit the CQC Plan within 60 days of the Notice to Proceed.** An approved CQC is required in the preconstruction phase before mobilization will be allowed. Work outside of the accepted 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, offsite fabricators, vendors, 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 be issued by the CQC System Manager. Furnish copies of these letters to the Contracting Officer upon request.
 4. Procedures for scheduling, reviewing, certifying, and managing submittals including those of subcontractors, offsite fabricators, vendors, suppliers and purchasing agents. These procedures must be in accordance with Section 01 33 23 SUBMITTALS, RFIs and CBs.
 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 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 early in construction.
- 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 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 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 (Construction Kickoff Meeting) and before start of construction, and prior to acceptance by the Government of the CQC Plan, meet with the Contracting Officer to discuss the Contractor's quality control system. The CQC Plan shall be submitted and reviewed prior to this 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 understanding or address deficiencies in the CQC system or procedures which can require corrective action by the Contractor.

3.4 QUALITY CONTROL ORGANIZATION:

- A. The primary personnel requirements for the CQC organization include the Quality Control Manager (QCM), the Project Superintendent (PS), and the Safety and Health Officer (SSHO). Ancillary members include a sufficient number of additional qualified personnel to ensure safety and contract compliance. The SSHO shall satisfy the requirements of Specification 01 35 26 Safety Requirements and reports directly to a senior project (or corporate) official independent from the QCM. The SSHO will also serve as a member of the CQC Staff. Personnel identified in the technical provisions as requiring specialized skills to assure the required work is being performed properly will also be included as part of the CQC organization. The Contractor's CQC staff maintains a

presence at the site at all times during progress of the work and have complete authority and responsibility to take any action necessary to ensure Contract compliance. The CQC staff will be subject to acceptance by the Contracting Officer. Provide 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. The Contractor shall identify the Quality Control Manager (QCM) 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 QCM is required to be a graduate of a construction management course with a minimum of 10 years of construction QCM experience and at least five years' experience on projects similar in size, complexity, and scope. The QCM shall be employed by the General Contractor. Identify in the plan an alternate to serve in the event of the QCM's absence. The requirements for the alternate are the same as the QCM. If the General Contractor's Project Manager holds the required certifications/experience, he/she may be the QCM.
- C. Additionally, provide as part of the CQC organization specialized personnel to assist in the QCM for the following areas, as applicable: Rigging and operations of Swing Stages, Precast Flashing and sealing Pre-cast Concrete Panels and Masonry joints. These individuals shall be responsible to the QCM and may be designated by the GC from individual subcontractors. They shall be physically present at the construction site during work on the specialized personnel's areas of responsibility and shall have the necessary certifications, education or experience. These individuals can perform other duties but need to be allowed sufficient time to perform the specialized personnel assigned quality controls duties as described in the CQC Plan. 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. 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 COR for acceptance.

3.5 SUBMITTALS AND DELIVERABLES:

- A. Submittals shall comply with the requirements in Section 01 33 23 SUBMITTALS, RFIS AND CONSTRUCTION BULLETINS. The CQC organization is responsible for certifying that all submittals are in compliance with the contract requirements. RFIS AND CONSTRUCTION BULLETINS to ensure adequate time is allowed for each type of submittal required.

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 QCM 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. Examination of the work area to assure that all required preliminary work has been completed and is in compliance with the Contract.
 - f. 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.

- g. The Contractor shall determine "long lead time" material items specific to the contract and provide submittals for those items. Long lead time items are anything that will not be available for use in the Construction Phase at the time expected per the Contractor's Critical Path Schedule because of procurement delays outside the Contractor's influence. The potential exists for the contract to be suspended because of long lead time delays at the discretion of the Contracting Officer once these items are identified and submitted.
 - 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.
 - k. Check to ensure that the portion of the plan for the work to be performed has been accepted by the Contracting Officer.
 - l. Discussion of the initial control phase.
 - m. The Government shall be notified at least 48 hours or 2 business days in advance of beginning the Preparatory control phase. Include a meeting conducted by the QCM 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 QCM 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 QCM 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.
- 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.
- 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. Refer to 01 45 29 TESTING LABORATORY SERVICES specification.
- B. 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. 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, actual test reports are submitted later with a reference to the test number and date taken. Provide an information copy of tests performed by an offsite or commercial test facility directly to the Contracting Officer. Failure to submit timely test reports as stated results in nonpayment for related work performed and disapproval of the test facility for this Contract.

- C. 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 (GC's punch list): The Contractor's QCM shall conduct an inspection of the work near the end of the work, or any increment of the work established by the approved phasing plan. 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 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 (Government's Punchlist Inspection).
- B. Pre-Final Inspection (Government's Punchlist Inspection): The Government will perform the Pre-Final Inspection to verify that the facility is complete and ready to be occupied. The Contractor shall

ensure that all items on the Government Punchlist have been corrected before notifying the Government, so that a Final Acceptance Inspection with the customers or end users can be scheduled. Correct items noted on the Pre-Final Inspection in a timely manner. These inspections and any deficiency corrections required by this paragraph need to be accomplished within the time slated for completion of the entire work or any particular increment of the work if the project is divided into increments by separate construction completion dates.

- C. Final Acceptance Inspection: The Contractor's QC Inspection personnel, plus the superintendent or other primary management person, and the COR are required to attend the Final Acceptance Inspection. Additional Government personnel may also be in attendance. The Final Acceptance Inspection will be formally scheduled by the COR based upon results of the Pre-Final Inspection. The Contractor shall notify the COR 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 FOR THE DAILY LOG OF CONSTRUCTION

- A. See specification 01 10 10-SN SPECIAL NOTES.
- B. 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 equipment with hours worked, idle, or down for repair.
 3. Work performed each day, giving location, description, and by whom.
 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.
- C. 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.
- D. Furnish the Daily Log of construction to the COR daily (or weekly if allowed by the COR) via the government's approved FTP site, OpCenter.
- E. Daily Logs need not be submitted for days on which no work is performed.
- F. As a minimum, prepare and submit a report for every seven (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 QCM. Include copies of test reports and copies of reports prepared by all subordinate QC personnel within the QCM 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%2045%2000.00%2020 quality control reports.pdf](https://www.wbdg.org/FFC/NAVGRAPH/01%2045%2000.00%2020%20quality%20control%20reports.pdf)
- B. Refer to Specification Section 01 01 10 (SN) SPECIAL NOTES APPENDEX-STANDARD REQUIRED FORMS/TABLES/MATRICES, for examples of forms from VA Milwaukee.

3.11 NOTIFICATION OF NONCOMPLIANCE:

- A. The Contracting Officer 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.

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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. Testing services retained by the VA shall not relieve the contractor of providing his own testing services guaranteeing his work meeting these requirements. Testing services retained by the VA shall also not provide conclusive results to substantiate the contractor's work.

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 5.5 lb. Rammer and a 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 410 lb. Rammer and a 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/ft³)

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

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 and 150 ksi 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 Resident Engineer. When it appears materials furnished, or work performed by Contractor fail to meet construction contract requirements, Testing Laboratory shall direct attention of Resident Engineer to such failure.
- C. Written Reports: Testing laboratory shall submit test reports to Resident Engineer, Contractor, unless other arrangements are agreed to in writing by the Resident Engineer. Submit reports of tests that fail to meet construction contract requirements on colored paper.
- D. Verbal Reports: Give verbal notification to Resident Engineer immediately of any irregularity.

PART 2 - PRODUCTS: (NOT USED)

PART 3 - EXECUTION

3.1 EARTHWORK: (NOT USED)

3.2 FOUNDATION PILES: (NOT USED)

3.3 FOUNDATION CAISSONS: (NOT USED)

3.4 LANDSCAPING: (NOT USED)

3.5 ASPHALT CONCRETE PAVING: (NOT USED)

3.6 SITE WORK CONCRETE: (NOT USED)

3.7 POST-TENSIONING OF CONCRETE: (NOT USED)

3.8 CONCRETE: SEE SECTION 03 33 00 (ARCHITECTURAL CONCRETE REPAIRS): (NOT USED)

3.9 REINFORCEMENT: NOT USED 3.10 SHOTCRETE: (NOT USED)

3.11 PRESTRESSED CONCRETE: (NOT USED)

3.12 ARCHITECTURAL PRECAST CONCRETE: (NOT USED)

3.13 MASONRY: SEE SECTIONS 04 05 13 (MASONRY MORTARING) AND 04 20 00 (UNIT MASONRY): (NOT USED)

3.14 STRUCTURAL STEEL: (NOT USED)

3.15 STEEL DECKING: (NOT USED)

3.16 SHEAR CONNECTOR STUDS: (NOT USED)

3.17 SPRAYED-ON FIREPROOFING: (NOT USED)

3.18 TYPE OF TEST: (NOT USED)

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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 affect 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. Air Pollution: Means the presence in the atmosphere of one or more air contaminants in such quantities and of such duration as is or tends to be injurious to human health or welfare, animal or plant life, or property, or would unreasonably interfere with the enjoyment of life or property.
 2. Chemical Waste: Petroleum products, bituminous materials, salts, acids, alkalis, herbicides, pesticides, organic chemicals, and inorganic wastes.
 3. Debris: Combustible and noncombustible wastes, such as leaves, tree trimmings, ashes, and waste materials resulting from construction or maintenance and repair work.
 4. Hazardous Waste: By-products of society that can pose a substantial or potential hazard to human health or the environment when improperly managed. It is a solid waste that possesses at least one of four characteristics (ignitability, corrosivity, reactivity and toxicity) or appears on special Wisconsin Department of Natural Resources (DNR) or U.S. Environmental Protection Agency (EPA) lists.

The regulatory definition of hazardous waste is found in Wis. Admin. Code § NR 661.

5. Rubbish: Combustible and noncombustible wastes such as paper, boxes, glass and crockery, metal and lumber scrap, tin cans, and bones.
6. Sanitary Wastes:
 - a. Sewage: Means the water-carried wastes created in and to be conducted away from residences, industrial establishments, and public buildings as defined in Wis. Stat. § 101.01, with such surface water or groundwater as may be present.
 - b. Garbage: Refuse and scraps resulting from preparation, cooking, dispensing, and consumption of food.
7. Sediment: Soil and other debris that has been eroded and transported by runoff water or deposited by runoff away from its original location.
8. Solid Waste: Any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant or air pollution control facility and other discarded or salvageable materials, including solid, liquid, semisolid, or contained gaseous materials resulting from industrial, commercial, mining and agricultural operations, and from community activities, but does not include solids or dissolved material in domestic sewage, or solid or dissolved materials in irrigation return flows or industrial discharges which are point sources subject to permits under Wis. Stat. § 283, or source material, as defined in Wis. Stat. § 254.31(10), special nuclear material, as defined in Wis. Stat. § 254.31(11), or byproduct material, as defined in Wis. Stat. § 254.31(1).
9. 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.

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
- C. Wisconsin DNR Definitions webpage:
<http://dnr.wi.gov/topic/Waste/Definitions.html>
- D. Wis. Admin Code § NR 141, NR 400, NR 500, NR 660, and NR 661.
- E. Wisconsin Statute Ch. 289
- F. Wisconsin DNR Solid and Hazardous Waste Codes and Statutes webpage:
<http://dnr.wi.gov/topic/Waste/Laws.html>

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 Contracting Officer's Representative (COR) 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 Contracting Officer for approval, a written and 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 material storage areas, structures, and sanitary facilities
- 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.
- l. Inclusion of "best management practices" and methodologies.

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, topsoil, and landforms without permission from the COR. Do not fasten or attach ropes, cables, or guys to trees for anchorage

unless specifically authorized, or where special emergency use is permitted. Provide erosion control plans, in phases where required.

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, landforms, 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. Wisconsin DNR has storm water technical standards, models, and best management practices (BMPs) available on their website:
<http://dnr.wi.gov/topic/stormwater/standards/>. Use the technical standards to plan, design, install, and maintain erosion/sediment control and storm water management practices to assist in complying with Wis. Admin Code § NR 151.
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. Utilize informational guidance provided by the Wisconsin DNR on their webpage

(<http://dnr.wi.gov/topic/stormwater/standards/>) regarding storm water technical standards, models, and BMPs. Use the technical standards to plan, design, install, and maintain erosion/sediment control and storm water management practices to assist in complying with Wis. Admin. Code § NR 151.

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 Government property to limit spoil to areas 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. Reference specification 01 74 19 for waste management requirements.
 10. Store hazardous/chemical waste away from the work areas in corrosion-resistant containers that are compatible with the waste and dispose of waste in accordance with Federal, State, and local regulations. Hazardous waste must be labeled according to 40 CFR 262.15.
 11. Handle discarded materials other than those included in the solid waste category as directed by the COR.
- 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, and 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. Utilize [U.S. Fish and Wildlife Service \(fws.gov\)](https://www.fws.gov) to research threatened and endangered species in the area.
- 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 Wisconsin and Federal emission and performance laws and standards. Maintain ambient air quality standards set by the Environmental Protection Agency and Wisconsin DNR, 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 at all times, including weekends, holidays, and hours when work is not in progress. Dust is not allowed to infiltrate the interior spaces of the building.
 2. Hydrocarbons and Carbon Monoxide: Control monoxide emissions from equipment to Federal, State of Wisconsin, and facility air permit allowable limits.
 3. 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 COR. 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 4:00 p.m. unless otherwise permitted by local ordinance or the COR. 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 exterior construction equipment noise levels at 30 feet (dBA) from source.

3. Measure sound level for noise exposure due to the construction at least once every working day while work is being performed above 55 dB(A) noise level. Measure exterior noise exposure 30 feet from the noise source. Measure interior noise exposure within the room or space directly adjacent to the exterior work. Maximum of 55db(A) is allowed to transfer to the interior of the building.in level 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 three to six feet in front of any building face. Submit the recorded information to the COR 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 COR. 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. When the contractor's work blocks doors and/or exits, changes paths, etc., the General Contractor is to provide all temporary signage to reroute personnel and block the doors or exits. Locations to be determined based on the ILSM

PART 2 PRODUCTS

2.1 TEMPORARY SIGNS

- A. Fabricate from 110-pound mat finish white paper.
B. Cut to 4-inch wide by 12-inch-long size tag.
C. Punch 1/8-inch diameter hole centered on 4-inch dimension of tag. Edge of Hole spaced approximately 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 0.0120-inch thick, attach to tag with twist tie, leaving 6-inch-long free ends.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install temporary signs attached to room door frame or room doorknob, lever, or pull for doors on corridor openings.
B. Mark on signs with felt tip marker having approximately 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.

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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 waste materials.
 - 4. Salvage of existing materials and items for reuse or resale.
 - 5. Recycling materials that cannot be reused or sold.
- D. At a minimum the following waste categories shall be diverted from landfills:
 - 1. Clean/Uncontaminated Soil (Note: The Clement J. Zablocki VA Medical Center (5000 W. National Ave. Milwaukee, WI 53295) is listed on the Wisconsin Department of Natural Resources (DNR) Bureau for Remediation and Redevelopment Tracking System (BRRTS) [BRRTS No. 02-41-563846]. Soils excavated at the Medical Center are typically contaminated with low levels of lead, petroleum volatile organic compounds (PVOCs), and polycyclic aromatic hydrocarbons (PAHs). All soil spoils are assumed to be contaminated unless an exemption is approved. If an exemption from the landfill requirement is desired, the contractor is responsible for all expenses related to sample collection, laboratory analysis, reporting, interpretation of the results, coordinating with Wisconsin Department of Natural Resources (DNR) to obtain permission to dispose of soils at a non-licensed landfill or other site. For soil spoils that must be disposed of offsite without an approved exemption from the DNR, the contractor is responsible for obtaining approval from a licensed landfill prior to disposal. The contractor must consult with the Milwaukee VAMC

Green Environmental Management System (GEMS) Coordinator at least four weeks prior to shipment of soil spoils offsite so as not to cause any project delays.)

2. Concrete and masonry.
 3. Clean dimensional wood and palette wood.
 4. Green waste biodegradable landscaping materials.
 5. Engineered wood products plywood, particle board, etc.
 6. Metal products e.g., steel, wire, beverage containers, copper, etc.
 7. Cardboard, paper, and packaging.
 8. Bitumen roofing materials.
 9. Plastics (e.g., ABS, PVC).
 10. Insulation.
 11. Paint.
- E. The following regulated wastes require special handling, storage and disposal and must be segregated:
1. Hazardous Wastes (including oil-based paint, cleaning chemicals, other miscellaneous chemicals, etc.)
 2. Used Oil
 3. Electronical Waste (E-waste)
 4. Universal Wastes:
 - a. Aerosol Cans
 - b. Antifreeze
 - c. Batteries
 - d. Lamps
 - e. Mercury-containing Equipment (thermometers, switches, etc.)
 - f. Pesticides
 5. Polychlorinated biphenyl (PCB) ballasts and non-PCB ballasts

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, and federal regulations. The Wisconsin DNR C&D website <https://dnr.wi.gov/topic/Demo/Debris.html> provides guidance and resources for diverting construction waste from the landfill.
- 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. EPA Subtitle C Landfill: A landfill which are authorized under the Resource Conservation and Recovery Act (RCRA) to accept hazardous waste for disposal.
- G. EPA Subtitle D Landfill: A landfill that accepts non-hazardous resources such as household, commercial and industrial waste resulting from construction, remodeling, repair and demolition operations.
- H. Hazardous Waste: By-products of society that can pose a substantial or potential hazard to human health or the environment when improperly managed. It is a solid waste that possesses at least one of four characteristics (ignitability, corrosivity, reactivity and toxicity) or appears on special DNR or EPA lists. The regulatory definition of hazardous waste is found in s. NR 661, Wis. Adm. Code. Examples of hazardous waste include, but are not limited to: xylene, mineral oils, toluene, acetone, kerosene, and petroleum distillates.
- I. 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.
- J. Inert Fill: A facility that can legally accept inert waste, such as asphalt and concrete exclusively for the purpose of disposal.
- K. 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.
- L. Mixed Debris: Loads that include commingled recyclable and non-recyclable materials generated at the construction site.

- M. 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.
- N. 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.
- O. 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.
- P. 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.
- Q. Reuse: Materials that are recovered for use in the same form, on-site or off-site.
- R. Return: To give back reusable items or unused products to vendors for credit.
- S. Salvage: To remove waste materials from the site for resale or re-use by a third party.
- T. Solid Waste: Any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant or air pollution control facility and other discarded or salvageable materials, including solid, liquid, semisolid, or contained gaseous materials resulting from industrial, commercial, mining and agricultural operations, and from community activities, but does not include solids or dissolved material in domestic sewage, or solid or dissolved materials in irrigation return flows or industrial discharges which are point sources subject to permits under Wis. Stat. § 283, or source material, as defined in Wis.

Stat. § 254.31(10), special nuclear material, as defined in Wis. Stat. § 254.31(11), or byproduct material, as defined in Wis. Stat. § 254.31(1).

- U. Source-Separated Materials: Materials that are sorted by type at the site for the purpose of reuse and recycling.
- V. 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, and within 60 days of the NTP, furnish to the COR a written Construction Waste Management Plan (CWMP). A sample CWMP is available from the COR or Green Environmental Management System (GEMS) Coordinator. The plan shall include, but not be limited to, the following information:
 - 1. Procedures to be used for debris management.
 - 2. Target Waste Diversion Rate (a minimum of 50% by weight)
 - 3. Techniques to be used to minimize waste generation.
 - 4. 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 Subtitle D Landfill.
 - c. List of each regulated waste item and quantity proposed to be taken to a Subtitle C Landfill
 - 5. 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.

- a) The names and locations of mixed debris reuse and recycling facilities or sites.
 - b) The names and locations of trash disposal landfill facilities or sites.
 - c) Documentation that the facilities or sites are approved to receive the materials.
6. Designated Manager responsible for instructing personnel, supervising, documenting and administer over meetings relevant to the CWMP.
- B. 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. Monthly summary must also include:
1. Target waste diversion rate by material and an overall diversion rate.
- C. Final report documenting the results of implementation of the CWMP.

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): LEED Green Building Rating System for New Construction.
1. Green Building Initiative (GBI): Green Globes for New Construction 2019.

1.7 RECORDS (NOT USED)

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. Contractor shall provide waste carts and dumpster for the project. Coordinate location of dumpster with the COR

prior to mobilization and indicate location on CWMP. Contractor will be able to locate dumpster at the VA loading dock during demolition activities only but shall be responsible for securing the dumpster so that it can only be used by the Contractor and his agents.

- 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, and disposed of according to local, state, and federal regulations. These regulations include City of Milwaukee Solid Waste Regulations Chapter 79, Wis. Admin Code § NR 660-679, and 40 CFR 239-282.

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 (i.e. waste manifest).
- 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.
- D. Submit a copy of all hazardous waste and special waste manifests to the COR.

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SECTION 02 41 00
DEMOLITION

PART 1 - GENERAL

1.1 DESCRIPTION:

- A. This section specifies demolition and removal of portions of buildings and other structures and debris from trash dumps shown.

1.2 RELATED WORK:

- B. Safety Requirements: Section 01 35 26 Safety Requirements Article, ACCIDENT PREVENTION PLAN (APP).
- C. Disconnecting utility services prior to demolition: Section 01 00 00, GENERAL REQUIREMENTS.
- D. Reserved items that are to remain the property of the Government: Section 01 00 00, GENERAL REQUIREMENTS.
- E. Asbestos Removal: Section 02 82 11, TRADITIONAL ASBESTOS ABATEMENT.
- G. Environmental Protection: Section 01 57 19, TEMPORARY ENVIRONMENTAL CONTROLS.
- H. Construction Waste Management: Section 01 74 19 CONSTRUCTION WASTE MANAGEMENT.
- I. Infectious Control: Section 01 35 26, SAFETY REQUIREMENTS.

1.3 PROTECTION:

- A. Perform demolition in such manner as to eliminate hazards to persons and property; to minimize interference with use of adjacent areas, utilities and structures or interruption of use of such utilities; and to provide free passage to and from such adjacent areas of structures. Comply with requirements of GENERAL CONDITIONS Article, ACCIDENT PREVENTION.
- B. Provide safeguards, including warning signs, barricades, temporary fences, warning lights, and other similar items that are required for protection of all personnel during demolition and removal operations. Comply with requirements of Section 01 00 00, GENERAL REQUIREMENTS, Article PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES AND IMPROVEMENTS.
- D. Provide enclosed dust chutes with control gates to carry debris to truck beds and govern flow of material into truck. Provide overhead bridges of tight board or prefabricated metal construction at dust chutes to protect persons and property from falling debris.

- E. Prevent spread of flying particles and dust. Sprinkle rubbish and debris with water to keep dust to a minimum. Do not use water if it results in hazardous or objectionable condition such as, but not limited to; ice, flooding, or pollution. Vacuum and dust the work area daily.
- F. In addition to previously listed fire and safety rules to be observed in performance of work, include following:
 - 1. No wall or part of wall shall be permitted to fall outwardly from structures.
 - 3. Wherever a cutting torch or other equipment that might cause a fire is used, provide and maintain fire extinguishers nearby ready for immediate use. Instruct all possible users in use of fire extinguishers.
 - 4. Keep hydrants clear and accessible at all times. Prohibit debris from accumulating within a radius of 15 feet of fire hydrants.
- G. Before beginning any demolition work, the Contractor shall survey the site and examine the drawings and specifications to determine the extent of the work. The contractor shall take necessary precautions to avoid damages to existing items to remain in place, to be reused, or to remain the property of the Medical Center; any damaged items shall be repaired or replaced as approved by the COR. The Contractor shall coordinate the work of this section with all other work and shall construct and maintain shoring, bracing, and supports as required. The Contractor shall ensure that structural elements are not overloaded and shall be responsible for increasing structural supports or adding new supports as may be required as a result of any cutting, removal, or demolition work performed under this contract. Do not overload structural elements. Provide new supports and reinforcement for existing construction weakened by demolition or removal works. Repairs, reinforcement, or structural replacement must have COR approval.
- H. The work shall comply with the requirements of Section 01 57 19, TEMPORARY ENVIRONMENTAL CONTROLS.
- I. The work shall comply with the requirements of Section 01 00 00, GENERAL REQUIREMENTS and Section 01 35 26, SAFETY REQUIREMENTS.

1.4 UTILITY SERVICES: NOT USED

PART 2 - PRODUCTS: NOT USED

PART 3 - EXECUTION

3.1 DEMOLITION:

- A. Debris, including brick, concrete, stone, metals and similar materials shall become property of Contractor and shall be disposed of by him daily, off the Medical Center Property to avoid accumulation at the demolition site. Materials that cannot be removed daily shall be stored in areas specified by the COR. Contractor shall dispose debris in compliance with applicable federal, state or local permits, rules and/or regulations.
- B. In removing portions of buildings more than two stories, demolish work story by story starting at highest level and progressing down to third floor level. Demolition of first and second stories may proceed simultaneously.
- C. Remove and legally dispose of all materials, other than earth to remain as part of project work, from any trash dumps shown. Materials removed shall become property of contractor and shall be disposed of in compliance with applicable federal, state or local permits, rules and/or regulations. All materials in the indicated trash dump areas shall be included as part of the lump sum compensation for the work of this section. Materials that are discovered to be hazardous, shall be handled as unforeseen. The removal of hazardous material shall be referred to Hazardous Materials specifications.

3.2 TEMPORARY PROTECTION:

- A. Provide temporary bracing, shoring, needling and support during demolition, cutting, remodeling and related new construction necessary for the execution of the work and the protection of persons and property. Perform all work with appropriate supports, protection and methods to prevent collapse, settling or damage to property or persons. Provide adequate supports for the loads to be carried, with loads properly distributed, and including to lower levels, if necessary.
- B. Provide protective covering and enclosures necessary to prevent damage to existing spaces and materials to remain.

3.3 CLEAN-UP:

- A. On completion of work of this section and after removal of all debris, leave site in clean condition satisfactory to COR. Clean-up shall

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include off the Medical Center disposal of all items and materials not
required to remain property of the Government as well as all debris and
rubbish resulting from demolition operations.

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SECTION 02 42 00
CUTTING, REMOVAL, DEMOLITION, RESTORATION AND PATCHING

PART 1 GENERAL

1.1 SCOPE:

- A. Refer to SECTION 01 00 00 for special requirements, protection, constraints, timing of work, scheduling of work, enclosures and similar requirements relating to this section.
- B. This section covers cutting, demolition, removal work, patching, leveling and restoration work as necessary to accomplish and complete all work under this contract, including any relocation or reuse of existing materials, equipment, systems, or other work, as well as the disposition of salvaged materials or debris. This Section applies to all work under this contract, including general construction, mechanical and electrical work.
- C. Contractor and his subcontractors shall examine the spaces/work site themselves to determine the actual conditions and requirements. All removals, demolition, cutting, restoration, new installations and other work shall be accomplished to transform the existing spaces and conditions to the new conditions required under the Contract, as well as to accomplish all tie-in work of new to existing.
- D. It is the intent that, unless specifically shown on the schedules, or is inherent in the work to be accomplished under the general construction work of the area, that each contractor shall perform the demolition, cutting, removals, relocations, patching and leveling, and restoration as will be required to accomplish the work under their contracts. All work indicated on the schedules shall be accomplished by the General Contractor.
- E. Except for general demolition of entire areas, it is the intent that at each area or space the contractor and each subcontractor shall make removals, perform cutting or demolition and accomplish relocations of work normal to his trade (i.e., Mechanical Contractor removes or relocates piping, ductwork and similar). At areas of general demolition of entire area spaces, the Mechanical Contractor shall make removals normal to their trade or may be called for, for reuse or relocation, make any relocations and cutoffs, terminate, or otherwise discontinue services that will be abandoned, shall be removed to the nearest active main. The general contractor shall then demolish or

remove all unwanted electrical or mechanical materials, items or elements in the area.

- F. Contractor is required to restore all finishes, surfaces, items, and materials as required to accommodate new finishes. For example, if wall paper, vinyl wall covering, ceramic wall tile, etc. is existing on wall, and new wall finish calls for wall to be painted, contractor is required to remove existing wall paper, vinyl wall covering, ceramic wall tile, etc. to accommodate new painted finish. These surfaces are required to be verified prior to bid, as no change to contract will be provided after award if existing finishes are clearly present.

PART 2 MATERIALS: NOT USED

PART 3 EXECUTION:

3.1 TEMPORARY PROTECTION:

- A. Provide temporary bracing, shoring, needling and support during demolition, cutting, remodeling and related new construction necessary for the execution of the work and the protection of persons and property. Perform all work with appropriate supports, protection and methods to prevent collapse, settling or damage to property or persons. Provide adequate supports for the loads to be carried, with loads properly distributed, and including to lower levels and sound bearing, if necessary.
- B. Provide protective covering and enclosures necessary to prevent damage to existing spaces and materials to remain.
- C. Provide dust proof temporary enclosures (including above ceilings) separating areas under demolition and remodeling from the remainder of the buildings as well as temporary filters at ductwork. If work produces fumes or odors that impact patient care or staff operations, granulated active carbon filters shall be provided for all HVAC intake units where operations provide these odors or fumes. Provide temporary hinged doors in temporary enclosures where necessary. Temporary and permanent doors shall be completely sealed with tape or other suitable material during demolition work and shall remain sealed until dust has settled.

3.2 MECHANICAL AND ELECTRICAL WORK EXPOSED: NOT USED

3.3 WORK OF EACH CONTRACT

- A. The contractor and each subcontractor shall carefully review the contract documents, including those primarily for other trades, with

respect to the coordination of demolition, removal and remodeling work and perform such removals normal to their respective trade as may be shown, noted, or otherwise required. Cutting and patching incidental to demolition, removal and/or remodeling of general construction work shall be construed as the work of the general contractor when shown or indicated on the general construction drawings or schedules or specifically noted or called for on documents primarily for other trades as being accomplished by the general contractor. Other contractors shall perform such other cutting, demolition, patching, replacement and restoration as may be required to accomplish their part of the work.

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SECTION 02 82 11
TRADITIONAL ASBESTOS ABATEMENT

PART 1 - GENERAL

1.1 SUMMARY OF THE WORK

- A. Contract Documents and Related Requirements: Drawings, general provisions of the contract, including general and supplementary conditions and other Division 01 specifications, shall apply to the work of this section. The contract documents show or describe the work to be done under the contract and related requirements and conditions impacting the project. Related requirements and conditions include applicable codes and regulations, notices and permits, existing site conditions and restrictions on use of the site, requirements for partial owner occupancy during the work, coordination with other work and the phasing of the work. In the event the Asbestos Abatement Contractor discovers a conflict in the contract documents and/or requirements or codes, the conflict must be brought to the immediate attention of the Contracting Officer for resolution. Whenever there is a conflict or overlap in the requirements, the most stringent shall apply. Any actions taken by the Contractor without obtaining guidance from the Contracting Officer shall become the sole risk and responsibility of the Asbestos Abatement Contractor. All costs incurred due to such action are also the responsibility of the Asbestos Abatement Contractor.
- B. Extent of Work:
1. Below is a brief description of the estimated quantities of asbestos containing materials to be abated. These quantities are for informational purposes only and are based on the best information available at the time of the specification preparation. The Contractor shall satisfy themselves of the actual quantities to be abated. Nothing in this section may be interpreted as limiting the extent of work otherwise required by this contract and related documents.
 2. Removal, clean-up and disposal of asbestos containing materials (ACM) and asbestos/waste contaminated elements or debris in an appropriate regulated area for the following approximate quantities;

4,918 linear feet (LF) of miscellaneous material including vertical, exterior caulk from between precast concrete window panels and brick facade (approximately 4,850 LF) and black flashing tar from copper flashing from the 9th Floor Atrium area (approximately 68 LF).

The Contractor is responsible for installing temporary sealants at points of abatement to ensure the building remains leak-tight after abatement and prior to construction repair activities being performed. The temporary sealants shall be installed after passing clearance for each area.

C. Related Work:

1. Section 02 41 00, DEMOLITION
2. Division 09, FINISHES

D. Tasks:

1. The work tasks are summarized briefly as follows:
 - a. Pre-abatement activities including pre-abatement meeting(s), inspection(s), notifications, permits, submittal approvals, regulated area preparations, emergency procedures arrangements, and standard operating procedures for asbestos abatement work.
 - b. Abatement activities including removal, clean-up and disposal of ACM waste, recordkeeping, security, monitoring, and inspections.
 - c. Cleaning and decontamination activities including final visual inspection, air monitoring and certification of decontamination.

E. Contractors Use of Premises:

1. The Contractor and Contractor's personnel shall cooperate fully with the VA representative/consultant to facilitate efficient use of buildings and areas within buildings. The Contractor shall perform the work in accordance with the VA specifications, drawings, phasing plan and in compliance with any/all applicable Federal, State and Local regulations and requirements.
2. The Contractor shall use the existing facilities in the building strictly within the limits indicated in contract documents as well as the approved VA Design and Construction Procedures. VA Design and Construction Procedures drawings of partially occupied buildings will show the limits of regulated areas; the placement of decontamination facilities; the temporary location of bagged waste ACM; the path of transport to outside the building; and the temporary waste storage area for each building/regulated area. Any

variation from the arrangements shown on drawings shall be secured in writing from the VA representative through the pre-abatement plan of action. The following limitations of use shall apply to existing facilities shown on drawings:

1.2 VARIATIONS IN QUANTITY

- A. The quantities and locations of ACM as indicated on the drawings and the extent of work included in this section are estimated which are limited by the physical constraints imposed by occupancy of the buildings and accessibility to ACM. Accordingly, minor variations (+/- 10 percent) in quantities of ACM within the regulated area are considered as having no impact on contract price and time requirements of this contract. Where additional work is required beyond the above variation, the contractor shall provide unit prices for newly discovered ACM and those prices shall be used for additional work required under the contractor.

1.3 STOP ASBESTOS REMOVAL

- A. If the Contracting Officer; their field representative; the facility Safety Officer/Manager or their designee, or the VA Professional Industrial Hygienist/Certified Industrial Hygienist (VPIH/CIH) presents a verbal **Stop Asbestos Removal Order**, the Contractor/Personnel shall immediately stop all asbestos removal and maintain HEPA filtered negative pressure air flow in the containment and adequately wet any exposed ACM. If a verbal Stop Asbestos Removal Order is issued, the VA shall follow-up with a written order to the Contractor as soon as it is practicable. The Contractor shall not resume any asbestos removal activity until authorized to do so in writing by the VA Contracting Officer. A stop asbestos removal order may be issued at any time the VA Contracting Officer determines abatement conditions/activities are not within VA specification, regulatory requirements or that an imminent hazard exists to human health or the environment. Work stoppage will continue until conditions have been corrected to the satisfaction of the VA. Standby time and costs for corrective actions will be borne by the Contractor, including the VPIH/CIH time. The occurrence of any of the following events shall be reported immediately by the Contractor's competent person to the VA Contracting Office or field representative using the most expeditious means (e.g., verbal or telephonic), followed up with written notification to the Contracting Officer as soon as practical. The

Contractor shall immediately stop asbestos removal/disturbance activities and initiate fiber reduction activities if:

1. Airborne PCM analysis results equal to or greater than 0.01 f/cc above background levels inside the building but outside the regulated area;
2. breach or break in regulated area containment barrier(s);
3. less than -0.02 inch WCG pressure in the regulated area;
4. serious injury/death at the site;
5. fire/safety emergency at the site;
6. respiratory protection system failure;
7. power failure or loss or inadequate use of wetting agent;
8. any visible emissions observed outside the regulated area; or
9. failure to follow project specification requirements.

1.4 DEFINITIONS

A. General: Definitions and explanations here are neither complete nor exclusive of all terms used in the contract documents, but are general for the work to the extent they are not stated more explicitly in another element of the contract documents. Drawings must be recognized as diagrammatic in nature and not completely descriptive of the requirements indicated therein.

B. Glossary:

Abatement - Procedures to control fiber release from asbestos-containing materials. Includes removal, encapsulation, enclosure, demolition, and renovation activities related to asbestos containing materials (ACM).

Adequately wet - Sufficiently mixed or penetrated with liquid to prevent the release of particulates. If visible emissions are observed coming from the ACM, then that material has not been adequately wetted.

Aerosol - Solid or liquid particulate suspended in air.

Aggressive method - Removal or disturbance of building material by sanding, abrading, grinding, or other method that breaks, crumbles, or disintegrates intact ACM.

Aggressive air sampling - EPA AHERA defined clearance sampling method using air moving equipment such as fans and leaf blowers to aggressively disturb and maintain in the air residual fibers after abatement.

AHERA - Asbestos Hazard Emergency Response Act. Asbestos regulations for schools issued in 1987.

Aircell - Pipe or duct insulation made of corrugated cardboard which contains asbestos.

Air monitoring - The process of measuring the fiber content of a known volume of air collected over a specified period of time. The NIOSH 7400 Method, Issue 3, Fifth Edition is used to determine the fiber levels in air. For personal samples, area air samples and clearance air testing using Phase Contrast Microscopy (PCM) analysis, the NIOSH Method 7402 (Issue 2, Fourth Edition) can be used when it is necessary to confirm fibers counted by PCM as being asbestos. The AHERA TEM analysis may be used for background, area samples and clearance samples when required by this specification, or at the discretion of the VPIH/CIH as appropriate.

Air sample filter - The filter used to collect fibers which are then counted. The filter is made of mixed cellulose ester (MCE) membrane for PCM (Phase Contrast Microscopy, 25 mm, 3-piece with 2 inches Static Extension Cowl, 0.8 micron pore size) and MCE for TEM (Transmission Electron Microscopy, 25 mm, 3-piece with 2 inches Static Extension Cowl, 0.45 micron pore size).

Amended water - Water to which a surfactant (wetting agent) has been added to increase the penetrating ability of the liquid.

Asbestos - Includes chrysotile, amosite, crocidolite, tremolite asbestos, anthophyllite asbestos, actinolite asbestos, and any of these minerals that have been chemically treated or altered. Asbestos also includes PACM, as defined below.

Asbestos Hazard Abatement Plan (AHAP) - Asbestos work procedures required to be submitted by the contractor before work begins.

Asbestos-containing material (ACM) - Any material containing more than one percent of asbestos.

Asbestos contaminated elements (ACE) - Building elements such as ceilings, walls, lights, or ductwork that are contaminated with asbestos.

Asbestos-contaminated soil (ACS) - Soil found in the work area or in adjacent areas such as crawlspaces or pipe tunnels which is contaminated with asbestos-containing material debris and cannot be easily separated from the material.

Asbestos-containing waste (ACW) material - Asbestos-containing material or asbestos contaminated objects requiring disposal.

Asbestos Project Monitor - Some states require that any person conducting asbestos abatement air sampling, clearance inspections and clearance air sampling be licensed as an asbestos project monitor.

Asbestos waste decontamination facility - A system consisting of drum/bag washing facilities and a temporary storage area for cleaned containers of asbestos waste. Used as the exit for waste and equipment leaving the regulated area. In an emergency, it may be used to evacuate personnel.

Authorized person - Any person authorized by the VA, the Contractor, or government agency and required by work duties to be present in regulated areas.

Authorized visitor - Any person approved by the VA; the contractor; or any government agency representative having jurisdiction over the regulated area (e.g., OSHA, Federal and State EPA).

Barrier - Any surface that isolates the regulated area and inhibits fiber migration from the regulated area.

Containment Barrier - An airtight barrier consisting of walls, floors, and/or ceilings of sealed plastic sheeting which surrounds and seals the outer perimeter of the regulated area.

Critical Barrier - The barrier responsible for isolating the regulated area from adjacent spaces, typically constructed of 2-layers of 6-mil independently installed plastic sheeting (Polyethylene) secured in place at openings such as doors, windows, penetrations or any other opening into the regulated area.

Primary Barrier - Plastic barriers placed over critical barriers and exposed directly to abatement work or to secondary barrier.

Secondary Barrier - Any additional plastic barriers used to isolate and provide protection from debris during abatement work.

Breathing zone - The hemisphere forward of the shoulders with a radius of about 6 - 9 inches from the worker's nose.

Bridging encapsulant - An encapsulant that forms a layer on the surface of the ACM.

Building/facility owner - The legal entity, including a lessee, which exercises control over management and recordkeeping functions relating to a building and/or facility in which asbestos activities take place.

Bulk testing - The collection and analysis of suspect asbestos containing materials.

Certified Industrial Hygienist (CIH) - A person certified in the comprehensive practice of industrial hygiene by the American Board of Industrial Hygiene.

Class I asbestos work - Activities involving the removal of Thermal System Insulation (TSI) and surfacing ACM and Presumed Asbestos Containing Material (PACM).

Class II asbestos work - Activities involving the removal of ACM which is not thermal system insulation or surfacing material. This includes, but is not limited to, the removal of asbestos-containing wallboard, floor tile and sheeting, roofing and siding shingles, and construction mastic.

Clean room/Changing room - An uncontaminated room having facilities for the storage of employee's street clothing and uncontaminated materials and equipment.

Clearance sample - The final air sample taken after all asbestos work has been done and visually inspected. Performed by the VA's professional industrial hygiene consultant/Certified Industrial Hygienist (VPIH/CIH).

Closely resemble - The major workplace conditions which have contributed to the levels of historic asbestos exposure, are no more protective than conditions of the current workplace.

Competent person - In addition to the definition in 29 CFR 1926.32(f), one who is capable of identifying existing asbestos hazards in the workplace and selecting the appropriate control strategy for asbestos exposure, who has the authority to take prompt corrective measures to eliminate them, as specified in 29 CFR 1926.32(f); in addition, for Class I and II work who is specially trained in a training course which meets the criteria of EPA's Model Accreditation Plan (40 CFR 763) for supervisor.

Contractor's Professional Industrial Hygienist (CPIH/CIH) - The asbestos abatement contractor's industrial hygienist. The industrial hygienist must meet the qualification requirements of a PIH and may report to a certified industrial hygienist (CIH).

Count - Refers to the fiber count or the average number of fibers greater than five microns in length with a length-to-width (aspect) ratio of at least 3 to 1, per cubic centimeter of air.

Crawlspace - An area which can be found either in or adjacent to the work area. This area has limited access and egress and may contain asbestos materials and/or asbestos contaminated soil.

Decontamination area/unit - An enclosed area adjacent to and connected to the regulated area and consisting of an equipment room, shower room, and clean room, which is used for the decontamination of workers, materials, and equipment that are contaminated with asbestos.

Demolition - The wrecking or taking out of any load-supporting structural member and any related razing, removing, or stripping of asbestos products.

Disposal bag - Typically 6-mil thick sift-proof, dustproof, leak-tight container used to package and transport asbestos waste from regulated areas to the approved landfill. Each bag/container must be labeled/marked in accordance with EPA, OSHA and DOT requirements.

Disturbance - Asbestos Operations and Maintenance Activities (OSHA Class III) that disrupt the matrix of ACM or PACM, crumble or pulverize ACM or PACM, or generate visible debris from ACM or PACM. Disturbance includes cutting away small amounts of ACM or PACM, no greater than the amount that can be contained in one standard sized glove bag or waste bag in order to access a building component. In no event shall the amount of ACM or PACM so disturbed exceed that which can be contained in one glove bag or disposal bag, which shall not exceed 60 inches in length or width.

Drum - A rigid, impermeable container made of cardboard fiber, plastic, or metal which can be sealed in order to be sift-proof, dustproof, and leak-tight.

Employee exposure - The exposure to airborne asbestos that would occur if the employee were not wearing respiratory protection equipment.

Encapsulant - A material that surrounds or embeds asbestos fibers in an adhesive matrix and prevents the release of fibers.

Encapsulation - Treating ACM with an encapsulant.

Enclosure - The construction of an air tight, impermeable, permanent barrier around ACM to control the release of asbestos fibers from the material and also eliminate access to the material.

Equipment room - A contaminated room located within the decontamination area that is supplied with impermeable bags or containers for the disposal of contaminated protective clothing and equipment.

Fiber - A particulate form of asbestos, 5 microns or longer, with a length to width (aspect) ratio of at least 3 to 1.

Fibers per cubic centimeter (f/cc) - Abbreviation for fibers per cubic centimeter, used to describe the level of asbestos fibers in air.

Filter - Media used in respirators, vacuums, or other machines to remove particulate from air.

Firestopping - Material used to close the open parts of a structure in order to prevent a fire from spreading.

Friable asbestos containing material - Any material containing more than one (1) percent asbestos as determined using the method specified in 40 CFR 763, Polarized Light Microscopy, that, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure.

Glovebag - Not more than a 60 x 60 inch impervious plastic bag-like enclosure affixed around an asbestos-containing material, with glove-like appendages through which materials and tools may be handled.

High efficiency particulate air (HEPA) filter - An ASHRAE MERV 17 filter capable of trapping and retaining at least 99.97 percent of all mono-dispersed particles of 0.3 micrometers in diameter.

HEPA vacuum - Vacuum collection equipment equipped with a HEPA filter system capable of collecting and retaining asbestos fibers.

Homogeneous area - An area of surfacing, thermal system insulation or miscellaneous ACM that is uniform in color, texture and date of application.

HVAC - Heating, Ventilation and Air Conditioning

Industrial hygienist (IH) - A professional qualified by education, training, and experience to anticipate, recognize, evaluate and develop controls for occupational health hazards. Meets definition requirements of the American Industrial Hygiene Association (AIHA).

Industrial hygienist technician (IH Technician) - A person working under the direction of an IH or CIH who has special training, experience, certifications and licenses required for the industrial hygiene work assigned. Some states require that an industrial hygienist technician conducting asbestos abatement air sampling, clearance

inspection and clearance air sampling be licensed as an asbestos project monitor.

Intact - The ACM has not crumbled, been pulverized, or otherwise deteriorated so that the asbestos is no longer likely to be bound with its matrix.

Lockdown - Applying encapsulant, after a final visual inspection, on all abated surfaces at the conclusion of ACM removal prior to removal of critical barriers.

National Emission Standards for Hazardous Air Pollutants (NESHAP) - EPA's rule to control emissions of asbestos to the environment (40 CFR part 61, Subpart M).

Negative initial exposure assessment - A demonstration by the employer which complies with the criteria in 29 CFR 1926.1101 (f)(2)(iii), that employee exposure during an operation is expected to be consistently below the PEL or Excursion Limit (EL).

Negative pressure - Air pressure which is lower than the surrounding area, created by exhausting air from a sealed regulated area through HEPA equipped filtration units. OSHA requires maintaining -0.02 inch water column gauge inside the negative pressure enclosure.

Negative pressure respirator - A respirator in which the air pressure inside the facepiece is negative during inhalation relative to the air pressure outside the respirator facepiece.

Non-friable ACM - Material that contains more than 1 percent asbestos but cannot be crumbled, pulverized, or reduced to powder by hand pressure.

Organic vapor cartridge - The type of cartridge used on air purifying respirators to remove organic vapor hazardous air contaminants.

Outside air - The air outside buildings and structures, including, but not limited to, the air under a bridge or in an open ferry dock.

Owner/operator - Any person who owns, leases, operates, controls, or supervises the facility being demolished or renovated or any person who owns, leases, operates, controls, or supervises the demolition or renovation operation, or both.

Penetrating encapsulant - Encapsulant that is absorbed into the ACM matrix without leaving a surface layer.

Permissible exposure limit (PEL) - The level of exposure OSHA allows for as an eight (8) hour time-weighted average (TWA). For asbestos

fibers, the eight (8) hour time-weighted average PEL is 0.1 fibers per cubic centimeter (0.1 f/cc) of air and the 30-minute Excursion Limit (EL) is 1.0 fibers per cubic centimeter (1 f/cc).

Personal protective equipment (PPE) - equipment designed to protect user from injury and/or specific job hazard. Such equipment may include protective clothing, hard hats, safety glasses, fall protection, and respirators.

Personal sampling/monitoring - Representative air samples obtained in the breathing zone for one or more workers within the regulated area using a filter cassette and a calibrated air sampling pump to determine asbestos exposure.

Pipe tunnel - An area, typically located adjacent to mechanical spaces or boiler rooms in which the pipes servicing the heating system in the building are routed to allow the pipes to access heating elements. These areas may contain asbestos pipe insulation, asbestos fittings, debris or asbestos-contaminated soil.

Polarized light microscopy (PLM) - Light microscopy using dispersion staining techniques and refractive indices to identify and quantify the type of asbestos present in a bulk sample.

Polyethylene sheeting - Strong plastic barrier material 4 to 6-mils thick, semi-transparent, flame retardant per NFPA 241.

Positive/negative fit check - A method of verifying the seal of a facepiece respirator by temporarily occluding the filters and breathing in (inhaling) and then temporarily occluding the exhalation valve and breathing out (exhaling) while checking for inward or outward leakage of the respirator, respectively.

Presumed ACM (PACM) - Thermal system insulation, surfacing, and flooring material installed in buildings prior to 1981. If the building owner has actual knowledge, or should have known through the exercise of due diligence that other materials are ACM, they too must be treated as PACM. The designation of PACM may be rebutted pursuant to 29 CFR 1926.1101 (k) (5).

Professional IH - An IH who meets the definition requirements of AIHA; meets the definition requirements of OSHA as a "Competent Person" at 29 CFR 1926.1101 (b); has completed two specialized EPA approved courses on management and supervision of asbestos abatement projects; has formal training in respiratory protection and waste disposal; and has a

minimum of four projects of similar complexity with this project of which at least three projects serving as the supervisory IH. The PIH may be either the VA's PIH (VPIH/CIH) or Contractor's PIH (CPIH/CIH).

Project designer - A person who has successfully completed the training requirements for an asbestos abatement project designer as required by 40 CFR 763 Subpart E, Appendix C, Part I; (B) (5).

Assigned protection factor - A value assigned by OSHA/NIOSH to indicate the expected protection provided by each respirator class, when the respirator is properly selected and worn correctly. The number indicates the reduction of exposure level from outside to inside the respirator facepiece.

Qualitative fit test (QLFT) - A fit test using a challenge material that can be sensed by the wearer if leakage in the respirator occurs.

Quantitative fit test (QNFT) - A fit test using a challenge material which is quantified outside and inside the respirator thus allowing the determination of the actual fit factor.

Regulated area - An area established by the employer to demarcate where Class I, II, III asbestos work is conducted, and any adjoining area where debris and waste from such asbestos work may accumulate; and a work area within which airborne concentrations of asbestos exceed, or there is a reasonable possibility they may exceed the PEL.

Regulated ACM (RACM) - Friable ACM; Category I non-friable ACM that has become friable; Category I non-friable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading or; Category II non-friable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of the demolition or renovation operation.

Removal - All operations where ACM, PACM and/or RACM is taken out or stripped from structures or substrates, including demolition operations.

Renovation - Altering a facility or one or more facility components in any way, including the stripping or removal of asbestos from a facility component which does not involve demolition activity.

Repair - Overhauling, rebuilding, reconstructing, or reconditioning of structures or substrates, including encapsulation or other repair of ACM or PACM attached to structures or substrates.

Shower room - The portion of the PDF where personnel shower before leaving the regulated area.

Supplied air respirator (SAR) - A respiratory protection system that supplies minimum Grade D respirable air per ANSI/Compressed Gas Association Commodity Specification for Air, G-7.1-2018.

Surfacing ACM - A material containing more than 1 percent asbestos that is sprayed, troweled on or otherwise applied to surfaces for acoustical, decorative, fireproofing and other purposes.

Surfactant - A chemical added to water to decrease water's surface tension thus making it more penetrating into ACM.

Thermal system ACM - A material containing more than 1 percent asbestos applied to pipes, fittings, boilers, breeching, tanks, ducts, or other structural components to prevent heat loss or gain.

Transmission electron microscopy (TEM) - A microscopy method that can identify and count asbestos fibers.

VA Professional Industrial Hygienist (VPIH/CIH) - The Department of Veterans Affairs Professional Industrial Hygienist must meet the qualifications of a PIH, and may report to a Certified Industrial Hygienist (CIH).

VA Representative - The VA official responsible for on-going project work.

VA Total - means a building or substantial part of the building is completely removed, torn or knocked down, bulldozed, flattened, or razed, including removal of building debris.

Visible emissions - Any emissions, which are visually detectable without the aid of instruments, coming from ACM/PACM/RACM/ACS or ACM waste material.

Waste/Equipment decontamination facility (W/EDF) - The area in which equipment is decontaminated before removal from the regulated area.

Waste generator - Any owner or operator whose act or process produces asbestos-containing waste material.

Waste shipment record - The shipping document, required to be originated and signed by the waste generator, used to track and substantiate the disposition of asbestos-containing waste material.

Wet cleaning - The process of thoroughly eliminating, by wet methods, any asbestos contamination from surfaces or objects.

C. Referenced Standards Organizations: See Section 01 42 19 REFERENCED STANDARDS.

1.5 APPLICABLE CODES AND REGULATIONS

A. General Applicability of Codes, Regulations, and Standards:

1. All work under this contract shall be done in strict accordance with all applicable Federal, State, and Local regulations, standards and codes governing asbestos abatement, and any other trade work done in conjunction with the abatement. All applicable codes, regulations and standards are adopted into this specification and will have the same force and effect as this specification.
2. The most recent edition of any relevant regulation, standard, document or code shall be in effect. Where conflict among the requirements or with these specifications exists, the most stringent requirement(s) shall be utilized.
3. Copies of all standards, regulations, codes and other applicable documents, including this specification and those listed in Section 1.5 shall be available at the worksite in the clean change area of the worker decontamination system and/or the Contractor's on-site Field Office. These standards, regulations, codes and other applicable documents, including this specification and those listed in Section 1.5 may be made available electronically.

B. Asbestos Abatement Contractor Responsibility: The Asbestos Abatement Contractor (Contractor) shall assume full responsibility and liability for compliance with all applicable Federal, State and Local regulations related to any and all aspects of the asbestos abatement project. The Contractor is responsible for providing and maintaining training, accreditations, medical exams, medical records, personal protective equipment (PPE), respiratory protection, and respirator fit testing, as required by applicable Federal, State and Local regulations. The Contractor shall hold the VA and VPIH/CIH consultants harmless for any Contractor's failure to comply with any applicable work, packaging, transporting, disposal, safety, health, or environmental requirement on the part of himself, his employees, or his subcontractors. The Contractor will incur all costs of the CPIH/CIH, including all sampling/analytical costs to assure compliance with OSHA/EPA/State/Local requirements related to failure to comply with the regulations applicable to the work.

C. Federal Requirements:

1. Federal requirements which govern asbestos abatement include, but are not limited to, the following regulations:

- a. Occupational Safety and Health Administration (**OSHA**):

- 1) Title 29 CFR 1926.1101 - Construction Standard for Asbestos
- 2) Title 29 CFR 1926 Subpart E - Personal Protective Equipment and Life Saving Equipment
- 3) Title 29 CFR 1910.134 - Respiratory Protection
- 4) Title 29 CFR 1926 - Construction Industry Standards
- 5) Title 29 CFR 1926.33 - Access to Employee Exposure and Medical Records
- 6) Title 29 CFR 1926.59 same as 1910.1200 - Hazard Communication
- 7) Title 29 CFR 1926 Subpart C - General Safety and Health Provisions and Subpart D - Occupational Health and Environmental Controls

- b. Environmental Protection Agency (**EPA**):

- 1) 40 CFR 61 Subpart M - National Emission Standard for Hazardous Air Pollutants - Asbestos.
- 2) 40 CFR 763 - Asbestos Hazard Emergency Response Act (AHERA) and Asbestos Hazard Abatement Reauthorization Act (ASHARA)

- c. Department of Transportation (**DOT**):

- 1) Title 49 CFR 171 - 180 - Transportation

D. State Requirements:

1. State requirements that apply to the asbestos abatement work, disposal, clearance, etc., include, but are not limited to, the following:

- a. Wisconsin Statute Chapter 254, Environmental Health
- b. Wisconsin Administrative Code Chapter DHS 159, Certification and Training Course Requirements for Asbestos Activities
- c. Wisconsin Administrative Code Chapter NR 447, Control of Asbestos Emissions
- d. Wisconsin Administrative Code Chapter NR 502, Solid Waste Storage, Transportation, Transfer, Incineration, Air Curtain Destructors, Processing, Wood Burning, Composting and Municipal Solid Waste Combustors
- e. Wisconsin Administrative Code Chapter NR 506, Landfill Operational Criteria

f. Wisconsin Department of Safety and Professional Services

E. Local Requirements:

1. If local requirements are more stringent than federal or state standards, the local standards are to be followed.
2. City of Milwaukee Department of Neighborhood Services Environmental Section, Asbestos Hazard Control (Chapter 66-12).

F. Standards:

1. Standards which govern asbestos abatement activities include, but are not limited to, the following:
 - a. American National Standards Institute (ANSI)/ASSP Z9.2-2018 - Fundamentals Governing the Design and Operation of Local Exhaust Systems and ANSI/ASSE Z88.2-2015 - Practices for Respiratory Protection.
 - b. Underwriters Laboratories (UL) 586-2009 - UL Standard for Safety of HEPA Filter Units, 9th Edition; ANSI Approval 2017-12-19.
2. Standards which govern encapsulation work include, but are not limited to the following:
 - a. American Society for Testing and Materials International (ASTM)
3. Standards which govern the fire and safety concerns in abatement work include, but are not limited to, the following:
 - a. National Fire Protection Association (NFPA) 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations.
 - b. NFPA 701 - Standard Methods for Fire Tests for Flame Resistant Textiles and Film.
 - c. NFPA 101 - Life Safety Code

G. EPA Guidance Documents:

1. EPA guidance documents which discuss asbestos abatement work activities are listed below. These documents are made part of this section by reference.
2. Guidance for Controlling ACM in Buildings (Purple Book) EPA 560/5-85-024
3. Asbestos Waste Management Guidance EPA 530-SW-85-007
4. A Guide to Respiratory Protection for the Asbestos Abatement Industry EPA-560-OPTS-86-001
5. Guide to Managing Asbestos in Place (Green Book) TS 799 20T July 1990

H. Notices:

1. State and Local agencies: Send written notification as required by State and Local regulations prior to beginning any work on ACM as follows:
2. City of Milwaukee Department of Neighborhood Services Environmental Section: Asbestos Project Work Sheet (accompanies asbestos project permit application at least five working days before the start of abatement).
 - a. Wisconsin Department of Natural Resources, Asbestos and Demolition Notification (at least 10 working days before the start of abatement).
 - b. Wisconsin Department of Health Services, Asbestos Abatement Notification (postmarked at least four working days before start of abatement/10 days prior to start of abatement) and subsequent updates/changes as required by DHS 159.20.
3. Copies of notifications shall be submitted to the VA for the facility's records in the same time frame notification are given to EPA, State, and Local authorities.

I. Permits/Licenses: The contractor shall apply for and have all required permits and licenses to perform asbestos abatement work as required by Federal, State, and Local regulations.

1. City of Milwaukee Department of Neighborhood Services Environmental Section: Application for Permit (Asbestos Project Permit).
2. Wisconsin Department of Health Services (training/licensing)
3. Wisconsin Department of Natural Resources (storage/waste licensing)

J. Posting and Filing of Regulations: Maintain two (2) copies of applicable Federal, State, and Local regulations. Post one copy of each in the clean room at the regulated area where workers will have daily access to the regulations and keep another hard copy or electronic copy in the Contractor's office.

K. VA Responsibilities prior to commencement of work:

1. Notify occupants adjacent to regulated areas of project dates and requirements for relocation, if needed. Arrangements must be made prior to starting work for relocation of desks, files, equipment, and personal possessions to avoid unauthorized access into the regulated area. **Note: Notification of adjacent personnel is required**

by OSHA in 29 CFR 1926.1101 (k) to prevent unnecessary or unauthorized access to the regulated area.

2. Submit to the Contractor results of background air sampling; including location of samples, person who collected the samples, equipment utilized, calibration data and method of analysis. During abatement, submit to the Contractor, results of bulk material analysis and air sampling data collected during the course of the abatement. This information shall not release the Contractor from any responsibility for OSHA compliance.

L. Emergency Action Plan and Arrangements:

1. An Emergency Action Plan shall be developed prior to commencing abatement activities and shall be agreed to by the Contractor and the VA. The Plan shall meet the requirements of 29 CFR 1926, Subpart C, Standard 1926.35 Employee Emergency Action Plans.
2. Emergency procedures shall be in written form and prominently posted in the clean room and equipment room of the decontamination unit. Everyone, prior to entering the regulated area, must read and sign these procedures to acknowledge understanding of the regulated area layout, location of emergency exits and emergency procedures.
3. Emergency planning shall include written notification of police, fire, and emergency medical personnel of planned abatement activities; work schedule; layout of regulated area; and access to the regulated area, particularly barriers that may affect response capabilities.
4. Emergency planning shall include consideration of fire, explosion, hazardous atmospheres, electrical hazards, slips/trips and falls, confined spaces, and heat stress illness. Written procedures for response to emergency situations shall be developed and employee training in procedures shall be provided.
5. Employees shall be trained in regulated area/site evacuation procedures in the event of workplace emergencies.
 - a. For non-life-threatening situations - employees injured or otherwise incapacitated shall be decontaminated following normal procedures with assistance from fellow workers, if necessary, before exiting the regulated area to obtain proper medical treatment.

- b. For life-threatening injury or illness, worker decontamination shall take least priority after measures to stabilize the injured worker, medical personnel shall remove them from the regulated area if back or neck injury is present, and secure proper medical treatment.
 - 6. Telephone numbers of any/all emergency response personnel shall be prominently posted in the clean room, along with the location of the nearest telephone.
 - 7. The Contractor shall provide verification of first aid/CPR training for personnel responsible for providing first aid/CPR. OSHA requires medical assistance within 3-4 minutes of a life-threatening injury/illness. Bloodborne Pathogen training shall also be verified for those personnel required to provide first aid/CPR.
 - 8. The Emergency Action Plan shall provide for a Contingency Plan in the event that an incident occurs that may require the modification of the standard operating procedures during abatement. Such incidents include, but are not limited to, fire; accident; power failure; negative pressure failure; and supplied air system failure. The Contractor shall detail procedures to be followed in the event of an incident assuring that asbestos abatement work is stopped and wetting is continued until correction of the problem.
- M. Pre-Construction Meeting:
- 1. Prior to commencing the work, the Contractor shall meet with the VA Certified Industrial Hygienist (VPIH/CIH) to present and review, as appropriate, the items following this paragraph. The Contractor's Competent Person(s) who will be on-site shall participate in the pre-start meeting. The pre-start meeting is to discuss and determine procedures to be used during the project. At this meeting, the Contractor shall provide:
 - a. Proof of Contractor licensing.
 - b. Proof the Competent Person(s) is trained and accredited and approved for working in this State. Verification of the experience of the Competent Person(s) shall also be presented.
 - c. A list of all workers who will participate in the project, including experience and verification of training and accreditation.

- d. A list of and verification of training for all personnel who have current first-aid/CPR training. A minimum of one person per shift must have adequate training.
- e. Current medical written opinions for all personnel working on-site meeting the requirements of 29 CFR 1926.1101 (m).
- f. Current fit-tests for all personnel wearing respirators on-site meeting the requirements of 29 CFR 1926.1101 (h) and Appendix C.
- g. A copy of the Contractor's Asbestos Hazard Abatement Plan. In these procedures, the following information must be detailed, specific for this project.
 - 1) Regulated area preparation procedures;
 - 2) Notification requirements procedure of Contractor as required in 29 CFR 1926.1101 (d) Multi-Employer Worksites;
 - 3) Decontamination area set-up/layout and decontamination procedures for employees;
 - 4) Abatement methods/procedures and equipment to be used;
 - 5) Personal protective equipment to be used.
- h. At this meeting the Contractor shall provide all submittals as required.
- i. Procedures for handling, packaging and disposal of asbestos waste.
- j. Emergency Action Plan and Contingency Plan Procedures.

1.6 PROJECT COORDINATION

- A. The following are the minimum administrative and supervisory personnel necessary for coordination of the work.
 - 1. Personnel:
 - a. Administrative and supervisory personnel shall consist of a qualified Competent Person(s) as defined by OSHA in the Construction Standards and the Asbestos Construction Standard; Contractor Professional Industrial Hygienist and Industrial Hygiene Technicians. These employees are the Contractor's representatives responsible for compliance with these specifications and all other applicable requirements.
 - b. Non-supervisory personnel shall consist of an adequate number of qualified personnel to meet the schedule requirements of the project. Personnel shall meet required qualifications. Personnel utilized on-site shall be pre-approved by the VA representative.

A request for approval shall be submitted for any person to be employed during the project giving the person's name; last four digits of social security number; qualifications; accreditation card with color picture, if required by state; Certificate of Worker's Acknowledgment; and Affidavit of Medical Surveillance and Respiratory Protection and current Respirator Fit Test.

c. Minimum qualifications for Contractor and assigned personnel are:

- 1) The Contractor has conducted within the last three (3) years, three (3) projects of similar complexity and dollar value as this project; has not been cited and penalized for serious violations of Federal (and State or Local as applicable) EPA and OSHA asbestos regulations in the past three (3) years; has adequate liability/occurrence insurance for asbestos work as required by the state; is licensed in applicable state; has adequate and qualified personnel available to complete the work; has comprehensive standard operating procedures for asbestos work; has adequate materials, equipment and supplies to perform the work.
- 2) The Competent Person has four (4) years of abatement experience of which two (2) years were as the Competent Person on the project; meets the OSHA definition of a Competent Person; has been the Competent Person on two (2) projects of similar size and complexity as this project within the past three (3) years; has completed EPA AHERA/OSHA/State/Local training requirements/accreditation(s) and refreshers; and has all required OSHA documentation related to medical and respiratory protection.
- 3) The Contractor Professional Industrial Hygienist/CIH (CPIH/CIH) shall have five (5) years of monitoring experience and supervision of asbestos abatement projects; has participated as senior IH on five (5) abatement projects, three (3) of which are similar in size and complexity as this project; has specialized EPA AHERA/OSHA training in asbestos abatement management, respiratory protection, waste disposal and asbestos inspection; has completed the NIOSH 582 Course or equivalent, Contractor/Supervisor course; and has

appropriate medical/respiratory protection
records/documentation.

- 4) The Abatement Personnel shall have completed the EPA AHERA/OSHA abatement worker course; have training on the standard operating procedures of the Contractor; has one year of asbestos abatement experience within the past three (3) years of similar size and complexity; has applicable medical and respiratory protection documentation; has certificate of training/current refresher and State accreditation/license.

d. All personnel shall be in compliance with OSHA construction safety training as applicable and submit certification.

1.7 RESPIRATORY PROTECTION

- A. General - Respiratory Protection Program: The Contractor shall develop and implement a written Respiratory Protection Program (RPP) which is in compliance with OSHA requirements found at 29 CFR 1926.1101 and 29 CFR 1910.134. ANSI Standard Z88.2-2015 provides excellent guidance for developing a respiratory protection program. All respirators used must be NIOSH approved for asbestos abatement activities. The written RPP shall, at a minimum, contain the basic requirements found at 29 CFR 1910.134 (c) - Respiratory Protection Program.
- B. Respiratory Protection Program Coordinator: The Respiratory Protection Program Coordinator (RPPC) must be identified and shall have two (2) years of experience coordinating RPP of similar size and complexity. The RPPC must submit a signed statement attesting to the fact that the program meets the above requirements.
- C. Selection and Use of Respirators: The procedure for the selection and use of respirators must be submitted to the VA as part of the Contractor's qualifications. The procedure must be written clearly enough for workers to understand. A copy of the Respiratory Protection Program must be available in the clean room of the decontamination unit or in the onsite Contractor's office, for reference by employees or authorized visitors.
- D. Minimum Respiratory Protection: Shall be a ½-mask negative pressure air purifying respirator equipped with P100 filters, provided personal air samples in the workplace remain at or below 0.1 f/cc, determined as an 8-hour TWA. Full face powered air purifying respirator equipped with P100 filters shall be required until Contractor demonstrates that

personal air samples are at or below 0.1 f/cc, determined as an 8-hour TWA. A higher level of respiratory protection shall be required, if fiber levels exceed 1 f/cc as an 8-hour TWA, inside the regulated work area. Respirator selection shall meet the requirements of 29 CFR 1926.1101 (h) and 29 CFR 1910.134 (d) (3) (i) (A) Table 1, except as indicated in this paragraph. Abatement personnel must have a respirator for their exclusive use.

- E. Medical Written Opinion: No employee shall be allowed to wear a respirator unless a physician or other licensed health care professional has provided a written determination they are medically qualified to wear the class of respirator to be used on the project while wearing whole body impermeable garments and subjected to heat or cold stress.
- F. Respirator Fit Test: All personnel wearing respirators shall have a current qualitative/quantitative fit test which was conducted in accordance with 29 CFR 1910.134 (f) and Appendix A. Quantitative fit tests shall be done for PAPRs which have been put into a motor/blower failure mode.
- G. Respirator Fit Check: The Competent Person shall assure that the positive/negative pressure user seal check is done each time the respirator is donned by an employee. Head coverings must cover respirator head straps. Any situation that prevents an effective facepiece to face seal as evidenced by failure of a user seal check shall preclude that person from entering the regulated area until resolution of the problem.
- H. Maintenance and Care of Respirators: The Respiratory Protection Program Coordinator shall submit evidence and documentation showing compliance with 29 CFR 1910.134 (h) Maintenance and Care of Respirators.
- I. Supplied Air Systems: If a supplied air system is used, the system shall meet all requirements of 29 CFR 1910.134 and the ANSI/Compressed Gas Association (CGA) Commodity Specification for Air current requirements for Type 1 - Grade D breathing air. Low pressure systems are not allowed to be used on asbestos abatement projects. Supplied Air respirator use shall be in accordance with EPA/NIOSH publication EPA-560-OPTS-86-001 "A Guide to Respiratory Protection for the Asbestos Abatement Industry". The competent person on site will be responsible for the supplied air system to ensure the safety of the worker.

1.8 WORKER PROTECTION

- A. Training of Abatement Personnel: Prior to beginning any abatement activity, all personnel shall be trained in accordance with OSHA 29 CFR 1926.1101 (k) (9) and any additional State/Local requirements. Training must include, at a minimum, the elements listed at 29 CFR 1926.1101 (k) (9) (viii). Training shall have been conducted by a third party, EPA/State approved trainer meeting the requirements of EPA 40 CFR 763 Appendix C (AHERA MAP). Initial training certificates and current refresher and accreditation proof must be submitted for each person working at the site.
- B. Medical Examinations: Medical examinations meeting the requirements of 29 CFR 1926.1101 (m) shall be provided for all personnel working in the regulated area, regardless of exposure levels. A current physician's written opinion as required by 29 CFR 1926.1101 (m) (4) shall be provided for each person and shall include in the medical opinion that the person has been evaluated for working in a heat and cold stress environment while wearing personal protective equipment (PPE) and is able to perform the work without risk of material health impairment.
- C. Regulated Area Entry Procedure: The Competent Person shall ensure that each time workers enter the regulated area; they remove ALL street clothes in the clean room of the decontamination unit and put on new disposable coveralls, head coverings, a clean respirator, and then proceed through the shower room to the equipment room where they put on non-disposable required personal protective equipment.
- D. Decontamination Procedure: The Competent Person shall require all personnel to adhere to following decontamination procedures whenever they leave the regulated area.
1. When exiting the regulated area, remove disposable coveralls, and ALL other clothes, disposable head coverings, and foot coverings or boots in the equipment room.
 2. Still wearing the respirator and completely naked, proceed to the shower. Showering is MANDATORY. Care must be taken to follow reasonable procedures in removing the respirator to avoid inhaling asbestos fibers while showering. The following procedure is required as a minimum:
 - a. Thoroughly wet body including hair and face. If using a PAPR hold blower above head to keep filters dry.

- b. With respirator still in place, thoroughly decontaminate body, hair, respirator face piece, and all other parts of the respirator except the blower and battery pack on a PAPR. Pay particular attention to cleaning the seal between the face and respirator facepiece and under the respirator straps.
 - c. Take a deep breath, hold it and/or exhale slowly, completely wetting hair, face, and respirator. While still holding breath, remove the respirator and hold it away from the face before starting to breathe.
3. Carefully decontaminate the facepiece of the respirator inside and out. If using a PAPR, shut down using the following sequence: a) first cap inlets to filters; b) turn blower off to keep debris collected on the inlet side of the filter from dislodging and contaminating the outside of the unit; c) thoroughly decontaminate blower and hoses; d) carefully decontaminate battery pack with a wet rag being cautious of getting water in the battery pack thus preventing destruction. **(THIS PROCEDURE IS NOT A SUBSTITUTE FOR RESPIRATOR CLEANING!)**
 4. Shower and wash body completely with soap and water. Rinse thoroughly.
 5. Rinse shower room walls and floor to drain prior to exiting.
 6. Proceed from shower to clean room; dry off and change into street clothes or into new disposable work clothing.
- E. Regulated Area Requirements: The Competent Person shall meet all requirements of 29 CFR 1926.1101 (o) and assure that all requirements for regulated areas at 29 CFR 1926.1101 (e) are met. All personnel in the regulated area shall not be allowed to eat, drink, smoke, chew tobacco or gum, apply cosmetics, or in any way interfere with the fit of their respirator.

1.9 DECONTAMINATION FACILITIES

- A. Description: Provide each regulated area with separate personnel decontamination facilities (PDF) and waste/equipment decontamination facilities (W/EDF). Ensure that the PDF are the only means of ingress and egress to the regulated area and that all equipment, bagged waste, and other material exit the regulated area only through the W/EDF.
- B. General Requirements: All personnel entering or exiting a regulated area must go through the PDF and shall follow the requirements at 29

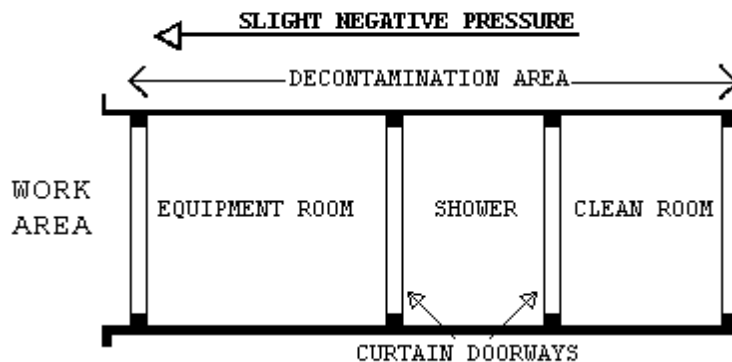
CFR 1926.1101 (j) (1) and these specifications. All waste, equipment and contaminated materials must exit the regulated area through the W/EDF and be decontaminated in accordance with these specifications. Walls and ceilings of the PDF and W/EDF must be constructed of a minimum of 3 layers of 6-mil opaque fire retardant polyethylene sheeting and be securely attached to existing building components and/or an adequate temporary framework. A minimum of 3 layers of 6-mil poly shall also be used to cover the floor under the PDF and W/EDF units. Construct doors so that they overlap and secure to adjacent surfaces. Weight inner doorway sheets with layers of duct tape or approved equivalent so that they close quickly after release. Put arrows on sheets so they show direction of travel and overlap. If the building adjacent area is occupied, construct a solid barrier on the occupied side(s) to protect the sheeting and reduce potential for non-authorized personnel entering the regulated area.

- C. Temporary Facilities to the PDF and W/EDF: The Competent Person shall provide temporary water service connections to the PDF and W/EDF. Backflow prevention must be provided at the point of connection to the VA system. Water supply must be of adequate pressure and meet requirements of 29 CFR 1910.141(d) (3). Provide adequate temporary overhead electric power with ground fault circuit interruption (GFCI) protection. Provide a sub-panel equipped with GFCI protection for all temporary power in the clean room. Provide adequate lighting to provide a minimum of 50 foot candles in the PDF and W/EDF. Provide temporary heat, if needed, to maintain 70 degrees F throughout the PDF and W/EDF.
- D. Personnel Decontamination Facility (PDF): The Competent Person shall provide a PDF consisting of shower room which is contiguous to a clean room and equipment room which is connected to the regulated area. The PDF must be sized to accommodate the number of personnel scheduled for the project. The shower room, located in the center of the PDF, shall be fitted with as many portable showers as necessary to insure all employees can complete the entire decontamination procedure within 15 minutes. The PDF shall be constructed of opaque poly for privacy. The PDF shall be constructed to eliminate any parallel routes of egress without showering.
 - 1. Clean Room: The clean room must be physically and visually separated from the rest of the building to protect the privacy of

personnel changing clothes. The clean room shall be constructed of at least 3 layers of 6-mil opaque fire retardant poly to provide an air tight room. Provide a minimum of 3 foot wide 6-mil poly opaque fire retardant doorways. One doorway shall be the entry from outside the PDF and the second doorway shall be to the shower room of the PDF. The floor of the clean room shall be maintained in a clean, dry and sanitary condition. Shower overflow shall not be allowed into the clean room. Provide 1 storage locker per person. A portable fire extinguisher, minimum 10 pounds capacity, Type ABC, shall be provided in accordance with OSHA and NFPA Standard 10. All persons entering the regulated area shall remove all street clothing in the clean room and dress in disposable protective clothing and respiratory protection. Any person entering the clean room does so either from the outside with street clothing on or is coming from the shower room completely naked and thoroughly washed. Male/Females required to enter the regulated area shall be ensured of their privacy throughout the entry/exit process by posting guards at both entry points to the PDF so no male/female can enter or exit the PDF during his/her stay in the PDF.

2. Shower Room: The Competent Person shall assure that the shower room is a completely water tight compartment to be used for the movement of all personnel from the clean room to the equipment room and for the showering of all personnel going from the equipment room to the clean room. Each shower shall be constructed so water runs down the walls of the shower and into a drip pan. Install a freely draining smooth floor on top of the shower pan. The shower room shall be separated from the rest of the building and from the clean room and equipment room using air tight walls made from at least 3 layers of 6-mil opaque fire retardant poly. The shower shall be equipped with a shower head and controls, hot and cold water, drainage, soap dish and continuous supply of soap, and shall be maintained in a sanitary condition throughout its use. The controls shall be arranged so an individual can shower without assistance. Provide a flexible hose shower head, hose bibs and all other items shown on Shower Schematic. Waste water will be pumped to a drain after being filtered through a minimum of a 100 micron sock in the shower drain; a 20 micron filter; and a final 5 micron filter. Filters will be

- changed a minimum of daily or more often as needed. Filter changes must be done in the shower to prevent loss of contaminated water. Hose down all shower surfaces after each shift and clean any debris from the shower pan. Residue is to be disposed of as asbestos waste.
3. Equipment Room: The Competent Person shall provide an equipment room which shall be an air tight compartment for the storage of work equipment/tools, reusable personal protective equipment, except for a respirator and for use as a gross decontamination area for personnel exiting the regulated area. The Competent Person shall ensure that most gross contamination is removed from the outside of PPE, suits and respirators in the regulated work area, prior to entering the Equipment Room. The equipment room shall be separated from the regulated area by a minimum 3 foot wide door made with 2 layers of 6-mil opaque fire retardant poly. The equipment room shall be separated from the regulated area, the shower room and the rest of the building by air tight walls and ceiling constructed of a minimum of 3 layers of 6-mil opaque fire retardant poly. Damp wipe all surfaces of the equipment room after each shift change. Provide an additional loose layer of 6-mil fire retardant poly per shift change and remove this layer after each shift. If needed, provide a temporary electrical sub-panel equipped with GFCI in the equipment room to accommodate any equipment required in the regulated area.
4. The PDF shall be as follows: Clean room at the entrance followed by a shower room followed by an equipment room leading to the regulated area. Each doorway in the PDF shall be a minimum of 2 layers of 6-mil opaque fire retardant poly.

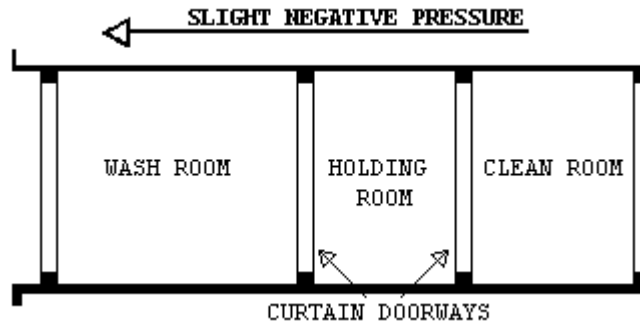


E. Waste/Equipment Decontamination Facility (W/EDF):

1. The Competent Person shall provide a W/EDF consisting of a wash room, holding room, and clean room for removal of waste, equipment and contaminated material from the regulated area. Personnel shall not enter or exit the W/EDF except in the event of an emergency. Clean debris and residue in the W/EDF daily. All surfaces in the W/EDF shall be wiped/hosed down after each shift and all debris shall be cleaned from the shower pan. The W/EDF shall consist of the following:
 - a. Wash Down Station: Provide an enclosed shower unit in the regulated area just outside the Wash Room as an equipment bag and container cleaning station.
 - b. Wash Room: Provide a wash room for cleaning of bagged or containerized asbestos containing waste materials passed from the regulated area. Construct the wash room using 2 inches x 4 inches wood framing or approved equivalent and 3 layers of 6-mil fire retardant poly. Locate the wash room so that packaged materials, after being wiped clean, can be passed to the Holding Room. Doorways in the wash room shall be constructed of 2 layers of 6-mil fire retardant poly.
 - c. Holding Room: Provide a holding room as a drop location for bagged materials passed from the wash room. Construct the holding room using 2 inches x 4 inches wood framing or approved equivalent and 3 layers of 6-mil fire retardant poly. The holding room shall be located so that bagged material cannot be passed from the wash room to the clean room unless it goes through the holding room. Doorways in the holding room shall be constructed of 2 layers of 6-mil fire retardant poly.
 - d. Clean Room: Provide a clean room to isolate the holding room from the exterior of the regulated area. Construct the clean room using 2 inches x 4 inches wood framing or approved equivalent and 2 layers of 6-mil fire retardant poly. The clean room shall be located so as to provide access to the holding room from the building exterior. Doorways to the clean room shall be constructed of 2 layers of 6-mil fire retardant poly. When a negative pressure differential system is used, a rigid enclosure

separation between the W/EDF clean room and the adjacent areas shall be provided.

- e. The W/EDF shall be as follows: Wash Room leading to a Holding Room followed by a Clean Room leading to outside the regulated area. See diagram.



F. Waste/Equipment Decontamination Procedures: At the washdown station in the regulated area, thoroughly wet clean contaminated equipment and/or sealed polyethylene bags and pass into Wash Room after visual inspection. When passing anything into the Wash Room, close all doorways of the W/EDF, other than the doorway between the washdown station and the Wash Room. Keep all outside personnel clear of the W/EDF. Once inside the Wash Room, wet clean the equipment and/or bags. After cleaning and inspection, pass items into the Holding Room. Close all doorways except the doorway between the Holding Room and the Clean Room. Workers from the Clean Room/Exterior shall enter the Holding Room and remove the decontaminated/cleaned equipment/bags for removal and disposal. At no time shall personnel from the clean side be allowed to enter the Wash Room.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. General Requirements: Prior to the start of work, the contractor shall provide and maintain a sufficient quantity of materials and equipment to assure continuous and efficient work throughout the duration of the project. Work shall not start unless the following items have been delivered to the site and the CPIH/CIH has submitted verification to the VA's representative.

1. All materials shall be delivered in their original package, container or bundle bearing the name of the manufacturer and the brand name (where applicable).
2. Store all materials subject to damage off the ground, away from wet or damp surfaces and under cover sufficient enough to prevent damage or contamination. Flammable and combustible materials cannot be stored inside buildings. Replacement materials shall be stored outside of the regulated area until abatement is completed.
3. The Contractor shall not block or hinder use of buildings by patients, staff, and visitors to the VA in partially occupied buildings by placing materials/equipment in any unauthorized location.
4. The Competent Person shall inspect for damaged, deteriorating or previously used materials. Such materials shall not be used and shall be removed from the worksite and disposed of properly.
5. Polyethylene sheeting for walls in the regulated area shall be a minimum of 4-mils. For floors and all other uses, sheeting of at least 6-mil shall be used in widths selected to minimize the frequency of joints. Fire retardant poly shall be used throughout.
6. The method of attaching polyethylene sheeting shall be agreed upon in advance by the Contractor and the VA and selected to minimize damage to equipment and surfaces. Method of attachment may include any combination of moisture resistant duct tape, poly tape, furring strips, spray glue, staples, nails, screws, lumber and plywood for enclosures or approved equivalent procedures capable of sealing polyethylene to dissimilar finished or unfinished surfaces under both wet and dry conditions.
7. Polyethylene sheeting utilized for the PDF shall be opaque white or black in color, 6-mil fire retardant poly.
8. Installation and plumbing hardware, showers, hoses, drain pans, sump pumps and waste water filtration system shall be provided by the Contractor.
9. An adequate number of HEPA vacuums, scrapers, sprayers, nylon brushes, brooms, disposable mops, rags, sponges, staple guns, shovels, ladders and scaffolding of suitable height and length as well as meeting OSHA requirements, fall protection devices, water hose to reach all areas in the regulated area, airless spray

- equipment, and any other tools, materials or equipment required to conduct the abatement project. All electrically operated hand tools, equipment, electric cords shall be connected to GFCI protection.
10. Special protection for objects in the regulated area shall be detailed (e.g., plywood over carpeting or hardwood floors to prevent damage from scaffolds, water and falling material).
 11. Disposal bags - 2 layers of 6-mil poly for asbestos waste shall be pre-printed with labels, markings and address as required by OSHA, EPA and DOT regulations.
 12. The VA shall be provided an advance copy of the Safety Data Sheets (SDS) as required for all hazardous chemicals under OSHA 29 CFR 1910.1200 - Hazard Communication in the pre-start meeting submittal. Chlorinated compounds shall not be used with any spray adhesive, mastic remover or other product. Appropriate encapsulant(s) shall be provided.
 13. OSHA DANGER demarcation signs, as many and as required by OSHA 29 CFR 1926.1101(k) (7) shall be provided and placed by the Competent Person. All other posters and notices required by Federal and State regulations shall be posted in the Clean Room.
 14. Adequate and appropriate PPE for the project and number of personnel/shifts shall be provided. All personal protective equipment issued must be based on a written hazard assessment conducted under 29 CFR 1910.132(d).

2.2 MONITORING, INSPECTION AND TESTING

A. General:

1. Perform throughout abatement work monitoring, inspection and testing inside and around the regulated area in accordance with the OSHA requirements and these specifications. OSHA requires that the employee exposure to asbestos must not exceed 0.1 fiber per cubic centimeter (f/cc) of air, averaged over an 8-hour work shift. The CPIH/CIH is responsible for and shall inspect and oversee the performance of the Contractor IH Technician. The IH Technician shall continuously inspect and monitor conditions inside the regulated area to ensure compliance with these specifications. In addition, the CPIH/CIH shall personally manage air sample collection, analysis, and evaluation for personnel, regulated area, and adjacent area samples inside the building, but outside the regulated area.

Inside the building, but outside the regulated area air samples shall be collected in the Clean Room of the PDF, at the approximate location of HEPA exhaust discharge, and at a minimum of three (3) locations in areas immediately outside the regulated work area to satisfy this specification. Additional inspection and testing requirements are also indicated in other parts of this specification.

2. The VA will employ an independent industrial hygienist (VPIH/CIH) consultant and/or use its own IH to perform various services on behalf of the VA. The VPIH/CIH will perform the necessary monitoring, inspection, testing, and other support services to ensure that VA patients, employees, and visitors will not be adversely affected by the abatement work, and that the abatement work proceeds in accordance with these specifications, that the abated areas or abated buildings have been successfully decontaminated. The work of the VPIH/CIH consultant in no way relieves the Contractor from their responsibility to perform the work in accordance with contract/specification requirements, to perform continuous inspection, monitoring and testing for the safety of their employees, and to perform other such services as specified. The cost of the VPIH/CIH and their services will be borne by the VA except for any repeat of final inspection and testing that may be required due to unsatisfactory initial results. Any repeated final inspections and/or testing, if required, will be paid for by the Contractor.
3. If fibers counted by the VPIH/CIH during abatement work, either inside or outside the regulated area, utilizing the NIOSH 7400 air monitoring method, exceed the specified respective limits, the Contractor shall stop work. The Contractor may request confirmation of the results by analysis of the samples by TEM. Request must be in writing and submitted to the VA's representative. Cost for the confirmation of results will be borne by the Contractor for both the collection and analysis of samples and for the time delay that may/does result for this confirmation. Confirmation sampling and analysis will be the responsibility of the CPIH/CIH with review and approval of the VPIH/CIH. An agreement between the CPIH/CIH and the VPIH/CIH shall be reached on the exact details of the confirmation

effort, in writing, including such things as the number of samples, location, collection, quality control on-site, analytical laboratory, interpretation of results and any follow-up actions. This written agreement shall be co-signed by the IH's and delivered to the VA's representative.

B. Scope of Services of the VPIH/CIH Consultant:

1. The purpose of the work of the VPIH/CIH is to: assure quality; adherence to the specification; resolve problems; prevent the spread of contamination beyond the regulated area; and assure clearance at the end of the project. In addition, their work includes performing the final inspection and testing to determine whether the regulated area or building has been adequately decontaminated. All air monitoring is to be done utilizing PCM/TEM. The VPIH/CIH will perform the following tasks:
 - a. Task 1: Establish background levels before abatement begins by collecting background samples. Retain samples for possible TEM analysis.
 - b. Task 2: Perform representative air monitoring, inspection, and testing outside the regulated area during actual abatement work to detect any faults in the regulated area isolation and any adverse impact on the surroundings from regulated area activities.
 - c. Task 3: Perform unannounced visits to spot check overall compliance of work with contract/specifications. These visits may include any inspection, monitoring, and testing inside and outside the regulated area and all aspects of the operation except personnel monitoring.
 - d. Task 4: Provide support to the VA representative such as evaluation of submittals from the Contractor, resolution of conflicts, interpret data, etc.
 - e. Task 5: Perform, in the presence of the VA representative, final inspection and testing of a decontaminated regulated area at the conclusion of the abatement to certify compliance with all regulations and VA requirements/specifications.
 - f. Task 6: Issue certificate of decontamination for each regulated area and project report.

2. All documentation, inspection results and testing results generated by the VPIH/CIH will be available to the Contractor for information and consideration. The Contractor shall cooperate with and support the VPIH/CIH for efficient and smooth performance of their work.
 3. The monitoring and inspection results of the VPIH/CIH will be used by the VA to issue any Stop Removal orders to the Contractor during abatement work and to accept or reject a regulated area or building as decontaminated.
- C. Monitoring, Inspection and Testing by Contractor CPIH/CIH: The Contractor's CPIH/CIH is responsible for managing all monitoring, inspections, and testing required by these specifications, as well as any and all regulatory requirements adopted by these specifications. The CPIH/CIH is responsible for the continuous monitoring of all subsystems and procedures which could affect the health and safety of the Contractor's personnel. Safety and health conditions and the provision of those conditions inside the regulated area for all persons entering the regulated area is the exclusive responsibility of the Contractor/Competent Person. The person performing the personnel and area air monitoring inside the regulated area shall be an IH Technician, who shall be trained and shall have specialized field experience in sampling and analysis. The IH Technician shall have successfully completed a NIOSH 582 Course or equivalent and provide documentation. The IH Technician shall participate in the AIHA Asbestos Analysis Registry or participate in the Proficiency Analytical Testing program of AIHA for fiber counting quality control assurance. The IH Technician shall also be an accredited EPA AHERA/State Contractor/Supervisor and Building Inspector. The IH Technician shall have participated in five abatement projects collecting personal and area samples and have experience in substantially similar projects in size and scope. The analytical laboratory used by the Contractor to analyze the samples shall be AIHA accredited for asbestos PAT and approved by the VA prior to start of the project. A daily log shall be maintained by the CPIH/CIH or IH Technician, documenting all OSHA requirements for personal and area air monitoring for asbestos in 29 CFR 1926.1101(f), (g) and Appendix A. This log shall be made available to the VA representative and the VPIH/CIH upon request. The log will contain, at a minimum, information on personnel or area samples, other

persons represented by the sample, the date of sample collection, start and stop times for sampling, sample volume, flow rate, and fibers/cc. The CPIH/CIH shall collect and analyze samples for each representative job being done in the regulated area, i.e., removal, wetting, clean-up, and load-out. No fewer than two (2) personal air samples or 25 percent of representative workforce per shift shall be collected, whichever is greater, in the regulated area; a minimum of three (3) area air samples at locations inside the building but immediately outside the regulated work area; one (1) area air sample shall be collected daily in the Clean Room of the PDF; and one (1) area air sample shall be collected daily at the approximate location of HEPA exhaust discharge. In addition to the continuous monitoring required, the CPIH/CIH will perform inspection and testing at the final stages of abatement for each regulated area as specified in the CPIH/CIH responsibilities. Additionally, the CPIH/CIH will monitor and record pressure readings within the containment daily with a minimum of two readings at the beginning and at the end of a shift, and submit the data in the daily report.

2.3 ASBESTOS HAZARD ABATEMENT PLAN

A. The Contractor shall have an established an Asbestos Hazard Abatement Plan (AHAP) in printed form and loose leaf folder consisting of simplified text, diagrams, sketches, and pictures that establish and explain clearly the procedures to be followed during all phases of the work by the Contractor's personnel. The AHAP must be modified as needed to address specific requirements of this project and the specifications. The AHAP shall be submitted for review and approval to the VA prior to the start of any abatement work. The minimum topics and areas to be covered by the AHAPs are:

1. Minimum Personnel Qualifications
2. Emergency Action Plan/Contingency Plans and Arrangements
3. Security and Safety Procedures
4. Respiratory Protection/Personal Protective Equipment Program and Training
5. Medical Surveillance Program and Recordkeeping
6. Regulated Area Requirements - Containment Barriers/Isolation of Regulated Area
7. Decontamination Facilities and Entry/Exit Procedures (PDF and W/EDF)

8. Negative Pressure Systems Requirements
9. Monitoring, Inspections, and Testing
10. Removal Procedures for ACM
11. Removal of Contaminated Soil (if applicable)
12. Encapsulation Procedures for ACM
13. Disposal of ACM waste/equipment
14. Regulated Area Decontamination/Clean-up
15. Regulated Area Visual and Air Clearance
16. Project Completion/Closeout

2.4 SUBMITTALS

A. Pre-Start Meeting Submittals:

1. Submit to the VA a minimum of 14 days prior to the pre-start meeting the following for review and approval. Meeting this requirement is a prerequisite for the pre-start meeting for this project:
 - a. Submit a detailed work schedule for the entire project reflecting contract documents and the phasing/schedule requirements from the CPM chart.
 - b. Submit a staff organization chart showing all personnel who will be working on the project and their capacity/function. Provide their qualifications, training, accreditations, and licenses, as appropriate. Provide a copy of the "Certificate of Worker's Acknowledgment" and the "Affidavit of Medical Surveillance and Respiratory Protection" for each person.
 - c. Submit Asbestos Hazard Abatement Plan developed specifically for this project, incorporating the requirements of the specifications, prepared, signed and dated by the CPIH/CIH.
 - d. Submit the specifics of the materials and equipment to be used for this project with manufacturer names, model numbers, performance characteristics, pictures/diagrams, and number available for the following:
 - 1) Supplied air system, negative air machines, HEPA vacuums, air monitoring pumps, calibration devices, pressure differential monitoring device and emergency power generating system.
 - 2) Waste water filtration system, shower system, containment barriers.
 - 3) Encapsulants, surfactants, hand held sprayers, airless sprayers, glovebags, and fire extinguishers.

- 4) Sealants/caulks to be utilized as temporary controls following completion of abatement.
- 5) Respirators, protective clothing, fall protection and other required personal protective equipment.
- 6) Fire safety equipment to be used in the regulated area.
- e. Submit the name, location, and phone number of the approved landfill; proof/verification the landfill is approved for ACM disposal; the landfill's requirements for ACM waste; the type of vehicle to be used for transportation; and name, address, and phone number of subcontractor, if used. Proof of asbestos training for transportation personnel shall be provided.
- f. Submit required notifications and arrangements made with regulatory agencies having regulatory jurisdiction and the specific contingency/emergency arrangements made with local health, fire, ambulance, hospital authorities and any other notifications/arrangements.
- g. Submit the name, location and verification of the laboratory and/or personnel to be used for analysis of air and/or bulk samples. Personal air monitoring must be done in accordance with OSHA 29 CFR 1926.1101(f) and Appendix A. Area or clearance air monitoring shall be conducted in accordance with EPA AHERA protocols.
- h. Submit qualifications verification: Submit the following evidence of qualifications. Make sure that all references are current and verifiable by providing current phone numbers and documentation.
 - 1) Asbestos Abatement Company: Project experience within the past 3 years; listing projects first most similar to this project: Project Name; Type of Abatement; Duration; Cost; Reference Name/Phone Number; Final Clearance; Completion Date
 - 2) List of project(s) halted by owner, A/E, IH, regulatory agency in the last 3 years: Project Name; Reason; Date; Reference Name/Number; Resolution
 - 3) List asbestos regulatory citations (e.g., OSHA), notices of violations (e.g., Federal and state EPA), penalties, and legal actions taken against the company including the company's officers (including damages paid) in the last 3

years. Provide copies and all information needed for verification.

- i. Submit information on personnel: Provide a resume; address each item completely; copies of certificates, accreditations, and licenses. Submit an affidavit signed by the CPIH/CIH stating that all personnel submitted below have medical records in accordance with OSHA 29 CFR 1926.1101(m) and that the company has implemented a medical surveillance program and written respiratory protection program, and maintains recordkeeping in accordance with the above regulation. Submit the phone number and doctor/clinic/hospital used for medical evaluations.
 - 1) CPIH/CIH and IH Technician: Name; years of abatement experience; list of projects similar to this one; certificates, licenses, accreditations for proof of AHERA/OSHA specialized asbestos training; professional affiliations; medical opinion; and current respirator fit test.
 - 2) Competent Person(s)/Supervisor(s): Number; names; last four digits of social security numbers; years of abatement experience as Competent Person/Supervisor; list of similar projects in size/complexity as Competent Person/Supervisor; as a worker; certificates, licenses, accreditations; proof of AHERA/OSHA specialized asbestos training; maximum number of personnel supervised on a project; medical opinion (asbestos surveillance and respirator use); and current respirator fit test.
 - 3) Workers: Numbers; names; last four digits of social security numbers; years of abatement experience; certificates, licenses, accreditations; training courses in asbestos abatement and respiratory protection; medical opinion (asbestos surveillance and respirator use); and current respirator fit test.
- j. Submit copies of State license for asbestos abatement; copy of insurance policy, including exclusions with a letter from agent stating in plain language the coverage provided and the fact that asbestos abatement activities are covered by the policy; copy of AHAPs incorporating the requirements of this specification; information on who provides your training, how often; who provides medical surveillance, how often; who performs and how is

personal air monitoring of abatement workers conducted; a list of references of independent laboratories/IH's familiar with your air monitoring and standard operating procedures; and copies of monitoring results of the five referenced projects listed and analytical methods used.

- k. Rented equipment must be decontaminated prior to returning to the rental agency.
- l. Submit, before the start of work, the manufacturer's technical data for all types of encapsulants, all SDS and application instructions.

B. Submittals During Abatement:

- 1. The Competent Person shall maintain and submit a daily log at the regulated area documenting the dates and times of the following: purpose, attendees and summary of meetings; all personnel entering/exiting the regulated area; document and discuss the resolution of unusual events such as barrier breeching, equipment failures, emergencies, and any cause for stopping work; and representative air monitoring and results/TWA's/EL's. Submit this information daily to the VA's representative.
- 2. The CPIH/CIH shall document and maintain the inspection and approval of the regulated area preparation prior to start of work and daily during work.
 - a. Removal of any poly barriers.
 - b. Visual inspection/testing by the CPIH/CIH or IH Technician prior to application of lockdown encapsulant.
 - c. Packaging and removal of ACM waste from regulated area.
 - d. Disposal of ACM waste materials; copies of Waste Shipment Records/landfill receipts to the VA's representative on a weekly basis.

C. Submittals at Completion of Abatement: The CPIH/CIH shall submit a project report consisting of the daily log book requirements and documentation of events during the abatement project including Waste Shipment Records signed by the landfill's agent. It will also include information on the containment and transportation of waste from the containment with applicable Chain of Custody forms. The report shall include a certificate of completion, signed and dated by the CPIH/CIH, in accordance with Attachment #1. All clearance and perimeter area

samples must be submitted. The VA representative will retain the abatement report after completion of the project and provide copies of the abatement report to VAMC Office of Engineer and the Safety Office.

2.5 ENCAPSULANTS

A. Types of Encapsulants:

1. The following four types of encapsulants, if used, must comply with performance requirements as stated in paragraph 2.5.2:
 - a. Removal encapsulant - used as a wetting agent to remove ACM.
 - b. Bridging encapsulant - provides a tough, durable coating on ACM.
 - c. Penetrating encapsulant - penetrates/encapsulates ACM at least 1/2 inches.
 - d. Lockdown encapsulant - seals microscopic fibers on surfaces after ACM removal.

B. Performance Requirements:

1. Encapsulants shall meet the latest requirements of EPA; shall not contain toxic or hazardous substances; or solvents; and shall comply with the following performance requirements:
 - a. General Requirements for all Encapsulants:
 - 1) ASTM E84: Flame spread of 25; smoke emission of 50.
 - 2) University of Pittsburgh Protocol: Combustion Toxicity; zero mortality.
 - 3) ASTM C732: Accelerated Aging Test; Life Expectancy - 20 years.
 - 4) ASTM E96: Permeability - minimum of 0.4 perms.
 - b. Bridging/Penetrating Encapsulants:
 - 1) ASTM E736: Cohesion/Adhesion Test - 50 pounds/square foot.
 - 2) ASTM E119: Fire Resistance - 3 hours (Classified by UL for use on fibrous/cementitious fireproofing).
 - 3) ASTM D2794: Gardner Impact Test; Impact Resistance - minimum 43 in/lb.
 - 4) ASTM D522: Mandrel Bend Test; Flexibility - no rupture or cracking.
 - c. Lockdown Encapsulants:
 - 1) ASTM E119: Fire resistance - 3 hours (tested with fireproofing over encapsulant applied directly to steel member).
 - 2) ASTM E736: Bond Strength - 100 pounds/square foot (test compatibility with cementitious and fibrous fireproofing).

- 3) In certain situations, encapsulants may have to be applied to hot pipes/equipment. The encapsulant must be able to withstand high temperatures without cracking or creating any noxious gaseous or vapors during or after application.

C. Certificates of Compliance: The Contractor shall submit to the VA representative certification from the manufacturer indicating compliance with performance requirements for encapsulants when applied according to manufacturer recommendations.

PART 3 - EXECUTION

3.1 REGULATED AREA PREPARATIONS

A. Site Security:

1. Regulated area access is to be restricted only to authorized, trained/accredited and protected personnel. These may include the Contractor's employees, employees of Subcontractors, VA employees and representatives, State and Local inspectors, and any other designated individuals. A list of authorized personnel shall be established prior to commencing the project and be posted in the clean room of the decontamination unit.
2. Entry into the regulated area by unauthorized individuals shall be reported immediately to the Competent Person by anyone observing the entry. The Competent Person shall immediately require any unauthorized person to leave the regulated area and then notify the VA Contracting Officer or VA Representative using the most expeditious means.
3. A log book shall be maintained in the clean room of the decontamination unit. Anyone who enters the regulated area must record their name, affiliation, time in, and time out for each entry.
4. Access to the regulated area shall be through a single decontamination unit. All other access (doors, windows, hallways, etc.) shall be sealed and demarcated as an asbestos regulated work area to prevent entry to or exit from the regulated area unless in the event of an emergency. The only exceptions for this requirement are the waste/equipment load-out area which shall be sealed except during the removal of containerized asbestos waste from the regulated area, and emergency exits. Emergency exits shall not be locked from the inside; however, they shall be sealed with poly

sheeting and taped until needed. In any situation where exposure to high temperatures which may result in a flame hazard, fire retardant poly sheeting must be used.

5. The Contractor's Competent Person shall control site security during abatement operations in order to isolate work in progress and protect adjacent personnel. A 24-hour security system shall be provided at the entrance to the regulated area to assure that all entrants are logged in/out and that only authorized personnel are allowed entrance.
6. The Contractor will have the VA's assistance in notifying adjacent personnel of the presence, location and quantity of ACM in the regulated area and enforcement of restricted access by the VA's employees.
7. The regulated area shall be locked during non-working hours and secured by VA Representative or Competent Person. The VA Police shall be informed of asbestos abatement regulated areas to provide security checks during facility rounds and emergency response.

B. Signage and Power Management:

1. Post OSHA DANGER signs meeting the specifications of OSHA 29 CFR 1926.1101 at any location and approaches to the regulated area. Signs shall be posted at a distance sufficiently far enough away from the regulated area to permit any personnel to read the sign and take the necessary measures to avoid exposure. Additional signs will be posted following construction of the regulated area enclosure.
2. Shut down and lock out/tag out electric power to the regulated area. Provide temporary power and lighting. Insure safe installation including GFCI of temporary power sources and equipment by compliance with all applicable electrical code and OSHA requirements for temporary electrical systems. Electricity shall be provided by the VA.
3. Shut down and lock out/tag out heating, cooling, and air conditioning system (HVAC) components that are in, supply or pass through the regulated area. Investigate the regulated area and agree on pre-abatement condition with the VA's representative. Seal all intake and exhaust vents in the regulated area with duct tape and 2 layers of independently installed 6-mil poly. Also, seal any seams in system components that pass through the regulated area. Remove

all contaminated HVAC system filters and place in labeled 6-mil polyethylene disposal bags for staging and eventual disposal as asbestos waste.

C. Negative Pressure Filtration System:

1. The Contractor shall provide enough HEPA negative air machines to effect $\geq - 0.02$ inch WCG pressure differential inside the regulated work area. The Competent Person shall determine the number of units needed for the regulated area by dividing the cubic feet in the regulated area by 15 and then dividing that result by the cubic feet per minute (CFM) for each unit to determine the number of units needed to effect $\geq - 0.02$ inch WCG pressure inside the regulated work area. Provide standby units in the event of machine failure and/or emergency in an adjacent area. HEPA equipped negative air machines shall be discharged outside of the building a minimum of 30 feet from building make-up air, doors, open windows, patients, visitors and staff.
2. NIOSH has done extensive studies and has determined that negative air machines typically operate at ~50 percent efficiency. The contractor shall consider this in their determination of number of units needed to provide $\geq - 0.02$ inch WCG pressure differential inside the regulated work area. The contractor shall use double the number of machines, based on their calculations, or submit proof their machines operate at stated capacities, at a 2 inches pressure drop across the filters.
3. Design and Layout:
 - a. Before start of work submit the design and layout of the regulated area and the negative air machines. The submittal shall indicate the number of, location of and size of negative air machines. The point(s) of exhaust, air flow within the regulated area, anticipated negative pressure differential, and supporting calculations for sizing shall be provided. In addition, submit the following:
 - 1) Method of supplying power to the units and designation/location of the panels.
 - 2) Description of testing method(s) for correct air volume and pressure differential.

3) If auxiliary power supply is to be provided for the negative air machines, provide a schematic diagram of the power supply and manufacturer's data on the generator and switch.

4. Negative Air Machines (Hepa Units):

- a. Negative Air Machine Cabinet: The cabinet shall be constructed of steel or other durable material capable of withstanding potential damage from rough handling and transportation. The width of the cabinet shall be less than 30 inches in order to fit in standard doorways. The cabinet must be factory sealed to prevent asbestos fibers from being released during use, transport, or maintenance. Any access to and replacement of filters shall be from the inlet end. The unit must be on casters or wheels.
- b. Negative Air Machine Fan: The rating capacity of the fan must indicate the CFM under actual operating conditions. Manufacturer's typically use "free-air" (no resistance) conditions when rating fans. The fan must be a centrifugal type fan.
- c. Negative Air Machine Final Filter: The final filter shall be a HEPA filter. The filter media must be completely sealed on all edges within a structurally rigid frame. The filter shall align with a continuous flexible gasket material in the negative air machine housing to form an air tight seal. Each HEPA filter shall be certified by the manufacturer to have an efficiency of not less than 99.97 percent. Testing shall have been done in accordance with Military Standard MIL-STD-282 and Army Instruction Manual 136-300-175A. Each filter must bear a UL586 label to indicate ability to perform under specified conditions. Each filter shall be marked with the name of the manufacturer, serial number, air flow rating, efficiency and resistance, and the direction of test air flow.
- d. Negative Air Machine Pre-filters: The pre-filters, which protect the final HEPA filter by removing larger particles, are required to prolong the operating life of the HEPA filter. Two stages of pre-filtration are required. A first stage pre-filter shall be a low efficiency type for particles 10 µm or larger. A second stage pre-filter shall have a medium efficiency effective for particles down to 5 µm or larger. Pre-filters shall be installed either on

- or in the intake opening of the NAM and the second stage filter must be held in place with a special housing or clamps.
- e. Negative Air Machine Instrumentation: Each unit must be equipped with a gauge to measure the pressure drop across the filters and to indicate when filters have become loaded and need to be changed. A table indicating the cfm for various pressure readings on the gauge shall be affixed near the gauge for reference or the reading shall indicate at what point the filters shall be changed, noting cfm delivery. The unit must have an elapsed time meter to show total hours of operation.
 - f. Negative Air Machine Safety and Warning Devices: An electrical/mechanical lockout must be provided to prevent the fan from being operated without a HEPA filter. Units must be equipped with an automatic shutdown device to stop the fan in the event of a rupture in the HEPA filter or blockage in the discharge of the fan. Warning lights are required to indicate normal operation; too high a pressure drop across filters; or too low of a pressure drop across filters.
 - g. Negative Air Machine Electrical: All electrical components shall be approved by the National Electrical Manufacturer's Association (NEMA) and Underwriters Laboratories (UL). Each unit must be provided with overload protection and the motor, fan, fan housing, and cabinet must be grounded.
 - h. It is essential that replacement HEPA filters be tested using an "in-line" testing method, to ensure the seal around the periphery was not damaged during replacement. Damage to the outer HEPA filter seal could allow contaminated air to bypass the HEPA filter and be discharged to an inappropriate location. Contractor will provide written documentation of test results for negative air machine units with HEPA filters.
5. Pressure Differential: The fully operational negative air system within the regulated area shall continuously maintain a pressure differential $\geq - 0.02$ inch WCG inside the regulated work area. Before any disturbance of any asbestos material, this shall be demonstrated to the VA by use of a pressure differential meter/manometer as required by OSHA 29 CFR 1926.1101(g)(5)(i). The Competent Person shall be responsible for providing, maintaining,

and documenting the negative pressure and air changes as required by OSHA and this specification.

6. Monitoring: The pressure differential shall be continuously monitored and recorded between the regulated area and the area outside the regulated area with a monitoring device that incorporates a strip chart recorder. The strip chart recorder shall become part of the project log and shall indicate at least $\geq - 0.02$ inch WCG pressure differential inside the regulated work area for the duration of the project.
7. Auxiliary Generator: If the building is occupied during abatement, provide an auxiliary gasoline/diesel generator located outside the building in an area protected from the weather. In the event of a power failure of the general power grid and the VAMC emergency power grid, the generator must automatically start and supply power to a minimum of 50 percent of the negative air machines in operation.
8. Supplemental Make-Up Air Inlets: Provide, as needed for proper air flow in the regulated area, in a location approved by the VA, openings in the plastic sheeting to allow outside air to flow into the regulated area. Auxiliary makeup air inlets must be located as far from the negative air machines as possible, off the floor near the ceiling, and away from the barriers that separate the regulated area from the occupied clean areas. Cover the inlets with weighted flaps which will seal in the event of failure of the negative pressure system.
9. Testing The System: The negative pressure system must be tested before any ACM is disturbed in any way. After the regulated area has been completely prepared, the decontamination units set up, and the negative air machines installed, start the units up one at a time. Demonstrate and document the operation and testing of the negative pressure system to the VA using smoke tubes and a negative pressure gauge. Verification and documentation of adequate negative pressure differential across each barrier must be done at the start of each work shift.

10. Demonstration of the Negative Pressure Filtration System:
 - a. The demonstration of the operation of the negative pressure system to the VA shall include, but not be limited to, the following:
 - 1) Plastic barriers and sheeting move lightly in toward the regulated area.
 - 2) Curtains of the decontamination units move in toward regulated area.
 - 3) There is a noticeable movement of air through the decontamination units. Use the smoke tube to demonstrate air movement from the clean room to the shower room to the equipment room to the regulated area.
 - 4) Use smoke tubes to demonstrate air is moving across all areas in which work is to be done. Use a differential pressure gauge to indicate a negative pressure of at $> - 0.02$ inch across every barrier separating the regulated area from the rest of the building. Modify the system as necessary to meet the above requirements.
11. Use of the Negative Pressure Filtration System During Abatement Operations:
 - a. Start units before beginning any disturbance of ACM occurs. After work begins, the units shall run continuously, maintaining 4 actual air changes per hour at a negative pressure differential of $> - 0.02$ inch water column gauge, for the duration of the work until a final visual clearance and final air clearance has been successfully completed.
 - b. No negative air units shall be shut down at any time unless authorized by the VA Contracting Officer, verbally and in writing.
 - c. Pre-cleaning of ACM contaminated items shall be performed after the enclosure has been erected and negative pressure has been established in the work area. After items have been pre-cleaned and decontaminated, they may be removed from the work area for storage until the completion of abatement in the work area.
 - d. Abatement work shall begin at a location farthest from the units and proceed towards them. If an electric failure occurs, the Competent Person shall stop all abatement work and immediately

begin wetting all exposed asbestos materials for the duration of the power outage. Abatement work shall not resume until power is restored and all units are operating properly again.

- e. The negative air machines shall continue to run after all work is completed and until a final visual clearance and a final air clearance has been successfully completed for that regulated area.

- 12. Dismantling The System: After completion of the final visual and final air clearance has been obtained by the VPIH/CIH, the units may be shut down. The unit exterior surfaces shall have been completely decontaminated; pre-filters are not to be removed and the units inlet/outlet sealed with 2 layers of 6-mil poly immediately after shut down. No filter removal shall occur at the VA site following successful completion of site clearance. OSHA/EPA/DOT asbestos labels shall be attached to the units.

D. Containment Barriers and Coverings in the Regulated Area:

- 1. General: Seal off the perimeter to the regulated area to completely isolate the regulated area from adjacent spaces. All surfaces in the regulated area must be covered to prevent contamination and to facilitate clean-up. Should adjacent areas become contaminated as a result of the work, Contractor shall immediately stop work and clean up the contamination at no additional cost to the VA. Abatement contractor shall not disturb areas outside the containment area. Areas surrounding the containment shall be continuously checked to ensure integrity of the containment and the abatement work does not create any disturbances, damage or openings to the containment. Provide firestopping and identify all fire barrier penetrations due to abatement work as specified in Section 3.1.4.8; FIRESTOPPING. Asbestos containment to remain up until VA FM inspects and approved of asbestos abatement work.
- 2. Preparation Prior To Sealing: The Regulated Area: Place all tools, scaffolding, materials and equipment needed for working in the regulated area prior to erecting any plastic sheeting. All uncontaminated removable furniture, equipment and/or supplies shall be removed by the VA from the regulated area before commencing work. Any objects not scheduled for removal remaining in the regulated area shall be completely covered with 2 layers of 6-mil fire

retardant poly sheeting and secured with duct tape. Lock out and tag out any HVAC/electrical systems in the regulated area.

3. Controlling Access to The Regulated Area: Access to the regulated area is allowed only through the personnel decontamination facility (PDF). All other means of access shall be eliminated and OSHA DANGER demarcation signs posted as required by OSHA. If the regulated area is adjacent to, or within view of an occupied area, provide a visual barrier of 6-mil opaque fire retardant poly to prevent building occupant observation. If the adjacent area is accessible to the public, the barrier must be solid and capable of withstanding the negative pressure.
4. Critical Barriers: Completely separate any operations in the regulated area from adjacent areas using 2 layers of 6-mil fire retardant poly and duct tape. Individually seal with 2 layers of 6-mil poly and duct tape all HVAC openings into the regulated area. Individually seal all lighting fixtures, clocks, doors, windows, convectors, speakers, or any other objects/openings in the regulated area. Heat must be shut off any objects covered with poly.
5. Primary Barriers:
 - a. Cover the regulated area with two layers of 6-mil fire retardant poly on the floors and two layers of 4 mil, fire retardant poly on the walls, unless otherwise directed in writing by the VA representative. Floor layers must form a right angle with the wall and turn up the wall at least 12 inches. Seams must overlap at least 6 feet and must be spray glued and taped. Install sheeting so that layers can be removed independently from each other. Carpeting shall be covered with three layers of 6-mil poly. Corrugated cardboard sheets must be placed between the bottom and middle layers of poly. Mechanically support and seal with duct tape and glue all wall layers.
 - b. If stairs and ramps are covered with 6-mil plastic, two layers must be used. Provide 3/4 inch exterior grade plywood treads held in place with duct tape/glue on the plastic. Do not cover rungs or rails with any isolation materials.
6. Secondary Barriers: A loose layer of 6-mil shall be used as a drop cloth to protect the primary layers from debris generated during the abatement. This layer shall be replaced as needed during the work.

7. Extension of the Regulated Area: If the enclosure of the regulated area is breached in any way that could allow contamination to occur, the affected area shall be included in the regulated area and constructed as per this section. Decontamination measures must be started immediately and continue until air monitoring indicates background levels are met.
8. Firestopping:
 - a. Through penetrations caused by cables, cable trays, pipes, sleeves, conduits, etc. must be firestopped with a fire-rated firestop system providing an air tight seal.
 - b. Firestop materials that are not equal to the wall or ceiling penetrated shall be brought to the attention of the VA Representative. The contractor shall list all areas of penetration, the type of sealant used, and whether or not the location is fire rated. Any discovery of penetrations during abatement shall be brought to the attention of the VA representative immediately. All walls, floors and ceilings are considered fire rated unless otherwise determined by the VA Representative or Fire Marshall.
 - c. Any visible openings whether or not caused by a penetration shall be reported by the Contractor to the VA Representative for a sealant system determination. Firestops shall meet ASTM E814 and UL 1479 requirements for the opening size, penetrant, and fire rating needed.
- E. Sanitary Facilities: The Contractor shall provide sanitary facilities for abatement personnel and maintain them in a clean and sanitary condition throughout the abatement project.
- F. Personal Protective Equipment: Provide whole body clothing, head coverings, gloves and foot coverings and any other personal protective equipment as determined by conducting the hazard assessment required by OSHA at 29 CFR 1910.132 (d). The Competent Person shall ensure the integrity of personal protective equipment worn for the duration of the project. Duct tape shall be used to secure all suit sleeves to wrists and to secure foot coverings at the ankle.

G. Pre-Cleaning:

1. The VA will provide water for abatement purposes. The Contractor shall connect to the existing VA system. The service to the shower(s) shall be supplied with backflow prevention.
2. Pre-cleaning of ACM contaminated items shall be performed after the enclosure has been erected and negative pressure has been established in the work area. All workers performing pre-cleaning activities must don appropriate personal protective equipment (PPE), as specified throughout this document and as approved in the Contractor's work plan. After items have been pre-cleaned and decontaminated, they may be removed from the work area for storage until the completion of abatement in the work area.
3. Pre-clean all movable objects within the regulated area using a HEPA filtered vacuum and/or wet cleaning methods as appropriate. After cleaning, these objects shall be removed from the regulated area and carefully stored in an uncontaminated location. Drapes, clothing, upholstered furniture and other fabric items shall be disposed of as asbestos contaminated waste. Cleaning these asbestos contaminated items utilizing HEPA vacuum techniques and off-premises steam cleaning is very difficult and cannot guarantee decontamination. Carpeting will be disposed of prior to abatement if in the regulated area. If ACM floor tile is attached to the carpet while the Contractor is removing the carpet that section of the carpet will be disposed of as asbestos waste.
4. Pre-clean all fixed objects in the regulated area using HEPA filtered vacuums and/or wet cleaning techniques as appropriate. Careful attention must be paid to machinery behind grills or gratings where access may be difficult but contamination may be significant. Also, pay particular attention to wall, floor and ceiling penetration behind fixed items. After pre-cleaning, enclose fixed objects with 2 layers of 6-mil poly and seal securely in place with duct tape. Objects (e.g., permanent fixtures, shelves, electronic equipment, laboratory tables, sprinklers, alarm systems, closed circuit TV equipment and computer cables) which must remain in the regulated area and that require special ventilation or enclosure requirements should be designated here along with

specified means of protection. Contact the manufacturer for special protection requirements.

5. Pre-clean all surfaces in the regulated area using HEPA filtered vacuums and/or wet cleaning methods as appropriate. Do not use any methods that would raise dust such as dry sweeping or vacuuming with equipment not equipped with HEPA filters. Do not disturb asbestos-containing materials during this pre-cleaning phase.

H. Pre-Abatement Activities:

1. Pre-Abatement Meeting: The VA representative, upon receipt, review, and substantial approval of all pre-abatement submittals and verification by the CPIH/CIH that all materials and equipment required for the project are on the site, will arrange for a pre-abatement meeting between the Contractor, the CPIH/CIH, Competent Person(s), the VA representative(s), and the VPIH/CIH. The purpose of the meeting is to discuss any aspect of the submittals needing clarification or amplification and to discuss any aspect of the project execution and the sequence of the operation. The Contractor shall be prepared to provide any supplemental information/documentation to the VA's representative regarding any submittals, documentation, materials or equipment. Upon satisfactory resolution of any outstanding issues, the VA's representative will issue a written order to proceed to the Contractor. No abatement work of any kind described in the following provisions shall be initiated prior to the VA written order to proceed.
2. Pre-Abatement Construction and Operations:
 - a. Perform all preparatory work for the first regulated area in accordance with the approved work schedule and with this specification.
 - b. Upon completion of all preparatory work, the CPIH/CIH will inspect the work and systems and will notify the VA's representative when the work is completed in accordance with this specification. The VA's representative may inspect the regulated area and the systems with the VPIH/CIH and may require that upon satisfactory inspection, the Contractor's employees perform all major aspects of the approved AHAP(s), especially worker protection, respiratory systems, contingency plans, decontamination procedures, and monitoring to demonstrate

satisfactory operation. The operational systems for respiratory protection and the negative pressure system shall be demonstrated for proper performance.

- c. The CPIH/CIH shall document the pre-abatement activities described above and deliver a copy to the VA's representative.
 - d. Upon satisfactory inspection of the installation of and operation of systems, the VA's representative will notify the Contractor in writing to proceed with the asbestos abatement work in accordance with this specification and all applicable regulations.
3. Pre-Abatement Inspections and Preparations:
- a. Before any work begins on the construction of the regulated area, the Contractor will:
 - 1) Conduct a space-by-space inspection with an authorized VA representative and prepare a written inventory of all existing damage in those spaces where asbestos abatement will occur. Still or video photography may be used to supplement the written damage inventory. Document will be signed and certified as accurate by both parties.
 - 2) A NESHAP (destructive) ACM inspection shall be conducted on all building structures that will be demolished. Ensure the following areas are inspected on the project: lay-in ceilings concealing ACM; ACM behind walls/windows from previous renovations; inside utility chases/walls; transite piping/ductwork/sheets; behind radiators; lab fume hoods; transite lab countertops; roofing materials; below window sills; water/sewer lines; electrical conduit coverings; crawlspaces (previous abatement contamination); flooring/mastic covered by carpeting/new flooring; exterior insulated wall panels; on underground fuel tanks; and steam line trench coverings. Verify during NESHAP survey that no other suspect ACM is present.
 - 3) Ensure that all furniture, machinery, equipment, curtains, drapes, blinds, and other movable objects required to be removed from the regulated area have been cleaned and removed or properly protected from contamination.
 - 4) If present and required, remove and dispose of carpeting from floors in the regulated area.

- 5) Inspect existing firestopping in the regulated area. Correct as needed.

3.2 REMOVAL OF ACM

A. Wetting ACM:

1. Use amended water for the wetting of ACM prior to removal. The Competent Person shall assure the wetting of ACM meets the definition of "adequately wet" in the EPA NESHAP regulation and OSHA's "wet methods" for the duration of the project. A removal encapsulant may be used instead of amended water with written approval of the VA's representative.
2. Amended Water: Provide water to which a surfactant has been added to wet the ACM and reduce the potential for fiber release during disturbance of ACM. The mixture must be equal to or greater than the wetting provided by water amended by a surfactant consisting of one ounce of 50 percent polyoxyethylene ester and 50 percent polyoxyethylene ether mixed with 5 gallons (19L) of water.
3. Removal Encapsulant: When authorized by VA, provide a removal encapsulant designed specifically for the removal of ACM. The material must, when used, result in adequate wetting of the ACM and retard fiber release during removal.

B. Secondary Barrier and Walkways:

1. Install as a drop cloth a 6-mil poly sheet at the beginning of each work shift where removal is to be done during that shift. Completely cover floors and any walls within 10 feet of the area where work is to be done. Secure the secondary barrier with duct tape to prevent it from moving or debris from getting behind it. Remove the secondary barrier at the end of the shift or as work in the area is completed. Keep residue on the secondary barrier wetted. When removing, fold inward to prevent spillage and place in a disposal bag.
2. Install walkways using 6-mil black poly between the regulated area and the decontamination facilities (PDF and W/EDF) to protect the primary layers from contamination and damage. Install the walkways at the beginning of each shift and remove at the end of each shift.

C. Wet Removal of ACM:

1. Adequately and thoroughly wet the ACM to be removed prior to removal with amended water or when authorized by VA, removal encapsulant to reduce/prevent fiber release to the air. Adequate time must be

allowed for the amended water or removal encapsulant to saturate the ACM. Abatement personnel must not disturb dry ACM. Use a fine spray of amended water or removal encapsulant. Saturate the material sufficiently to wet to the substrate without causing excessive dripping. The material must be sprayed repeatedly/continuously during the removal process in order to maintain adequately wet conditions. Removal encapsulants must be applied in accordance with the manufacturer's written instructions. Perforate or carefully separate, using wet methods, an outer covering that is painted or jacketed in order to allow penetration and wetting of the material. Where necessary, carefully remove covering while wetting to minimize fiber release. **In no event shall dry removal occur except when authorized in writing by the VPIH/CIH and VA when a greater safety hazard (e.g., electricity) is present.**

2. If ACM does not wet well with amended water due to composition, coating or jacketing, remove as follows:
 - a. Mist work area continuously with amended water whenever necessary to reduce airborne fiber levels.
 - b. Remove saturated ACM in small sections. Do not allow material to dry out. As material is removed, bag material, while still wet into disposal bags. Twist the bag neck tightly, bend over (gooseneck) and seal with a minimum of three tight wraps of duct tape. Clean /decontaminate the outside of the bag of any residue and move to washdown station adjacent to W/EDF.
 - c. Fireproofing or Architectural Finish on Scratch Coat: Spray with a fine mist of amended water or removal encapsulant. Allow time for saturation to the substrate. Do not over saturate causing excess dripping. Scrape material from substrate. Remove material in manageable quantities and control falling to staging or floor. If the falling distance is over 20 feet, use a drop chute to contain material through descent. Remove residue remaining on the scratch coat after scraping is done using a stiff bristle hand brush. If a removal encapsulant is used, remove residue completely before the encapsulant dries. Periodically re-wet the substrate with amended water as needed to prevent drying of the material before the residue is removed from the substrate.

- d. Fireproofing or Architectural Finish on Wire Lath: Spray with a fine mist of amended water or removal encapsulant. Allow time to completely saturate the material. Do not over saturate causing excess dripping. If the surface has been painted or otherwise coated, cut small holes as needed and apply amended water or removal encapsulant from above. Cut saturated wire lath into 2 feet x 6 feet sections and cut hanger wires. Roll up complete with ACM, cover in burlap and hand place in disposal bag. Do not drop to floor. After removal of lath/ACM, remove any overspray on decking and structure using stiff bristle nylon brushes. Depending on hardness of overspray, scrapers may be needed for removal.
- e. Pipe/Tank/Vessel/Boiler Insulation: Remove the outer layer of wrap while spraying with amended water in order to saturate the ACM. Spray ACM with a fine mist of amended water or removal encapsulant. Allow time to saturate the material to the substrate. Cut bands holding pre-formed pipe insulation sections. Slit jacketing at the seams, remove and hand place in a disposal bag. Do not allow dropping to the floor. Remove molded fitting insulation/mud in large pieces and hand place in a disposal bag. Remove any residue on pipe or fitting with a stiff bristle nylon brush. In locations where pipe fitting insulation is removed from fibrous glass or other non-asbestos insulated straight runs of pipe, remove fibrous material at least 6 inches from the point it contacts the ACM.

D. Wet Removal of Amosite:

- 1. The following areas shown on drawings indicate locations of amosite ACM which will require local exhaust ventilation and collection as described below, in addition to wet removal. Provide specific description /locations/ drawings.
- 2. Provide local exhaust ventilation and collection systems to assure collection of amosite fibers at the point of generation. A 12" flexible rigid non-collapsing duct shall be located no more than 2 feet from any scraping/brushing activity. Primary filters must be replaced every 30 minutes on the negative air machines. Each scraping/brushing activity must have a negative air machine devoted to it. For pre-molded pipe insulation or cutting wire lathe attach a

4 feet square flared end piece on the intake of the duct. Support the duct horizontally at a point 2 feet below the work to effect capture. One person in the crew shall be assigned to operate the duct collection system on a continual basis.

3. Amosite does not wet well with amended water. Submit full information/documentation on the wetting agent proposed prior to start for review and approval by the VPIH/CIH and VA Contracting Officer. Insure that the material is worked on in small sections and is thoroughly and continuously wetted. Package as soon as possible while wet. Remove as required.

E. Removal of ACM/Dirt Floors and Other Special Procedures:

1. Major Abatement on Dirt Floors: When working on dirt floors, remove all visible asbestos debris using wet methods after set-up of PDF, W/EDF, negative air systems as required. Perform work and decontaminate/clean-up; perform lockdown as needed and complete work as required in these specifications. The asbestos contaminated soil (ACS) shall be removed and/or enclosed.
2. Options for abatement of asbestos contaminated soil include: Removal of top 6 inches of soil; encapsulate the soil using shotcrete or other spray applied concrete materials. Considerations for which option to be used will be made by the VA representative. Factors which may affect which option to be used may include: access to the work area; height of the area (such as is there sufficient height to use concrete materials in the area, etc.). Soils covered with permanent barriers **MUST HAVE PERMANENT SIGNAGE INSTALLED TO WARN AGAINST PENETRATION ASSOCIATED WITH POTENTIAL DISTURBANCE OF ASBESTOS.**
 - a. Remove ACS as shown on drawings to a minimum depth of 6 using wet methods. After wetting with amended water to minimize dust, shovel dirt into disposal bags. The CPIH/CIH shall closely monitor work conditions and take appropriate action to protect workers from over exposure to asbestos and heat stress. The minimum number of air changes per hour shall be six using negative air machines. Use of special vacuum truck equipped with HEPA filtration to remove soil is an acceptable option.
 - b. Enclosure of ACS using a concrete layer of 4 inches over the entire surface may also be done. Thoroughly dampen soil first

with amended water before pouring concrete. Personnel shall be proficient in concrete finishing as well as asbestos trained.

3. Crawlspace/Pipe Tunnels: When working in crawlspaces or pipe tunnels, remove all visible asbestos debris using wet methods (if possible) after set-up of PDF, W/EDF, and after establishing negative air systems as required. Perform work and decontaminate/clean-up; perform lockdown as needed and complete work as required in these specifications. The asbestos contaminated soil (ACS) shall be removed and/or enclosed. Clearance requirements include confirmation sampling of affected soil by Polarized Light Microscopy (PLM). Clearance sampling requirements are specified in Sections 3.6.4 3.6.5 and 3.6.6.
4. Options for abatement of asbestos contaminated soil include: Removal of top 6 inches of soil; encapsulate the soil using shotcrete or other spray applied concrete materials. Considerations for which option to be used will be made by the VA representative. Factors which may affect which option to be used may include: access to the work area; height of the area (such as is there sufficient height to use concrete materials in the area, etc.).

3.3 LOCKDOWN ENCAPSULATION

- A. General: Lockdown encapsulation is an integral part of the ACM removal. At the conclusion of ACM removal and before removal of the primary barriers, the contractor shall encapsulate all surfaces with a bridging encapsulant.
- B. Delivery and Storage: Deliver materials to the job site in original, new and unopened containers bearing the manufacturer's name and label as well as the following information: name of material, manufacturer's stock number, date of manufacture, thinning instructions, application instructions and the SDS for the material.
- C. Worker Protection: Before beginning work with any material for which an SDS has been submitted, provide workers with any required personal protective equipment. The required personal protective equipment shall be used whenever exposure to the material might occur. In addition to OSHA/specification requirements for respiratory protection, a paint pre-filter and an organic vapor cartridge, at a minimum, shall be used in addition to the HEPA filter when an organic solvent based encapsulant or other solvent is used. The CPIH/CIH shall be responsible

for provision of adequate respiratory protection. Note: Flammable and combustible encapsulants or solvents shall not be used, unless authorized in writing by the VA.

D. Encapsulation of Scratch Coat Plaster or Piping:

1. Apply two coats of lockdown encapsulant to the scratch coat plaster or piping after all ACM has been removed. Apply in strict accordance with the manufacturer's instructions. Any deviation from the instructions must be approved by the VA's representative in writing prior to commencing the work.
2. Apply the lockdown encapsulant with an airless sprayer at a pressure and using a nozzle orifice as recommended by the manufacturer. Apply the first coat while the scratch coat is still damp from the asbestos removal process, after passing the visual inspection. If the surface has been allowed to dry, wet wipe or HEPA vacuum prior to spraying with encapsulant. Apply a second coat over the first coat in strict conformance with the manufacturer's instructions. Color the lockdown encapsulant and contrast the color in the second coat so that visual confirmation of completeness and uniform coverage of each coat is possible. Adhere to the manufacturer's instructions for coloring. At the completion of the encapsulation, the surface must be a uniform third color produced by the mixture.

- E. Sealing Exposed Edges: Seal edges of ACM exposed by removal work which is inaccessible, such as a sleeve, wall penetration, etc., with two coats of bridging encapsulant. Prior to sealing, permit the exposed edges to dry completely to permit penetration of the bridging encapsulant. Apply in accordance with 3.3.4 (B).

3.4 DISPOSAL OF ACM WASTE MATERIALS

- A. General: Dispose of waste ACM and debris which is packaged in accordance with these specifications, in accordance with OSHA, EPA, State, Local and DOT requirements. The landfill requirements for packaging must also be met. Transport will be in compliance with 49 CFR 171-180 regulations. Disposal shall be done at an approved landfill. Disposal of non-friable ACM shall be done in accordance with applicable regulations.
- B. Procedures:
1. The VA must be notified at least 24 hours in advance of any waste removed from the containment.

2. Asbestos waste shall be packaged and moved through the W/EDF into a covered transport container in accordance with procedures in this specification. Waste shall be double-bagged and wetted with amended water prior to disposal. Wetted waste can be very heavy. Bags shall not be overfilled. Bags shall be evacuated with HEPA vacuum and securely sealed to prevent accidental opening and/or leakage. The top shall be tightly twisted and goose necked prior to tightly sealing with at least three wraps of duct tape. Ensure that unauthorized persons do not have access to the waste material once it is outside the regulated area. All transport containers must be covered at all times when not in use. NESHAP signs must be on containers during loading and unloading. Material shall not be transported in open vehicles. If drums are used for packaging, the drums shall be labeled properly and shall not be re-used.
3. Waste Load Out: Waste load out shall be done in accordance with the procedures in W/EDF Decontamination Procedures. Sealed waste bags shall be decontaminated on exterior surfaces by wet cleaning and HEPA vacuuming before being placed in the second waste bag and sealed, which then must also be wet wiped and HEPA vacuumed.
4. Asbestos waste with sharp edged components, i.e., nails, screws, lath, strapping, tin sheeting, jacketing, metal mesh, etc., which might tear poly bags shall be wrapped securely in burlap before packaging and, if needed, use a poly lined fiber drum as the second container, prior to disposal.

3.5 PROJECT DECONTAMINATION

A. General:

1. The entire work related to project decontamination shall be performed under the close supervision and monitoring of the CPIH/CIH.
2. If the asbestos abatement work is in an area which was contaminated prior to the start of abatement, the decontamination will be done by cleaning the primary barrier poly prior to its removal and cleanings of the surfaces of the regulated area after the primary barrier removal.
3. If the asbestos abatement work is in an area which was uncontaminated prior to the start of abatement, the decontamination will be done by cleaning the primary barrier poly prior to its

removal, thus preventing contamination of the building when the regulated area critical barriers are removed.

- B. Regulated Area Clearance: Clearance air testing and other requirements which must be met before release of the Contractor and re-occupancy of the regulated area space are specified in Final Testing Procedures.
- C. Work Description: Decontamination includes the clearance air testing in the regulated area and the decontamination and removal of the enclosures/facilities installed prior to the abatement work including primary/critical barriers, PDF and W/EDF facilities, and negative pressure systems.
- D. Pre-Decontamination Conditions:
 - 1. Before decontamination starts, all ACM waste from the regulated area shall be collected and removed, and the loose 6-mil layer of poly removed while being adequately wetted with amended water and disposed of along with any gross debris generated by the work.
 - 2. At the start of decontamination, the following shall be in place:
 - a. Primary barriers consisting of 2 layers of 6-mil poly on the floor and 4 mil poly on the walls.
 - b. Critical barriers consisting of 2 layers of 6-mil poly which is the sole barrier between the regulated area and openings to the rest of the building or outside.
 - c. Decontamination facilities for personnel and equipment in operating condition and the negative pressure system in operation.
- E. First Cleaning: Carry out a first cleaning of all surfaces of the regulated area including items of remaining poly sheeting, tools, scaffolding, ladders/staging by wet methods and HEPA vacuuming. Do not use dry dusting/sweeping/air blowing methods. Use each surface of a wetted cleaning cloth one time only and then dispose of as contaminated waste. Continue this cleaning until there is no visible residue from abated surfaces or poly or other surfaces. Remove all filters in the air handling system and dispose of as ACM waste in accordance with these specifications. The negative pressure system shall remain in operation during this time. Additional cleaning(s) may be needed as determined by the CPIH/VPIH/CIH.
- F. Pre-Clearance Inspection and Testing: The CPIH/CIH and VPIH/CIH will perform a thorough and detailed visual inspection at the end of the cleaning to determine whether there is any visible residue in the

regulated area. If the visual inspection is acceptable, the CPIH/CIH will perform pre-clearance sampling using aggressive clearance as detailed in 40 CFR 763 Subpart E (AHERA) Appendix A (III) (B) (7) (d). If the sampling results show values below 0.01 f/cc, then the Contractor shall notify the VA's representative of the results with a brief report from the CPIH/CIH documenting the inspection and sampling results and a statement verifying that the regulated area is ready for lockdown encapsulation. The VA reserves the right to utilize their own VPIH/CIH to perform a pre-clearance inspection and testing for verification.

- G. Lockdown Encapsulation of Abated Surfaces: With the express written permission of the VA's representative, perform lockdown encapsulation of all surfaces from which asbestos was abated in accordance with the procedures in this specification. Negative pressure shall be maintained in the regulated area during the lockdown application.

3.6 FINAL VISUAL INSPECTION AND AIR CLEARANCE TESTING

- A. General: Notify the VA representative 24 hours in advance for the performance of the final visual inspection and testing. The final visual inspection and testing will be performed by the VPIH/CIH starting after the final cleaning.
- B. Final Visual Inspection: Final visual inspection will include the entire regulated area, the PDF, all poly sheeting, seals over HVAC openings, doorways, windows, and any other openings. If any debris, residue, dust or any other suspect material is detected, the final cleaning shall be repeated at no additional cost to the VA. Dust/material samples may be collected and analyzed at no additional cost to the VA at the discretion of the VPIH/CIH to confirm visual findings. When the regulated area is visually clean the final testing can be done.
- C. Final Air Clearance Testing:
1. After an acceptable final visual inspection by the VPIH/CIH and VA Representative, the VPIH/CIH will perform the final clearance testing. Air samples will be collected and analyzed in accordance with procedures for AHERA in this specification. If work is less than 260 lf/160 sf/35 cf, 5 PCM samples shall be collected for clearance and a minimum of two field blank. If work is equal to or more than 260 lf/160 sf/35 cf, AHERA TEM sampling shall be performed for clearance. TEM analysis shall be done in accordance with

procedures for EPA AHERA presented in this specification. If the release criteria are not met, the Contractor shall repeat the final cleaning and continue decontamination procedures until clearance is achieved. **All Additional inspection and testing costs will be borne by the Contractor.**

2. If release criteria are met, proceed to perform the abatement closeout and to issue the certificate of completion in accordance with these specifications.

D. Final Air Clearance Procedures:

1. Contractor's Release Criteria: Work in a regulated area is complete when the regulated area is visually clean and airborne fiber levels have been reduced to or below 0.01 f/cc as measured by the AHERA PCM protocol and < 70 AHERA asbestos structures per square millimeter (s/mm²) by AHERA TEM. No averaging of results will be used for this project. All five (5) TEM samples inside the regulated area shall be at or below 70 asbestos s/mm² to satisfy the project final clearance criteria.
2. Air Monitoring and Final Clearance Sampling: To determine if the elevated airborne fiber counts encountered during abatement operations have been reduced to the specified level, the VPIH/CIH will secure samples and analyze them according to the following procedures:
 - a. Fibers Counted: "Fibers" referred to in this section shall be either all fibers regardless of composition as counted in the NIOSH 7400 PCM method or asbestos fibers counted using the AHERA TEM method.
 - b. Aggressive Sampling: All final air testing samples shall be collected using aggressive sampling techniques except where soil is not encapsulated or enclosed. Samples will be collected on 0.8µ MCE filters for PCM analysis and 0.45µ MCE for TEM. A minimum of 3850 Liters of air using calibrated sampling pumps shall be collected for PCM samples and a minimum of 1200 Liters of air using calibrated sampling pumps shall be collected for TEM clearance samples. Before pumps are started, initiate aggressive air mixing sampling as detailed in 40 CFR 763 Subpart E (AHERA) Appendix A (III) (B) (7) (d). Air samples will be collected in areas subject to normal air circulation away from corners, obstructed

locations, and locations near windows, doors, or vents. After air sampling pumps have been shut off, circulating fans shall be shut off. The negative pressure system shall continue to operate.

- c. Final clearance for soil that is not encapsulated, samples will be collected on 0.8µ MCE filters for PCM analysis and 0.45µ MCE filters for TEM. A minimum of 3850 Liters of air using calibrated sampling pumps shall be collected for PCM samples and a minimum of 1200 Liters of air using calibrated sampling pumps shall be collected for TEM clearance samples. Air clearance of work areas where contaminated soil has been removed is in addition to the requirement for clearance by bulk sample analysis discussed within these specifications. There will be no aggressive air sampling for the clearance of soil due to the fact that aggressive air sampling may overload the cassettes.
- d. Random bulk samples shall be collected from areas of soil which have been abated to ensure that the soil has been properly decontaminated. The total number of samples to be collected from the soil areas shall be; <1000 square feet of soil - 3 samples; >1000 to <5000 square feet of soil - 5 samples; and >5000 square feet of soil - 7 samples. The soil samples shall be collected in a statistically random manner and shall be analyzed by PLM method. The clearance level to determine the soil clean is <1 percent asbestos by weight as analyzed by PLM method. If this level is achieved, the soil areas shall be considered clear. If the levels are >1 percent asbestos, the areas shall be re-cleaned until the sample results are <1 percent.

E. Clearance Sampling Using PCM - Less than 260LF/160SF:

- 1. The VPIH/CIH will perform clearance samples as indicated by the specification.
- 2. The NIOSH 7400 PCM method will be used for clearance sampling with a minimum collection volume of 3850 Liters of air. A minimum of 5 PCM clearance samples shall be collected. All samples must be equal to or less than 0.01 f/cc to clear the regulated area.
- 3. Random bulk samples shall be collected from areas of soil which have been abated to ensure that the soil has been properly decontaminated. The total number of samples to be collected from the soil areas shall be; <1000 square feet of soil - 3 samples; >1000 to

<5000 square feet of soil - 5 samples; and >5000 square feet of soil - 7 samples. The soil samples shall be collected in a statistically random manner and shall be analyzed by PLM method. The clearance level to determine the soil clean is <1 percent asbestos by weight as analyzed by PLM method. If this level is achieved, the soil areas shall be considered clear. If the levels are >1 percent asbestos, the areas shall be re-cleaned until the sample results are <1 percent.

- F. Clearance Sampling Using Tem - Equal to or more than 260LF/160SF: TEM
1. Clearance requires 13 samples be collected; 5 inside the regulated area; 5 outside the regulated area; and 3 field blanks.
 2. The TEM method will be used for clearance sampling with a minimum collection volume of 1200 Liters of air. A minimum of 13 clearance samples shall be collected. All samples must be equal to or less than 70 AHERA structures per square millimeter (s/mm²) AHERA TEM, no averaging of results for this specific project.
- G. Laboratory Testing of PCM Clearance Samples: The services of an AIHA accredited laboratory will be employed by the VA to perform analysis for the PCM air samples. The accredited laboratory shall be successfully participating in the AIHA Proficiency Analytical Testing (PAT) program. Samples will be sent daily by the VPIH/CIH so that verbal/faxed reports can be received within 24-36 hours. A complete record, certified by the laboratory, of all air monitoring tests and results will be furnished to the VA's representative and the Contractor.
- H. Laboratory Testing of Tem Samples: Samples shall be sent by the VPIH/CIH to a NIST NVLAP accredited laboratory for analysis by TEM. The laboratory shall be successfully participating in the NIST Airborne Asbestos Analysis (TEM) program. Verbal/faxed results from the laboratory shall be available within 24-36 hours after receipt of the samples. A complete record, certified by the laboratory, of all TEM results shall be furnished to the VA's representative and the Contractor.
- I. Laboratory Testing of Bulk Samples: Samples shall be sent by the VPIH/CIH or CPIH/CIH to a NIST NVLAP accredited laboratory for analysis by PLM. The laboratory shall successfully participate in the NIST NVLAP Bulk Asbestos Analysis (PLM) program. Verbal/faxed results from the

laboratory shall be available within 24-36 hours after receipt of the samples. A complete record, certified by the laboratory, of all PLM and/or TEM results shall be furnished to the VA's representative and the Contractor.

3.7 ABATEMENT CLOSEOUT AND CERTIFICATE OF COMPLIANCE

A. Completion of Abatement Work:

1. After thorough decontamination, seal negative air machines with 2 layers of 6-mil poly and duct tape to form a tight seal at the intake/outlet ends before removal from the regulated area. Complete asbestos abatement work upon meeting the regulated area visual and air clearance criteria and fulfilling the following:
 - a. Remove all equipment and materials from the project area.
 - b. Dispose of all packaged ACM waste as required.
 - c. Repair or replace all interior finishes damaged during the abatement work, as required. Ensure temporary caulk is installed along abated edges to ensure temporary measures for building tightness to prevent leaks or moisture penetration until other construction activities can be completed.
 - d. Fulfill other project closeout requirements as required in this specification.

B. Certificate of Completion By Contractor: The CPIH/CIH shall complete and sign the "Certificate of Completion" in accordance with Attachment 1 at the completion of the abatement and decontamination of the regulated area.

C. Work Shifts: All work shall generally be done during administrative hours (8:00 AM to 4:30 PM) Monday - Friday excluding Federal Holidays. Any change in the work schedule must be approved in writing by the VA Representative.

D. Re-Insulation: If required as part of the contract, replace all asbestos containing insulation/fire-proofing with suitable non-asbestos material. Provide SDS's for all replacement materials in advance of installation for VA approval. Refer to Section 23 07 11, HVAC, PLUMBING, AND BOILER PLANT INSULATION.

ATTACHMENT #1
CERTIFICATE OF COMPLETION

DATE: _____ VA Project #: _____
PROJECT NAME: _____ Abatement Contractor: _____
VAMC/ADDRESS: _____

1. I certify that I have personally inspected, monitored and supervised the abatement work of (specify regulated area or Building):
which took place from / / to / /
2. That throughout the work all applicable requirements/regulations and the VA's specifications were met.
3. That any person who entered the regulated area was protected with the appropriate personal protective equipment and respirator and that they followed the proper entry and exit procedures and the proper operating procedures for the duration of the work.
4. That all employees of the Abatement Contractor engaged in this work were trained in respiratory protection, were experienced with abatement work, had proper medical surveillance documentation, were fit-tested for their respirator, and were not exposed at any time during the work to asbestos without the benefit of appropriate respiratory protection.
5. That I performed and supervised all inspection and testing specified and required by applicable regulations and VA specifications.
6. That the conditions inside the regulated area were always maintained in a safe and healthy condition and the maximum fiber count never exceeded 0.5 f/cc, except as described below.
7. That all abatement work was done in accordance with OSHA requirements and the manufacturer's recommendations.

CPIH/CIH Signature/Date: _____

CPIH/CIH Print Name: _____

Abatement Contractor Signature/Date: _____

Abatement Contractor Print Name: _____

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ATTACHMENT #2

CERTIFICATE OF WORKER'S ACKNOWLEDGMENT

PROJECT NAME: _____ DATE: _____

PROJECT ADDRESS: _____

ABATEMENT CONTRACTOR'S NAME: _____

WORKING WITH ASBESTOS CAN BE HAZARDOUS TO YOUR HEALTH. INHALING ASBESTOS HAS BEEN LINKED WITH VARIOUS TYPES OF CANCERS. IF YOU SMOKE AND INHALE ASBESTOS FIBERS, YOUR CHANCES OF DEVELOPING LUNG CANCER IS GREATER THAN THAT OF THE NON-SMOKING PUBLIC.

Your employer's contract with the owner for the above project requires that: You must be supplied with the proper personal protective equipment including an adequate respirator and be trained in its use. You must be trained in safe and healthy work practices and in the use of the equipment found at an asbestos abatement project. You must receive/have a current medical examination for working with asbestos. These things shall be provided at no cost to you. By signing this certificate of worker's acknowledgement you are indicating to the owner that your employer has met these obligations.

RESPIRATORY PROTECTION: I have been trained in the proper use of respirators and have been informed of the type of respirator to be used on the above indicated project. I have a copy of the written Respiratory Protection Program issued by my employer. I have been provided for my exclusive use, at no cost, with a respirator to be used on the above indicated project.

TRAINING COURSE: I have been trained by a third party, State/EPA accredited trainer in the requirements for an AHERA/OSHA Asbestos Abatement Worker training course, 32-hours minimum duration. I currently have a valid State accreditation certificate. The topics covered in the course include, as a minimum, the following:

- Physical Characteristics and Background Information on Asbestos
- Potential Health Effects Related to Exposure to Asbestos
- Employee Personal Protective Equipment
- Establishment of a Respiratory Protection Program
- State of the Art Work Practices
- Personal Hygiene
- Additional Safety Hazards
- Medical Monitoring
- Air Monitoring
- Relevant Federal, State and Local Regulatory Requirements, Procedures, and Standards
- Asbestos Waste Disposal

MEDICAL EXAMINATION: I have had a medical examination within the past 12 months which was paid for by my employer. This examination included: health history, occupational history, pulmonary function test, and may have included a chest x-ray evaluation. The physician issued a positive written opinion after the examination.

Signature: _____

Printed Name: _____

Social Security Number: _____

Witness: _____

ATTACHMENT #3

**AFFIDAVIT OF MEDICAL SURVEILLANCE, RESPIRATORY PROTECTION AND
TRAINING/ACCREDITATION**

VA PROJECT NAME AND NUMBER: _____

VA MEDICAL FACILITY: _____

ABATEMENT CONTRACTOR'S NAME AND ADDRESS: _____

1. I verify that the following individual

Name: _____ Social Security Number: _____

who is proposed to be employed in asbestos abatement work associated with the above project by the named Abatement Contractor, is included in a medical surveillance program in accordance with 29 CFR 1926.1101(m), and that complete records of the medical surveillance program as required by 29 CFR 1926.1101(m) (n) and 29 CFR 1910.20 are kept at the offices of the Abatement Contractor at the following address.

Address: _____

2. I verify that this individual has been trained, fit-tested and instructed in the use of all appropriate respiratory protection systems and that the person is capable of working in safe and healthy manner as expected and required in the expected work environment of this project.

3. I verify that this individual has been trained as required by 29 CFR 1926.1101(k). This individual has also obtained a valid State accreditation certificate. Documentation will be kept on-site.

4. I verify that I meet the minimum qualifications criteria of the VA specifications for a CPIH.

Signature of CPIH/CIH: _____ Date: _____

Printed Name of CPIH/CIH: _____

Signature of Contractor: _____ Date: _____

Printed Name of Contractor: _____

ATTACHMENT #4

**ABATEMENT CONTRACTOR/COMPETENT PERSON(S) REVIEW AND ACCEPTANCE OF THE VA'S
ASBESTOS SPECIFICATIONS**

VA Project Location:_____

VA Project #:_____

VA Project Description:_____

1. This form shall be signed by the Asbestos Abatement Contractor Owner and the Asbestos Abatement Contractor's Competent Person(s) prior to any start of work at the VA related to this Specification. If the Asbestos Abatement Contractor's/Competent Person(s) has not signed this form, they shall not be allowed to work on-site.

- 2 I, the undersigned, have read VA's Asbestos Specification regarding the asbestos abatement requirements. I understand the requirements of the VA's Asbestos Specification and agree to follow these requirements as well as all required rules and regulations of OSHA/EPA/DOT and State/Local requirements. I have been given ample opportunity to read the VA's Asbestos Specification and have been given an opportunity to ask any questions regarding the content and have received a response related to those questions. I do not have any further questions regarding the content, intent and requirements of the VA's Asbestos Specification.

3. At the conclusion of the asbestos abatement, I will certify that all asbestos abatement work was done in accordance with the VA's Asbestos Specification and all ACM was removed properly and no fibrous residue remains on any abated surfaces.

Abatement Contractor Owner's Signature_____Date_____

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SECTION 03 01 05
CLEANING EXTERIOR FACADES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes cleaning of exposed aggregate architectural precast concrete facade elements and brick masonry walls as follows:
 - 1. Applying cleaning trial samples of all specified cleaning systems, as outlined in this section.
 - 2. Cleaning of all exterior precast concrete elements and brick masonry wall areas where designated on the Drawings by chemical and water cleaning methods, as determined by cleaning trial samples.
 - 3. Removal of localized severe soiling or staining.
 - 4. Providing access to all work areas during cleaning work for inspection by COR and Architect/Engineer.

1.2 RELATED WORK:

- A. SECTION 03 01 31 - CONCRETE REMOVAL AND SURFACE PREPARATION
- B. SECTION 03 33 00 - ARCHITECTURAL CONCRETE REPAIRS
- C. SECTION 04 12 10 - BRICK MASONRY REPAIR AND REPLACEMENT
- D. SECTION 04 91 60 - REPOINTING WITH CEMENT-LIME MORTAR
- E. SECTION 07 19 00 - WATER REPELLENTS

1.3 DEFINITIONS

- A. Very Low-Pressure Water: Less than 100 psi; 4 to 6 gpm.
- B. Low-Pressure Water: 100 to 400 psi; 4 to 6 gpm.
- C. Medium-Pressure Water: 400 to 800 psi; 4 to 6 gpm.
- D. High-Pressure Water: 800 to 1200 psi; 4 to 6 gpm. High pressure water cleaning is usually not appropriate for architectural concrete and can result in damage to the substrate.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's product literature and application instructions for all products used in cleaning before the work begins.
 - 1. Include Manufacturer's Safety Data Sheets for information only; safety restrictions are sole responsibility of Contractor.
- B. Samples for Verification: Before installing trial samples, submit samples of the following:
 - 1. Samples of cleaning chemicals for testing and verification.
- C. Qualification Data: For cleaning contractor or subcontractor/personnel.
 - 1. Submit to the COR a list of similar cleaning projects performed within the previous five (5) years. For each project, include

- project address, description of cleaning scope of work, list of cleaning materials and systems used, and Owner contact information.
- D. Protection Plan: Submit to COR a written plan describing all protection measures and systems proposed by Contractor for use during the work.
- E. Collection and Disposal Plan: Submit to COR a written plan describing methods for collection and control of runoff during cleaning operations.

1.5 QUALITY ASSURANCE

- A. Contractor Qualifications: An entity that employs installers and supervisors who are trained and approved by the manufacturer to apply the cleaning materials.
1. Firm shall have completed work similar to that indicated for this Project at a minimum of three (3) projects with a record of successful in-service performance.
 2. Contractor performing this work shall have at least five (5) years' experience in the cleaning of architectural precast concrete and brick masonry facades.
- B. Cleaning Worker Qualifications: Persons who are experienced and specialize in exterior facade and architectural precast concrete cleaning work of types they will be performing.
1. Supervisory personnel shall have not less than three (3) years' experience in supervising this type of work. All apprentices shall be under the direct supervision of an experienced supervisor.
 2. Cleaners performing the work shall be experienced in the use of chemical and water cleaning systems.
 3. Keep at the project site, during the period when work is being performed, a competent superintendent/working foreman satisfactory to the COR.
 4. The approved working foreman shall not be removed from the project without cause or without prior notification of the COR. If removal is for cause, Contractor shall submit justification in writing within 24 hours of the removal. All work will cease until a new working foreman is on-site.
- C. Cleaning System Manufacturer Qualifications: Cleaning system shall be provided by a firm that regularly engages in producing architectural precast concrete and exterior masonry facade cleaners that have been used for similar applications with successful results, and with

technical representatives who are available for consultation and project site inspection and assistance at no additional cost.

- D. Trial samples and mockups: Prepare trial samples and mockups of each cleaning approach specified herein to demonstrate effects and qualities of materials and execution. Prepare trial samples and mockups on existing walls under same weather conditions to be expected during remainder of the Work.

1. Include as part of each trial sample every protection system or device proposed for the protection of the non-precast concrete elements. The protection system(s) shall be tested to determine its vulnerability to weather and effectiveness. The Owner may require that the Contractor conduct tests of the protection system before the cleaning work begins.
2. Execute a trial sample using the materials and techniques for each specified cleaning system.
 - a. Area(s) where trial samples are to be applied shall be selected and approved by the COR in consultation with the Contractor.
 - b. Area of each trial sample shall be 4 square feet in area for each type of architectural precast concrete and surface condition.
 - c. Additional trial samples may be made until an acceptable result is achieved. Minor adjustments to methods of application, dilutions, and dwell times of products shall be made in accordance with limits defined in manufacturer's recommendations.
3. Prior to proceeding with samples, test cleaners and methods for adverse reactions on adjacent materials or other materials that may be affected by the cleaning process, if those materials are to remain unprotected. Test areas shall be small and in unobtrusive locations. Protect against known deleterious effects of cleaners and methods during testing.
4. Do not proceed with mockups prior to selection and approval of cleaning trial sample(s) by the COR.
5. Allow a waiting period of not less than fourteen (14) days after completion of trial sample cleaning to permit a study of sample area for effectiveness of cleaner and for negative reactions.
6. Cleaning trial samples are not to be directly adjacent to each other. Trial samples are to be separated with untouched surfaces for a comparison of before and after.

E. Mockups: Upon selection of cleaning approach(es) based upon review of trial samples, prepare mockup(s) of the selected approach(es) to establish a quality standard for execution. Prepare mockups on existing walls under same weather conditions to be expected during remainder of the Work.

1. Include as part of the mockup each protection system or device proposed for the protection of the non-precast concrete elements, based upon the results of trial samples.
2. Execute the mockup using the materials and techniques for the specified cleaning system, with adjustments as indicated by the COR in writing based on the trials.
 - a. Area(s) where mockups are to be applied shall be selected and approved by the COR in consultation with the Contractor.
 - b. Area of each mockup shall be 10 square feet in area for each type of architectural precast concrete and surface condition.
 - c. Additional mockups shall be made until an acceptable result is achieved on each material. Minor adjustments to methods of application, dilutions, and dwell times of products shall be made in accordance with limits defined in manufacturer's recommendations.
3. Do not proceed with work prior to approval of cleaning mockup(s) by the COR.
4. Allow a waiting period of not less than fourteen (14) days after completion of mockup cleaning to permit a study of sample area for effectiveness of cleaner and for negative reactions.
5. Protect mockup during the work. Approved mockups shall be the standard of work for all architectural precast cleaning on the project.

1.6 DELIVERY STORAGE AND HANDLING

- A. Deliver materials to Site in original containers with seals unbroken, labeled with manufacturer name, product name/type, date of manufacture, lot number, and directions for storing and mixing with other components. Materials shall be clearly labeled with safety warnings.
- B. Comply with manufacturers' written instructions for minimum and maximum temperature requirements and other conditions for storage. Maintain MSDS for cleaning materials with materials in storage area and

available for ready reference on project site. Provide adequate ventilation in storage area. Always seal containers after dispensing.

- C. Do not alter or mix with other chemicals.
- D. Remove materials that cannot be applied within stated shelf life from site and replace with new materials. Dispose of unused product and containers in accordance with local, state and federal regulations.

1.7 PROJECT CONDITIONS

- A. Confine operations at Site to areas permitted by laws, permits, contract, and the Owner.
- B. Assume full responsibility for protection and safekeeping of products stored on premises, and for their proper use.
- C. No chemical cleaners containing any amount of hydrochloric (muriatic) acid, hydrofluoric acid, or ammonium bifluoride shall be used for any purpose on the project.
- D. Comply with city, state, water department, and Federal regulations covering protection and waste water disposal. Environmental Limitations are as follows:
 - 1. Perform chemical cleaning Work when air temperature is 40 degrees F or above and is predicted to remain so for at least seven days after completion of cleaning.
 - 2. Do not perform chemical cleaning when air temperature is greater than 90 degrees F.
 - 3. Protect building and site features and personnel against wind-driven spread of cleaning materials. No cleaning should be performed when winds are sufficiently strong to spread cleaning materials to unprotected areas.
 - 4. Perform microabrasive cleaning within temperature ranges recommended by the manufacturer and when the air temperature is above 40 degrees F and predicted to remain so for at least seven days after completion of cleaning.
- E. Clean surfaces only during hours approved by Owner and in accordance with local codes and ordinances.
- F. Notify the COR immediately if conditions are uncovered that are not anticipated by the Construction Documents.
- G. Handle and use materials in strict accordance with safety requirements required by material manufacturer; Safety Data Sheets; and local,

state, and federal rules and regulations. Maintain MSDS with materials in storage area and available for ready reference on Site.

1.8 SEQUENCING AND SCHEDULING

- A. Perform cleaning work in the following sequence relative to other architectural precast work and brick masonry repair work:
 - 1. Inspect for open sealant joints cracks, facade deterioration, displacement spalls or similar anomalies. Repair before cleaning to prevent the intrusion of water and other cleaning materials into the wall. Notify the COR of any unusual conditions.
 - 2. Perform cleaning prior to precast concrete repairs and sealant replacement as required after cleaning.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Water for Prewetting, Cleaning, and Rinsing:
 - 1. Clean, potable water, with iron content of less than two (2) parts per million, or 0.0002 percent (by weight).
 - 2. Notify COR of any local water conditions that may make it unsuitable for cleaning, including but not limited to the presence of additives, water softeners, or other agents.
 - 3. Provide test results to confirm the local water is suitable for use in cleaning project.
 - 4. Where hot water is used in cleaning, heat water to a temperature of 120 degrees Fahrenheit.
- B. Mild detergents, surfactants, and chelating agents:
 - 1. Triton XL-80N: Volumetric mixture consisting of Triton X-80N detergent, a mild, non-ionic detergent, mixed with water, 0.1 to 3.0 percent detergent.
 - 2. Tri-sodium phosphate-type detergent: Volumetric mixture consisting of the trisodium phosphate-type detergent mixed with hot water to prepare liquid detergent; 2/3 cup detergent to 3 gallons water.
 - 3. EnviroKlean 2010 All Surface Cleaner, an alkaline cleaning liquid pH=10.5 at up to 1:10 dilution (volume/volume) based on test samples, as manufactured by Prosoco, Inc.
 - 4. Dumond Chemicals Safe 'n Easy Architectural Cleaner/Restorer, a non-ionic surfactant and cleating agent based cleaner, as manufactured by Dumond Chemicals, Inc.

5. MasonRE B, a surfactant, manufactured by Cathedral Stone Products, Inc.

C. One-part chemical cleaning systems:

1. SureKlean Limestone and Masonry Afterwash, an acidic liquid, pH=1.10 at 1:2 dilution (volume/volume), as manufactured by Prosoco, Inc. or COR approved equal.
2. SureKlean Light Duty Concrete Cleaner, an acidic liquid, pH=2-2.5, as manufactured by Prosoco, Inc.
3. COR approved equal

D. Two-part chemical cleaning systems:

1. Prewash: Prosoco SureKlean 766 Limestone & Masonry Prewash, an alkaline cleaning gel, pH=14 at undiluted concentration, followed by Afterwash: Prosoco SureKlean Limestone & Masonry Afterwash, an acidic liquid, pH=1.10 at 1:2 dilution (volume/volume).
2. Prewash: Prosoco SureKlean 766 Limestone & Masonry Prewash, an alkaline cleaning gel, pH=14 at undiluted concentration, followed by Afterwash: Prosoco SureKlean Light Duty Concrete Cleaner, an acidic liquid, pH=2-2.5.
3. COR approved equal

E. Biocide:

1. D/2 Biological Solution by D/2 Biological Solutions, Inc.
2. EnviroKlean, ReVive by Prosoco, Inc.
3. EnviroKlean ReKlaim, a two-part cleaning system (cleaner/activator) followed by Limestone and Masonry Afterwash by Prosoco, Inc.

F. Auxiliary Materials:

1. pH paper cable of measuring pH between 5 and 9
2. Wood or plastic scrapers.
3. Polyethylene sheets, 6 mils minimum thickness

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine areas to be cleaned for compliance with requirements of use of cleaning materials.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION AND PROTECTION

- A. Comply with all applicable safety codes and regulations that govern the work, including city, state, water department, OSHA, and Federal regulations covering protection and waste water disposal.
- B. Take any precautions necessary to insure the safety of pedestrians and those working in the building.
- C. Erect temporary protective covers over walkways and at points of pedestrian and vehicular entrance and exit that must remain in service during the course of the cleaning work.
- D. Comply with cleaning-material manufacturer's written instructions for protecting building and other surfaces against damage from exposure to its products.
 - 1. Prevent chemical cleaning solutions from coming into contact with pedestrians, motor vehicles, landscaping, buildings, and other surfaces that could be harmed by such contact.
 - 2. Cover adjacent surfaces with materials that are proven to resist chemical cleaners used unless chemical cleaners being used will not damage adjacent surfaces. Use materials that contain only waterproof, UV-resistant adhesives. Apply masking agents to comply with manufacturers' written instructions. Do not apply liquid masking agent to painted or porous surfaces. When no longer needed, promptly remove masking to prevent adhesive staining.
 - 3. Keep wall wet below area being cleaned to prevent streaking from runoff.
 - 4. Do not clean during winds of sufficient force to spread cleaning solutions to unprotected surfaces.
 - 5. Neutralize and collect alkaline and acid wastes for disposal off subject property.
 - 6. Dispose of runoff from cleaning operations by legal means and in a manner that prevents soil erosion, undermining of paving and foundations, damage to landscaping, and water penetration into building interiors.
- E. Protect people, workers, pedestrians, animals, plants, vehicles, property, and other non-concrete materials. The Work included herein includes the use of caustic and acidic chemicals that can harm the above-mentioned. Any damage caused by the cleaning operations shall be

the responsibility of the Contractor and shall result in no additional cost to the Owner.

- F. Protect windows, doors, finished flooring, metal fixtures, hardware, light fixtures, roofing materials and other non-concrete items. Protect with polyethylene before application.
- G. Protection from cleaning systems shall be by one of the methods below:
 - 1. Polyethylene sheets, no less than 6 mil thick, taped around the entire opening to provide an impervious barrier to the chemical cleaning process. Backing for the polyethylene sheets may be necessary to secure the sheets and provide a wind-proof, watertight system.
 - 2. An approved strippable mask of sufficient thickness and applied without bubbles, holes, or defects to adequately protect the surface underneath.
 - 3. Other protection as proposed by the Contractor and approved by the COR to provide an impervious barrier.
- H. Repair any building materials that have been damaged, where paint has been removed, glass that has been etched, or materials otherwise damaged by the cleaning work to the satisfaction of the COR without additional cost to the Owner.
- I. Remove all protection materials carefully and thoroughly. Protection materials shall not damage or leave residue on surfaces. Materials to which protection was attached shall be left in the same condition as that previous to the cleaning operations.
- J. Protect paving and sidewalk from staining or damage by the cleaning operations. Protect the joints to prevent water from penetrating the basement. Repair damaged paving or sidewalk without any additional cost to the Owner.
- K. Exercise caution in performing the work so as not to damage building elements from mechanical damage due to the scaffolding, other equipment, and the cleaning operations. If any building elements are damaged by the execution of the work, repair the damaged elements at no additional cost to the Owner.
- L. Surface and Air Temperatures
Do not apply when temperature is below freezing or will be overnight. If freezing conditions exist before application, let the surface thaw.

3.3 CLEANING ARCHITECTURAL PRECAST, GENERAL

- A. The purpose of the cleaning process is to remove atmospheric deposits, soil, staining, biological growth, grease, oil, and other contaminants without damage to or disintegration of the architectural precast concrete surface.
- B. The result of the cleaning is not expected to return the facade to a 100 percent clean or new appearance. The level of cleaning shall be as approved in the mockups as specified herein.
- C. The cleaning system shall not damage, etch, burn, bleach, streak, or discolor the architectural precast concrete surface or glaze.
- D. It is recognized that variations of the cleaning materials and their application may be required as the job proceeds. However, no variation will be acceptable without written approval of the COR. Notify the COR if any conflict is encountered between the specifications and the manufacturer's recommendations for the cleaning product or system.
- E. Proceed with cleaning in an orderly manner; work from top to bottom of each scaffold width and from one end of each elevation to the other.
- F. Use only those cleaning methods and materials indicated for each architectural precast concrete material and location.
 - 1. Do not use wire brushes or scrapers. For chemical cleaning, use only brushes that are resistant to chemical cleaners being used.
 - 2. Use spray equipment that provides controlled application at volume and pressure indicated, measured at spray tip. All pressure applicators shall be equipped with pressure gauges at the compressor and at the spray nozzle. Adjust pressure and volume to ensure that cleaning methods do not damage architectural precast.
 - 3. For chemical cleaner spray application, use low-pressure tank or chemical pump suitable for chemical cleaner indicated, equipped with cone-shaped spray tip, or other pump as recommended by manufacturer of cleaner. Control wind drift of chemical cleaners if spray application is used.
 - 4. For heated water spray application, use equipment capable of maintaining temperature at 120 degrees Fahrenheit at flow rates indicated.
- G. Perform each cleaning method indicated in a manner that results in uniform coverage of all surfaces, including corners, moldings, and

interstices, and that produces an even effect without streaking or damaging architectural precast surfaces.

- H. Preliminary Cleaning: Before beginning general cleaning, remove extraneous substances that are resistant to cleaning methods being used, as determined by test samples. Extraneous substances include sealant, asphalt, and tar.
 - 1. Carefully remove heavy accumulations of material from surface of architectural precast with a wood scraper. Do not scratch or chip architectural precast surface.
 - 2. If required, remove asphalt and tar with appropriate chemical cleaner approved in writing by the Architect/Engineer.
- I. Chemical Cleaner Application Methods: Apply chemical cleaners to architectural precast surfaces to comply with chemical cleaner manufacturer's written instructions; use brush or spray application methods, at Contractor's option. Do not spray apply at pressures exceeding 50 psi, or less as determined by mockups. Do not allow chemicals to remain on surface for periods longer than those indicated or recommended by manufacturer.
- J. Water Spray Applications: Unless otherwise indicated, hold spray nozzle at least 12 inches from surface of architectural precast and apply water in horizontal back and forth sweeping motion, overlapping previous strokes to produce uniform coverage.
- K. Prewetting and Rinsing Procedures:
 - 1. Prewetting shall be performed at very low water pressures (measured at the tip), and rinsing shall be performed at low pressures (measured at the tip), using warm water at a flow rate of not less than four gallons per minute. If approved in trial samples and mockups, hot water may be used to improve effectiveness of cleaning and rinsing. Do not use higher prewetting or rinsing pressures, or lower flow rates, unless indicated by approved trial samples and mock-ups.
 - 2. For prewetting, only apply cleaning chemicals to area that remains wet immediately at beginning of cleaner application. On hot days or in direct sunlight, it may be necessary to proceed with prewetting and cleaner application to small areas of surface, or to prewet the surface several times during the cleaner application.

3. For prewetting and rinsing, use a stainless steel spray trip giving a 45 degree fan spray, held at least 12 inches from the wall surface.
4. Rinse off chemical and soil residue and soil by working upward from bottom to top of each treated area at each stage or scaffold setting.
5. Continue rinsing until pH of wall has returned to neutral (6.5 to 7.5).
 - a. Maintain pH paper on site to check pH of rinsed surface.
 - b. Periodically during each rinse, test pH of rinse water running off of cleaned area to determine that chemical cleaner is completely removed.
 - c. Repeat application of neutralizing afterwash (if used) and rinsing as necessary to produce tested neutral pH (6.5 to 7.5).
6. Recheck pH of wall 48 hours after cleaning has been completed, when wall is dry.
- L. After cleaning is complete, remove protection no longer required. Remove tape and adhesive marks.
- M. Apply cleaning materials in strict compliance with the manufacturer's written instructions and as specified.

3.4 WATER CLEANING PROCEDURES

- A. Cold-Water Wash: Use cold water applied by low pressure spray.
- B. Cold Water Mist and Soak: Apply cold water by intermittent soaking. Use spray rack or perforated hoses or other means that will apply a fine water mist to entire surface being cleaned. Apply water in cycles with at least 30 minutes between cycles. Duration of application will be as determined by test samples. Continue water application until surface encrustation has softened sufficiently to permit its removal by water wash, as indicated by cleaning tests. Remove soil and softened surface encrustation from architectural precast concrete with cold water applied by low-pressure spray.
- C. Hot-Water Wash: Use hot water applied by low-pressure spray.
- D. Steam Cleaning: Apply steam at pressures note exceeding 80 psi.
- E. Washing equipment generating 400 to 800 psi with a water flow rate of 6 to 8 gallons per minute is the best water/pressure combination for rinsing porous surfaces. Use a 15 to 45 degree fan spray tip. Heated water (150 to 180 degrees F) may improve cleaning efficiency. Use

adjustable equipment for reducing water flow-rates and washing pressure as needed for sensitive surfaces.

- F. Washing pressures greater than 800 psi and fan spray tips smaller than 15 degrees may permanently damage sensitive surfaces.
- G. Maintain a constant water pressure, fan spray tip size, and distance from the wall. Move nozzle at a consistent rate and systematic manner for even cleaning of the substrate.

3.5 CHEMICAL CLEANING PROCEDURES

A. Dilution

- 1. The proper dilution of the chemical cleaner will be determined during mockups and trials. Always pour cold water into empty bucket first, then carefully add product. Never use hot water. Handle in polypropylene buckets only. Acidic materials and fumes attack metal.

B. Triton X-80N Cleaning:

- 1. Prewet wall surface with very low pressure water.
- 2. Apply cleaning solution with soft, natural bristle brush. Allow to dwell for 3 to 5 minutes. Dwell time to be confirmed by approved test samples.
- 3. Gently scrub surface with soft brush.
- 4. Rinse thoroughly with low-pressure warm water.

C. TSP Cleaning:

- 1. Prewet wall surface with very low pressure water.
- 2. Scrub on cleaning solution with soft, natural bristle brush. Allow to dwell for approximately 15 minutes. Dwell time to be confirmed by approved test samples. Keep surface moist by misting if necessary during dwell time.
- 3. Rinse thoroughly with low-pressure warm water. Agitate with scrubbing brush during rinsing. Rinse the wall with clean water until the pH of the surface has returned to neutral.

D. EnviroKlean 2010 Cleaning:

- 1. Prewet wall surface with very low pressure water.
- 2. Liberally apply diluted cleaning solution to the surface using a soft-bristled nylon brush, being careful to completely cover the surface of area, including crevices. Allow to dwell for 15 minutes. Dwell time to be confirmed by approved test samples.
- 3. On areas of cleaning exposed to wind or sunlight, monitor areas of work during dwell time to insure that applied cleaners do not dry on

the surface. Areas that being to dry should be lightly misted with water.

4. Just prior to rinsing, agitate surface again by scrubbing gently and thoroughly with a nylon bristle brush.
5. Rinse thoroughly with low-pressure warm water. Rinse the wall with clean water until the pH of the surface has returned to neutral.
6. Repeat cleaning sequence described above as necessary until cleaning standard established by approved samples is met.
7. The wall should be rinsed until the pH of the surface has returned to neutral. This may take a minimum of 5 minutes. A second rinse within an hour of the first for at least 2 additional minutes shall be performed to remove any cleaner residue. This second rinsing shall be performed with very low pressure water.
8. The pH of the wall surface shall be tested after final rinsing of cleaning solutions to confirm the pH of the surface has returned to neutral.

E. Dumond Chemicals Safe 'n Easy Architectural Cleaner/Restorer Cleaning:

1. Prewet wall surface with very low pressure water.
2. Scrub on cleaning solution using a soft, natural bristle brush. Allow to dwell for approximately 15 minutes. Dwell time to be confirmed by approved test samples.
3. Rinse thoroughly with low-pressure water. Agitate with scrubbing brush during rinsing.
4. Rinse the wall with clean water until the pH of the surface has returned to neutral.
5. Repeat cleaning sequence described above as necessary until cleaning standard established by approved samples is met.
6. The wall should be rinsed until the pH of the surface has returned to neutral. This may take a minimum of 5 minutes. A second rinse within an hour of the first for at least 2 additional minutes shall be performed to remove any cleaner residue. This second rinsing shall be performed with very low pressure water.
7. The pH of the wall surface shall be tested after final rinsing of cleaning solutions to confirm the pH of the surface has returned to neutral.

F. Cathedral Stone MasonRE B Cleaning:

1. Prewet wall surface with very low pressure water.

2. Apply a thick, even layer of cleaning solution to substrate, starting from the lowest level and working upward to build a thickness of 0.50 mils.
3. If gel begins to dry, another coat may be applied directly on top of first coat.
4. Agitate tough stains with stiff brush.
5. Allow to dwell for approximately 2 hours. Dwell time to be confirmed by approved test samples.
6. Rinse thoroughly with low-pressure warm water. Rinse the wall with clean water until the pH of the surface has returned to neutral and all of the cleaning agent and loose dirt are removed.

G. Prosoco SureKlean Limestone Afterwash Cleaning:

1. Prewet wall surface with very low pressure water.
2. Immediately apply diluted Afterwash to wet surface, using a natural dense-fibered brush. Allow to dwell for 5 minutes. Dwell time to be confirmed by approved test samples.
3. Rinse thoroughly with low-pressure warm water.
4. The pH of the wall surface shall be tested after final rinsing of cleaning solutions to confirm the pH of the surface has returned to neutral.

H. Light Duty Concrete Cleaner Cleaning:

1. Prewet wall surface with very low pressure water.
2. Dilute cleaning solution to achieve 1-part cleaner to 2-to-3 parts water, and in accordance with manufacturer's recommendations.
3. Apply diluted cleaning solution to pre-wet surface and allow to dwell for 3 to 5 minutes. Do not allow cleaner to dry on surface. Dwell time to be confirmed by approved test samples.
4. Re-apply cleaning solution and gently scrub surface with a soft brush, as recommended by the manufacturer.
5. Rinse thoroughly with low-pressure warm water. Continue rinsing until neutral pH is achieved at wall surface. Repeat application of cleaner and rinsing as necessary to achieve acceptable level of cleanliness in accordance with approved samples. Repeat rinsing as necessary to reach acceptable pH value.
6. The pH of the wall surface shall be tested after final rinsing of cleaning solutions to confirm the pH of the surface has returned to neutral.

I. Application of biocide:

1. Dry-brush with soft, nylon-bristle brush to remove dense biological growth.
2. Prewet surface thoroughly with low-pressure water.
3. Rinse surface growth from wall surface with low-pressure water rinse.
4. Liberally apply biocide with soft, nylon-bristle brush or sponge, being careful to completely cover surface, including crevices.
5. Allow to dwell for fifteen minutes. Keep surface moist by misting as necessary during dwell time.
6. Immediately prior to rinsing, gently scrub surface brush.
7. Rinse thoroughly to return pH to neutral.
8. Test pH of surface to confirm surface has returned to neutral.

J. Cleanup:

1. Clean tools and equipment using fresh water.

3.6 CLEAN UP

- A. The premises shall be kept in clean and orderly condition at all times during the progress of the work. Rubbish, barriers, dirt, debris, tools, equipment, and materials shall be removed from the site each day.
- B. The sidewalk and adjacent landscaping shall be thoroughly rinsed of all chemicals, dirt, pollutants, and other materials washed off the building each day.
- C. Remove all empty drums, cleaning materials, and related supplies from the site.
- D. After cleaning has been completed, remove any protection.

3.7 FIELD QUALITY CONTROL

- A. Allow COR use of available facade access means, as needed, to observe progress and quality of portion of the Work completed.
- B. Notify COR in advance of times when lift devices and scaffolding will be relocated. Do not relocate lift devices and scaffolding until architect/Engineer has had reasonable opportunity to make observations of work area at lift device or scaffold location.
- C. Cleaning materials
 1. Permit COR to collect samples of cleaning materials, if determined to be necessary by the COR. These samples may be laboratory tested

to insure that the products used in the cleaning process are the same as the materials, concentrations, and solutions approved.

2. Provide COR with access to the mix solution of the cleaning products at the site when requested by the COR.

D. Cleaning process

1. Permit COR to conduct tests on the cleaned and rinses precast concrete surface, if deemed necessary by the COR. Tests will be performed to determine if the Contractor is thoroughly rinsing the surface and removing all traces of the chemical cleaner. The pH value will be recorded before and after.
2. Re-rinse the affected area without any additional cost to the Owner if the COR determines that the masonry surfaces are not being sufficiently rinsed.
3. Re-clean the affected area without any additional cost to the Owner if the COR determines that the cleaning has not been satisfactorily implemented.

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Milwaukee VAMC
695-22-121 VAMKE Bldg 111 Façade Repair
Milwaukee, WI 53295

100% Bid Documents
March 16, 2026

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Section 03 01 31
CONCRETE REMOVAL AND SURFACE PREPARATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Concrete removal and surface preparation prior to concrete replacement or patching, including:
 - 1. Survey of architectural precast concrete surfaces to identify locations requiring repair.
 - 2. Removal of unsound and sound concrete, and unsound previous repairs.
 - 3. Examination and cleaning of all exposed steel reinforcement.
 - 4. Preparation of concrete and steel surfaces.
 - 5. Coating reinforcing bars and embedded steel with corrosion-inhibiting material.
 - 6. Supply and installation of supplemental epoxy-grouted dowels, reinforcing bars, and stainless steel pins, if necessary.
 - 7. Crack repair preparation
- B. Surface preparation is to be performed at all areas of existing precast concrete substrate to receive repair material.
- C. Contractor is to complete in-situ mockups of concrete removal and surface preparation for review and approval prior to the start of production work. Contractor is to provide access to COR to review work areas for evaluation of mockups and completed surface preparation as requested prior to placement of concrete.

1.2 RELATED WORK:

- A. SECTION 03 01 05 - CLEANING EXTERIOR FACADES
- B. SECTION 03 33 00 - ARCHITECTURAL CONCRETE REPAIRS

1.3 REFERENCES

- A. Reference Standards: Latest edition as of Specification date.
 - 1. ASTM International:
 - a. A193/A19M: Standard Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications.
 - b. A615: Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
 - c. A775/A775M: Standard Specification for Epoxy-Coated Steel Reinforcing Bars.
 - d. D3963/D3963M: Standard Specification for Fabrication and Jobsite Handling of Epoxy-Coated Reinforcing Steel Bars.

2. Concrete Reinforcing Steel Institute (CRSI):
 - a. Manual of Standard Practice.
3. International Concrete Repair Institute (ICRI):
 - a. Guideline 310.1R: Guide for Surface Preparation for the Repair of Deteriorated Concrete Resulting from Reinforcing Steel Corrosion.
 - b. Guideline 310.2R: Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays and Concrete Repair
 - c. Guideline 310.3R: Guide for the Preparation of Concrete Surfaces for Repair using Hydrodemolition Methods.
4. SSPC: The Society of Protective Coatings:
 - a. SSPC-SP 6/NACE No. 3: Commercial Blast Cleaning.
 - b. SSPC-SP 15: Commercial Grade Power Tool Cleaning.

1.4 COORDINATION

- A. Coordinate with COR and with other trades to ensure that adjacent areas are not adversely affected by concrete removal work.

1.5 SUBMITTALS

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Product Data: Manufacturer's literature and technical data for corrosion-inhibiting coating material, and epoxy for epoxy-grouted dowels, indicating applicability of product for proposed use.
 1. Include Safety Data Sheets (SDS) for information only.
- C. Shop Drawings: Placing drawings that detail fabrication, bending, and placement. Include bar schedules, sizes, and lengths; bent bar diagrams; bar arrangements, splices, laps, and mechanical connections; spacing of stirrups, hoops, ties, and supports; and material and grade.
- D. Epoxy-Coated Reinforcing Steel:
 1. Mill test reports for steel reinforcement, indicating conformance with ASTM A615/A615M.
 2. Certification from CRSI indicating that coating applicator is certified by CRSI Epoxy Plant Certification Program.
 3. Certification statement from coating applicator that material, coating process, and coating properties conform to ASTM A775/A775M, including preheat temperatures, cure times, thickness checks, holidays detected, and bend test results for each bar size.

- E. Confinement, Collection, and Disposal Plan: Written plan for confining, collecting, and disposing of broken concrete, sandblast grit, dust, debris, existing reinforcing, and other waste material resulting from removal operations and surface preparation.
- F. Protection Plan: Provide a protection plan for the work area that shows barricades, access, and other controls.

1.6 QUALITY ASSURANCE

- A. Contractor Qualifications: Engage an experienced concrete restoration firm to perform Work of this Section. Demonstrate that the firm has completed work similar in material, design, scope, size, and extent to that indicated for this Project with a record of successful in-service performance.
 - 1. Field Supervision: Maintain experienced full-time supervisors on Project site during times that removal and preparation work is in progress. Do not change supervisors during Project except for causes beyond the control of the Contractor.
 - 2. Workers: Minimum 2 years in related concrete restoration. Fully supervise apprentices with an experienced tradesperson.
- B. Qualifications for Installer of Epoxy-Grouted Dowels: Experienced individual with current ACI-CRSI certification as Adhesive Anchor Installer.
 - 1. Applicable only for anchors in horizontal or upwardly inclined orientations.
- C. Mockups: Demonstrate adequacy of concrete removal and surface preparation procedures as part of mockups in 03 33 00.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Site in original containers and packaging with seals unbroken, labeled with manufacturer's name, product brand name and type, date of manufacture, lot number, directions for storing, and complete manufacturer's written instructions.
- B. Keep materials dry and do not allow materials to be exposed to moisture during transportation, storage, handling, or installation. Reject and remove from Site new materials which have been exposed to moisture to their detriment.
- C. Store and handle materials in accordance with manufacturer's written instructions, safety requirements, and all applicable laws and regulations. Remove from Site, and replace at no cost to Owner, any

materials that are damaged or otherwise negatively affected by not being stored or handled in accordance with manufacturer's written instructions.

- D. Store materials in original, undamaged containers and packaging in clean, dry, location on raised platforms and protected from weather, within temperature range required by manufacturer. Protect stored materials from direct sunlight and sources of ignition. Manufacturer's standard packaging and covering alone is not considered adequate weather protection.
- E. Locate materials in a secure location approved by Owner's Representative
- F. Conspicuously mark damaged or opened containers, containers with contaminated materials, damaged materials, and materials that cannot be used within stated shelf life and remove from Site as soon as possible. Replace discarded materials in a timely manner at no cost to Owner.
- G. Limit stored materials on structures so as to preclude damage to materials and structures.
- H. Maintain copies of all applicable Safety Data Sheets (SDS) with materials in storage area, such that they are available for ready reference on Site.

1.8 PROJECT CONDITIONS

- A. Verify existing dimensions and details prior to start of concrete removal Work. Notify COR of conditions found to be different than those indicated in the Contract Documents. COR will review situation and inform Contractor and Installer how to proceed.
- B. Comply with COR's limitations and restrictions for Site use and accessibility.
- C. Dust, Fume, and Noise Controls:
 - 1. Confine dust and debris to Work area and prevent from entering portions of facility that remain in use.
 - 2. Direct equipment exhaust away from occupied spaces. Vent equipment operating within structure to outside or condition exhaust gases with catalytic converter.
 - 3. Operate equipment at noise levels conforming to requirements of city, state, and federal laws and codes, and Owner limitations.
- D. Handle and install materials in strict accordance with safety requirements required by material manufacturer; SDS; and local, state,

and federal rules and regulations. Maintain SDS with materials in storage area and available for ready reference on Site.

- E. Maintain adequate ventilation during preparation and application of materials.

1.9 MOCKUPS

- A. Contractor to complete mockups of concrete removal and surface preparation at a typical area of a minimum size of two (2) square feet for each concrete patch repair type, and four (4) linear feet for concrete crack repair. Mockups shall demonstrate all removal and cleaning procedures and methods, including cleaning of existing reinforcement. Each step of the removal and surface preparation procedure shall be reviewed by the COR as part of the mockup process.
- B. Field samples and mockups of surface preparation methods and techniques shall be completed and reviewed by the COR prior to start of production Work.
- C. Locations of field samples and mockups to be selected by Contractor and approved by COR.
- D. Adjust or repeat mockups as needed for COR approval. If approved, mockups can become part of the Work.
- E. Approved mockups shall be the standard of work for all removal and surface preparation on the project.

1.10 CHANGES IN WORK

- A. During rehabilitation work, existing conditions may be encountered which are not known or are at variance with the Contract Documents. Such conditions may interfere with the Work and may consist of damage or deterioration of the substrate or surrounding materials or improper location of embedded elements such as reinforcing steel, which could jeopardize the integrity or performance of the Work.
 - 1. Notify COR prior to proceeding with the Work of conditions that may interfere with, preclude proper execution of, or jeopardize the performance of the Work.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Corrosion-Inhibiting Coating Materials: Use material specifically intended for reinforcing steel embedded in concrete.
 - 1. Sika Armatec 110 EpoCem, manufactured by Sika Corporation or approved equal.

- B. Dowels: Stainless steel threaded rods and dowels: ASTM A193/A193M Type 304 stainless steel threaded rods. Stainless steel threaded rods and dowels are not to come into contact with any mild steel reinforcement or accessories.
- C. Reinforcing Bars: Deformed bars with 60,000 psi minimum yield strength conforming to ASTM A615/A615M, Grade 60. Sizes as shown on Drawings or directed by Architect/Engineer.
 - 1. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars in place. Bar supports shall be manufactured from steel wire, plastic, or precast concrete in accordance with "Bar Support Specifications and Standard Nomenclature" in CRSI Manual of Standard Practice.
 - a. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire bar supports or CRSI Class 2 stainless-steel bar supports.
- D. Grouted Dowels:
 - 1. Dowels: ASTM F593, Group 2 (Type 316) stainless steel; 1/4-inch-diameter, threaded rods.
 - 2. Grout for Dowels: Use one of the following or approved equal:
 - a. Sikadur 31 Hi-Mod Gel by Sika Corporation or approved equal.

2.2 FABRICATION

- A. Fabricate and detail steel reinforcement to shapes and dimensions shown on Drawings in accordance with and within fabricating tolerances shown in CRSI's Manual of Standard Practice.
- B. Bends and hooks shall conform to dimensions defined as "ACI Standard Hooks" in CRSI's Manual of Standard Practice unless otherwise shown on Drawings.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions for compliance with requirements and other conditions affecting concrete removal Work.
 - 1. Ensure that work done by other trades is complete and ready for concrete removal Work.
 - 2. Verify that areas and conditions under which concrete removal Work is to be performed permit proper and timely completion of Work.
 - 3. Notify COR in writing of conditions which may adversely affect concrete removal Work and recommend corrections.

4. Do not proceed with concrete removal Work until adverse conditions have been corrected and reviewed by COR.

5. Commencing concrete removal Work constitutes acceptance of Work surfaces and conditions.

3.2 PROTECTION

- A. Take precautions to ensure safety of people (including building users, passers-by, and workers) and protection of property (including adjacent building elements and landscaping).
- B. Coordinate demolition Work with other trades.
- C. Erect temporary protective canopies and walls, as necessary, at walkways and at points of pedestrian and vehicular access that must remain in service during Work.
- D. Take precautions to protect against air-borne materials and run-off.
- E. Protect paving, sidewalk, and adjacent building areas from mechanical damage due to scaffolding and other equipment.
- F. Prevent dust, debris, coating overspray/spatter, and other construction materials from coming into contact with pedestrians, landscaping, buildings, and other surfaces that could be harmed by such contact.
- G. Limit access to Work areas.
- H. Assume responsibility for injury to persons or damage to property due to Work, and remedy at no cost to Owner.
- I. Protect from damage, all elements of completed work and original construction to remain.

3.3 EQUIPMENT

- A. Pneumatic Chipping Hammers:
 - 1. Nominal 30-lb class or less for removal of concrete at repair areas.
 - 2. Nominal 15-lb class or less for detail work adjacent to and beneath reinforcing steel.
- B. Saws capable of sawcutting concrete to specified depth.
- C. Equipment capable of removing laitance, dirt, loose pieces of concrete, and surface contaminants from exposed concrete surfaces and rust, concrete, and surface contaminants from exposed steel surfaces.
- D. High-pressure, oil-free compressed air equipment capable of removing dust and dirt from exposed concrete removal areas.
- E. Percussive or rotary drilling equipment for making holes in concrete substrate for dowel installation.

- F. Abrasive blast equipment capable of properly cleaning and preparing the surface or other equipment to achieve a prepared surface.
- G. All equipment must operate at a noise level within the levels required by city, state, and federal laws and codes and COR requirements.
- H. Equipment operating within the structure must be fitted with a catalytic converter to condition the exhaust gases.

3.4 CONCRETE REMOVAL AND SURFACE PREPARATION

- A. Contractor shall sound concrete surfaces and identify the areas which require removal of unsound concrete. COR will review areas before concrete removal Work begins.
- B. Prior to any concrete removal work, the Contractor shall perform the following operations:
 - 1. Submit plan for confining, collecting, and disposing of broken concrete and other waste materials as a result of his removal operations. The building dumpsters are not to be used for this purpose.
 - 2. Remove or temporarily support plumbing lines and electrical conduits and fixtures, as necessary. All lines, conduits and fixtures shall be reattached at the completion of the work.
 - 3. Protect electrical fixtures, conduits, pipes, etc. from damage and overspray or runoff of repair materials.
 - 4. Notify the COR of the start date and location of the concrete repair work at least 48 hours prior to starting the work.
 - 5. Clean the windows and window frames at the completion of the Work to remove dust and concrete splatter, as well as any other debris caused by the Work.
- C. Sound concrete surfaces and mark all areas of unsound concrete. Architect/Engineer will review markings before concrete removal Work begins.
- D. Concrete Removal Areas:
 - 1. Where possible, make rectangular in shape in plan and elevation. The shape of each patch shall not be irregular. Angles between adjacent saw cuts around the perimeter of the patch shall not be less than 90 degrees.
 - 2. Avoid re-entrant corners.
 - 3. Extend at least two (2) inches beyond edge of unsound concrete.

- E. Create square edges of removal areas.
 - 1. Sawcut 3/4 inches at top surface removal areas. Do not saw through reinforcing steel, embedded electrical conduits, or other miscellaneous embedments.
 - 2. Chip or sawcut square edges of overhead and vertical removal areas at least 1/2 inches deep.
- F. Remove unsound concrete and, as necessary, sound concrete to create:
 - 1. A minimum removal depth of two (2) inches
 - 2. Gaps around partially exposed reinforcing bars (with greater than 50 percent of their circumference exposed) of at least 3/4 inches.
 - 3. Exercise care to avoid cracking underlying sound concrete, punching through members/panels, or damaging embedments.
 - 4. Avoid abrupt changes in depth of removal.
 - 5. Leave roughened surface to match CSP 7 or higher from ICRI 310.2R. Meet replacement material manufacturer requirement if greater than value specified here.
 - 6. Limit chipping hammer size and impact angle to minimize damage to sound concrete. Impact angle shall be no more than 60 degrees to surface.
- G. Contractor to take care not to cut or damage existing reinforcement during the sawcutting or concrete removal operations. Contractor to notify COR immediately if existing reinforcement was cut or damaged during concrete removal operations.
- H. During all concrete removal (chipping) process, great care shall be exercised to avoid cracking of the underlying sound concrete or vibrating exposed reinforcing steel.
- I. Inspect and sound concrete surfaces in and around removal areas. Remove additional unsound concrete. Sawcut or chip square new removal area perimeter as necessary.
- J. Clean surfaces of removal area, including vertical edges, to remove surface contaminants, loose pieces of concrete, and concrete that is bruised or micro-fractured and to roughen surfaces. Clean removal area surfaces with dry, oil-free compressed-air jet. Acceptable cleaning methods include:
 - 1. Abrasive blasting. If wet abrasive blasting is used a corrosion inhibitor shall be added to the water.

2. High-pressure water blasting. Pressures exceeding 5,000 psi, or as necessary to meet the requirements above.
- K. The newly exposed sound concrete shall be cleaned by mechanical abrasion followed by cleaning with a clean, dry compressed air blasting. The saw cut edges around the perimeter of the patch area shall be thoroughly cleaned and in accordance with repair material manufacturer's written requirements. Original adjacent concrete shall be protected from any damage from cleaning operations or air blasting of repair areas.
- L. Any areas of the prepared surface contaminated by oil or other materials detrimental to the bond of the new concrete as a result of the Contractor's operations shall be removed. Such cleaning or removal work will be paid for by the Contractor.
- M. Inspect prepared concrete surfaces and remedy defects. Allow COR at least 48 hours to observe prepared surfaces prior to patch placement.
- N. If more than 48 hours has elapsed since the patch area was abrasive cleaned and cleaned with high pressure compressed air at the point in time when the patch material is to be placed, then the patch area must be blown clean again with high pressure compressed air immediately prior to placement of the patch material.
- O. No removal of concrete by means of mechanical impact shall proceed following the placement of repair concrete until 48 hours of curing has elapsed, unless otherwise approved by the COR.
- P. At full-depth removal areas, slope removal area edges downward and inward at a slope of one to one.

3.5 REINFORCEMENT PREPARATION

- A. Leave existing reinforcing in place unless otherwise directed by COR.
- B. Notify COR of reinforcing bars that are incorrectly located or have less than 1/2 inch of concrete cover; are damaged or fractured; or have lost more than ten percent of their original cross-sectional area at any point. COR will determine remedial action.
- C. All exposed reinforcing bars and steel embedments shall be thoroughly abrasively cleaned to remove all rust and concrete. Prepare exposed steel surfaces, including existing exposed reinforcement and steel embedments. Use one of the following methods:
1. Abrasive blast, to SSPC-SP 6/NACE No. 3 finish, with minimal rust or concrete debris.

2. Commercial grade power tool cleaning, to SSPC-SP 15 at locations explicitly approved by COR in writing. Prepare to condition of minimal rust or concrete debris.
- D. Clean steel surfaces with dry, oil-free compressed-air jet. Exercise care to clean undersides of reinforcing bars.
- E. Inspect prepared steel surfaces and clean remaining contaminants. Allow COR 48 hours to observe prepared surfaces prior to coating steel.
 1. Reinforcing bars that are damaged or that have lost more than 20 percent of their original cross-sectional area at any point shall be brought to the attention of the COR for inspection. The COR will determine if the bars should be removed and replaced, or if supplemental reinforcing bars should be added.
 2. Where portions of reinforcing bars are exposed, the COR will determine if the embedded portion of the bar is soundly bonded to the remaining concrete. If, in the COR's judgment, the bar is not soundly bonded, the Contractor shall remove concrete around and under a length as determined by the COR.
 3. If during removal of unsound concrete, the Contractor encounters existing reinforcing bars with less than 1/2 inch cover from the existing concrete surface he shall notify the COR before repairs.
- F. The Contractor shall, at no time, cut or remove existing reinforcing steel without the prior approval of the COR.
- G. Apply two coats of corrosion-inhibiting material on exposed steel surfaces.
 1. Batch, mix, and apply material according to recommendations of material supplier.
 - a. Minimum dry film thickness: 10 to 12 mils.
 2. Exercise care to coat difficult-to-reach surfaces, such as undersides of reinforcing bars.
 3. Minimize spillage on concrete surfaces. Remove materials that will act as bond breaker by chipping or other means.
 4. Inspect coated steel surfaces and apply additional coats to uncoated or thinly coated areas. Allow COR at least 24 hours to observe prepared coated surfaces prior to patch placement.
- H. Install supplemental reinforcement as directed by COR.
 1. Remove additional sound concrete to properly position bars with minimum clear concrete cover of 1 1/2 inches and full encasement by

the replacement material; and to achieve specified lap splice length with existing bars. Coat new bars in accordance with the requirements of this section.

2. Do not weld reinforcement unless specifically approved by COR.
3. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

3.6 INSTALLATION OF EPOXY-GROUTED STEEL DOWELS

- A. Remove and replace unsound concrete at dowel locations.
- B. Dry drill holes perpendicular to concrete surface.
 1. Locate existing reinforcement with reinforcing bar locator and position holes to avoid existing reinforcement.
 2. Do not damage existing reinforcement.
 3. Drill hole diameter at least 1/8 inch larger than dowel diameter, unless otherwise recommended by epoxy manufacturer.
- C. Clean holes with stiff brush and dry, oil-free compressed-air jet to remove loose concrete, dust, and debris.
- D. Partially fill the hole with epoxy and insert the dowel or bar such that epoxy is forced out of the hole. The method of installation is intended to achieve 100 percent filling of the annular space between the reinforcing bar or dowel and the drilled hole. Dowels and bars shall be dry and free from contaminants. The epoxy shall be installed in accordance with the manufacturer's recommendations.
- E. Insert dowel to bottom of hole and secure in center of hole, perpendicular to surface, until epoxy has set.
- F. Promptly remove excess epoxy.
- G. Apply two coats of corrosion-inhibiting material on exposed steel surfaces.

3.7 SURFACE PREPARATION FOR CRACK REPAIR

- A. At locations identified by COR, repair cracks 15 mil or greater with sealant or grout. Clean cracks with stiff brush and dry, oil-free compressed-air jet to remove loose concrete, dust, and debris. Clean holes in strict accordance with manufacturer's instructions.
- B. Remove previous repair material and other foreign material from crack. Remove laitance and form-release agents from concrete.
- C. Remove loose particles remaining after cleaning operations by vacuuming or blowing out joints with oil-free, compressed air.
- D. Cleaning solvents must not be used on the concrete.

- E. Crack routing for sealant repair: Inspect surfaces adjacent to crack to receive repair material. Rout out crack with a V-shaped grinder to approximately 1/4 inch wide. If deteriorated, route a V-groove section at the crack face until sound concrete is reached. Clean substrate of foreign materials.
- F. Preparation for crack repair with grout: Inspect surface adjacent to crack to receive repair material. Clean and prepare per manufacturer's instructions.

3.8 QUALITY CONTROL

- A. Provide access to COR to survey each repair location to verify areas of Work. COR to verify areas of repair Work with Contractor prior to start of removal and surface preparation.
- B. Provide access to COR to observe completed demolition and surface preparation during Work for conformance with project documents and approved mockups. Coordinate access with COR.
- C. Work identified by COR not in conformance with project documents to be corrected prior to proceeding with concrete placement.

3.9 CLEANING

- A. After completing Concrete Removal and Surface Preparation Work:
 - 1. Clean all materials resulting from Work that are not intended to be part of the finished Work using appropriate cleaning agents and procedures. Exercise care to avoid damaging surfaces.
 - 2. Repair, at no cost to Owner, all items damaged during the Work.
 - 3. Remove and legally dispose of concrete and steel debris, sandblast materials, and surplus materials from Site.

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SECTION 03 33 00
ARCHITECTURAL CONCRETE REPAIRS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Supply and placement of concrete patch repair material for exposed aggregate finish architectural precast concrete wall panels to match adjacent original architectural concrete.
2. Concrete crack repair.

1.2 RELATED WORK:

1. SECTION 03 01 05 - CLEANING EXTERIOR FACADES
2. SECTION 03 01 31 - CONCRETE REMOVAL AND SURFACE PREPARATION
3. SECTION 06 10 00 - ROUGH CARPENTRY
4. SECTION 07 19 00 - WATER REPELLENTS
5. SECTION 07 92 00 - JOINT SEALANTS

1.3 REFERENCES

A. American Society for Testing and Materials (ASTM International)

1. ASTM C31: Practice for Making and Curing Concrete Test Specimens in the Field
2. ASTM C33: Specification for Concrete Aggregates
3. ASTM C39: Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
4. ASTM C42: Standard Test Method of Obtaining and Testing Drilled Cores and Sawed Beams of Concrete
5. ASTM C94: Standard Specification for Ready-Mixed Concrete
6. ASTM C150: Specification for Portland Cement
7. ASTM C231: Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.

B. American Concrete Institute (ACI)

1. ACI 117: Specification for Tolerances for Concrete Construction and Materials and Commentary.
2. ACI 211.1: Recommended Practice for Selecting Proportions for Normal and Heavyweight Concrete.
3. ACI 303.1: Standard Specifications for Cast-in-Place Architectural Concrete
4. ACI 305R: Recommended Practice for Hot Weather Concreting
5. ACI 306R: Recommended Practice for Cold Weather Concreting

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate Work to ensure that adjacent areas are not adversely affected. Coordinate:
 - 1. With COR's Representative.
 - 2. With other trades:
 - a. To ensure that work done by other trades is complete and ready for concrete patching Work.
 - b. To avoid or minimize work on, or in immediate vicinity of, concrete patching Work in progress.
 - c. To ensure that subsequent Work will not adversely affect completed concrete patching.
- B. Pre-placement Meeting:
 - 1. Conduct meeting at Site.
 - 2. Review requirements for concrete repair Work, including:
 - a. Construction schedule.
 - b. Availability of materials, personnel, equipment, and facilities needed to make progress and avoid delays.
 - c. Site use, access, staging, and set-up location limitations.
 - d. Coordination with other trades.
 - e. Forecast weather conditions.
 - f. Concrete removal, surface preparation, and substrate condition.
 - g. Placement procedures.
 - h. Special details.
 - i. Minimum cure period.
 - j. Testing and inspection requirements.
 - k. Temporary protection and repair of damaged concrete patches.
 - l. Structural loading limitations of deck.
 - m. Government regulations.
 - 3. Contractor and COR Representatives shall attend.

1.5 SUBMITTALS

- A. Submittal Procedures: Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Submit product data for proprietary concrete patching materials, corrosion protective bar coatings, dowels and bars, epoxy for epoxy-grouted dowels and bars, and any other accessories or associates products and materials. This should include Manufacturer's literature including written instructions for evaluating, preparing, and treating

substrate; technical data including tested physical and performance properties; and mixing and application or placement instructions.

1. Include temperature ranges for storage and application of materials, and special cold-weather application requirements or limitations.

2. Include Safety Data Sheets (SDS) for information only.

C. Design Mixes: For each concrete patch repair material mix, including required test reports.

1. Proportions of materials and written description of proposed batching and mixing methods for concrete to be used.

2. Mill test certificates for cement and fly ash.

3. Sieve analysis for fine and coarse aggregate.

4. Test results for deleterious substances in aggregates and potential aggregate reactivity.

5. Slump during laboratory tests.

6. Air content during laboratory tests.

7. 3-day, 7-day, and 28-day laboratory compression test results. Minimum 3 cylinders at each test age.

8. Indicate:

- a. Amount of mix water to be withheld for later addition at Site.

- b. Range of high-range, water-reducing admixture dosage that may be added at Site without adversely affecting hardened concrete.

D. Samples: The Contractor shall prepare at least three panels measuring at least 8 inches by 8 inches demonstrating proposed mix designs and finishing techniques to match existing exposed aggregate finish, for review and selection by COR. If none of the sample panels provide a suitable match to the existing architectural precast concrete, prepare additional samples for COR review.

E. After the sample panels are approved, one mockup concrete repair installation with exposed aggregate finish to match existing shall be performed on the building.

1. Location for mockup to be selected in consultation with the COR.

2. Perform preparation work as specified in Section 03 01 31. Allow for review of preparation work by COR before proceeding with concrete placement.

3. Allow new concrete to cure minimum 14 days prior to review and approval of mockup.

4. The COR-approved mockups shall be the standard for acceptance of the repair installation for the project.
5. Unacceptable mockups shall be removed. Preparation work shall be re-performed at the mockup location, and new mockups installed, at no cost to the Owner.
6. Protect mockups in place for the remainder of the work.
7. Upon completion, approved mockups may remain as part of the work.

1.6 QUALITY ASSURANCE

- A. Qualifications: Experienced firm that has successfully completed concrete patching Work similar in material, design, and extent to that indicated for the Project. Contractor shall provide at least five (5) representative, successfully-completed projects of similar scope/size.
 1. Employ foreman with a minimum of five (5) years of experience as foreman on similar project, to be on Site at all times during the Work. Do not change foreman during the course of the Project except for reasons beyond the control of the Contactor. Inform the COR of any changes in advance.
- B. Ready-Mix Supplier Qualifications: ASTM C94/C94M; Certification of Production Facilities and Delivery Vehicles by National Ready Mixed Concrete Association.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle materials according to manufacturer's recommendations and in such manner as to prevent damage to materials and structure.
- B. If concrete is to be site-batched:
 1. Store materials in dry condition and protect from dirt, dust, and other contaminants.
 2. Store cement bags on pallets.
 3. Store aggregate stockpiles in manner to avoid segregation or contamination with foreign matter or other aggregates. Store away from normal drainage paths and cover with canvas or plastic if necessary to keep dry.
- C. For proprietary materials:
 1. Deliver materials to Site in original bags and containers with seals unbroken, labeled with manufacturer's name, product brand name and type, date of manufacture, lot number, and directions for storing and mixing with other components.

2. Keep materials dry and do not allow materials to be exposed to moisture during transportation, storage, handling, and installation. Reject and remove from Site new materials which exhibit evidence of moisture during application, or have been exposed to moisture.
3. Store materials in original, undamaged bags or containers in clean, dry, protected location on raised platforms with weather-protective coverings, within temperature range required by manufacturer. Manufacturer's standard packaging and covering is not considered adequate weather protection.
- D. Limit stored materials on structures to safe loading capacity of structure at time materials are stored, and to avoid permanent deck deflection.
- E. Conspicuously mark damaged or opened bags or containers or bags or containers with contaminated materials, and remove from Site as soon as possible.
- F. Remove and replace materials that cannot be applied within stated shelf life.

1.8 PROJECT CONDITIONS

- A. Verify existing dimensions and details prior to start of concrete patching Work. Notify COR of conditions found to be different than those indicated in Contract Documents. COR will review situation and inform Contractor of changes.
- B. Comply with COR's limitations and restrictions for Site use and accessibility.
- C. Handle and place materials in strict accordance with safety requirements required by material manufacturers; SDS; and local, state, and federal rules and regulations. Maintain SDS with materials in storage area and available for ready reference on Site.

1.9 CHANGES IN WORK

- A. During rehabilitation Work, existing conditions may be encountered which are not known or are at variance with Contract Documents. Such conditions may interfere with Work and may consist of damage or deterioration of substrate or surrounding materials that could jeopardize integrity or performance of Work.
 1. Notify COR of conditions that may interfere with proper execution of the Work or jeopardize performance of Work prior to proceeding with Work.

PART 2 - PRODUCTS

2.1 CONCRETE TYPES, STRENGTHS, AND USES

- A. The concrete compressive strength is to be minimum 4,000 psi at 28 days.

2.2 MATERIALS

- A. White Portland cement, ASTM C150, Type I. Type III Portland Cement is not permitted.
- B. Gray Portland cement, ASTM C150, Type I. Type III Portland Cement is not permitted.
- C. Calcium chloride, lime, and plaster of Paris (gypsum) shall not be permitted as additives in the repair concrete.
- D. Fine and coarse aggregates for normal weight concrete shall conform to ASTM C33 and shall consist of sand and gravel or crushed stone. Aggregate particles shall be clean, hard, tough, durable, of uniform quality, and free from soft, thin elongated pieces, disintegrated stone, dirt, organic, or other injurious materials occurring either free or as a coating. Aggregates must be supplied from a source approved by the COR. Aggregate gradation shall conform to ASTM C33 with the following limitations:
 - 1. Minimum percentages of coarse aggregate by weight of total aggregate shall be 55 percent.
 - 2. Coarse aggregate gradation shall conform to gradation size number 7 (5/8 inch maximum).
- E. Water shall be potable, clean and free of deleterious quantities of substances known to be harmful to portland cement.
- F. Proprietary mortar for filling holes in sound concrete - SikaTop 123, manufactured by Sika USA, or approved equal.
- G. Surface retarder: Chemical liquid set retarder for application on form-facing materials, capable of temporarily delaying final hardening of newly placed concrete to expose aggregate to match existing facade texture (to be as used and approved in mock-up).

2.3 MATERIAL STORAGE

- A. All mix materials to be stored in moisture-tight containers until use. Prevent cross-contamination of material.

2.4 REPAIR CONCRETE MIX DESIGN

- A. One type of concrete mix and finishing is required to match the finishes on the exposed aggregate architectural precast concrete panels existing on the building.
 - 1. Mix No. 1: Rough exposed aggregate finish; original aggregate exposure produced with use of surface retarder (aggregate predominant mix)
- B. The primary requirements for the repair concrete are matching the appearance of the existing architectural concrete; workability that facilitates placement and the achievement of the desired finish; and proper finishing and curing practices to ensure achievement of low permeability and high durability.
- C. Water-cement ratio to be 0.45 maximum.
- D. Entrained air content to be 6 percent, plus or minus 1.5 percent.
- E. Gap-graded mix is required for both mix designs.
- F. Mix designs proposed for use, when tested in the laboratory as required in Chapter 5 of ACI 318, shall have an average 28-day compressive strength in excess of minimum design strength specified herein.

2.5 TESTING OF CONCRETE MIX DESIGNS

- A. The Contractor shall submit a list of all proposed materials, and material sources, to the COR at the initiation of the project. The following data shall be submitted to the COR:
 - 1. Sieve analysis for the fine and coarse aggregate
 - 2. Proposed mixing methods
 - 3. Mill certificates from the cement supplier
 - 4. List of materials and sources
- B. During the construction, tests will be made by an approved testing laboratory to determine if the concrete complies with the quality specified. The Contractor shall cooperate in the making of such tests to the extent of allowing free access to the work for the selection of samples and providing storage of the specimens, and in affording protection to specimens against injury or loss through his operations. The Contractor shall furnish all concrete for testing.
- C. Each cylinder is to be labeled to identify the date the cylinder was made and the location at which the tested concrete was being installed.

2.6 CRACK REPAIR MATERIAL

- A. General: See Section 07 92 00 (Joint Sealants).

1. Comply with ASTM C920 and other requirements indicated.
2. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer, based on testing on similar projects, mockups and preconstruction testing for Project, and field experience.
3. Source Limitations: Obtain each type of joint sealant through one source from single manufacturer.
4. Alternate crack repair material, where approved by COR: Pre-bagged proprietary repair mortar. Use SIKATOP 123 Plus, manufactured by the Sika Corporation or approved equal.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions for compliance with requirements and other conditions affecting installation or performance of concrete patches.
 1. Ensure that work done by other trades is complete and ready for concrete patching Work.
 2. Verify that areas and conditions under which concrete patching Work is to be performed permit proper and timely completion of Work.
 3. Notify COR in writing of conditions which may adversely affect installation or performance of concrete patches and recommend corrections.
 4. Do not proceed with concrete patching Work until adverse conditions have been corrected and reviewed by COR.
 5. Commencing concrete patching Work constitutes acceptance of Work surfaces and conditions.
- B. Examine substrates and conditions for compliance with to 03 01 31 - CONCRETE REMOVAL AND SURFACE PREPARATION

3.2 PROTECTION

- A. Take precautions to ensure safety of people, including building users, passers-by, and workmen, and animals, and protection of property, including adjacent building elements, landscaping, and motor vehicles.
- B. Prevent construction debris and other materials from coming into contact with pedestrians, motor vehicles, landscaping, buildings, and other surfaces that could be harmed by such contact.

- C. Protect adjacent building areas from mechanical damage due to scaffolding and other equipment.
- D. Limit access to Work areas.
- E. Erect temporary protective canopies, as necessary, over walkways and at points of pedestrian and vehicular access that must remain in service during Work.
- F. Assume responsibility for injury to persons or damage to property due to Work, and remedy at no cost to COR.

3.3 FORMWORK

- A. All patches shall be formed in conformance with ACI 347.
- B. The Contractor shall be responsible for the design and construction of all formwork.
- C. Forms for surfaces exposed to view shall be constructed of new 5/8 in. or 3/4 in., 5-ply structural plywood of concrete-form grade. Plywood may be reused for formed surfaces exposed to view as long as it is in good condition.
- D. Forms shall conform to the shape, lines, profile, and dimensions of existing members.
- E. Forms shall be braced and tied together to maintain their positions and shapes during the placement of concrete. Supports shall be spaced sufficiently close to prevent excessive deflection of the form material.
- F. As necessary, the formwork shall be securely fastened to the structure. The method of attachment is subject to the review and approval of the COR prior to the start of construction. All portions of the anchors that will remain in place should be recessed 1/2 inch back from the exposed concrete surface, and the recessed hole should be filled with mortar after the removal of the loose components of the anchorage device. All devices used to anchor formwork to the existing concrete members shall be stainless steel, drilled-in anchors, subject to the approval of the COR prior to use. Samples should be submitted to the COR for each type of anchor proposed for use.
- G. Special care shall be taken to obtain a seal between existing concrete construction and forms such that bleeding at form edges is held to a minimum, and clean straight lines are left after stripping forms.

- H. Wood forms used with latex-modified concrete shall first be coated with two coats of shellac or polyurethane varnish on the surface(s) exposed to concrete. No form release agents shall be used on the forms.
- I. Forms may be removed when field-cured cylinders achieve 75 percent of the specified 28-day compressive strength. It shall be the responsibility of the Contractor to make and pay for the costs of supplemental strength tests.
- J. Forms shall be readily removable without hammering, prying or damage to concrete. Metal tools shall not come in contact with concrete surfaces during form removal. All exposed concrete corners shall be finished to match existing corners. Form holes shall be filled with mortar to match existing concrete.
- K. The Contractor shall be responsible for seeing that no pieces of formwork become dislodged from the side of the building. The Contractor shall bear full responsibility for any injuries and/or property damage that may result should any pieces of formwork fall from the building.
- L. Coat contact surfaces of forms with surface retarder, according to manufacturer's recommendations and in accordance with mock-up.

3.4 BATCHING AND MIXING

- A. Site-batched concrete
 - 1. All materials shall be stored in a dry condition and protected from dirt, dust, and other contaminants. Cement bags shall be stored on pallets. Fine and coarse aggregates shall be stored away from normal drainage paths, and shall be covered with canvas or plastic as necessary. The outside bulk storage of latex modifier in the sunlight shall be limited to 10 days or as required by the manufacturer's specifications if more stringent. The latex modifier shall not be exposed to temperature extremes. The latex modifier shall be agitated as required by the manufacturer.
 - 2. All batching and mixing operations shall be developed in a manner such that quality control is guaranteed, accurate mix proportions are maintained and all ingredients are combined and mixed to a uniform consistency.
 - 3. All site-batched concrete is to be mixed at ground level and hoisted to the installation location.
 - 4. Site-batched concrete shall be batched by weight on the basis of whole bags of cement. The Contractor shall maintain a calibrated

scale at the site at all times during concrete placing operations. Batching by volume is permitted if the weight-volume relationship for each material is verified on a daily basis.

5. The Contractor shall designate one or two individuals as qualified to batch and mix the concrete. These individuals shall be fully instructed in the specific mix design proportions and shall have full responsibility for achieving the design mix. No other persons shall batch or mix concrete without prior notification to the COR.
 6. A sufficient number of mixers shall be provided, including reserve mixers, such that the concreting operations will proceed uninterrupted and the concrete is placed in a timely manner before initial set.
- B. Air-entraining and chemical admixtures, when used, shall be incorporated into the mix in amounts and manner recommended by the manufacturer and approved by the COR. Accuracy of measurement of any admixture shall be within plus or minus 3 percent. Two or more admixtures may be used in the same concrete provided such admixtures are added separately and that the combination is compatible and has no deleterious effect on the concrete.
- C. Water may be added to the latex-modified concrete to obtain slump within the prescribed limits. Latex concrete with a slump less than 3 inches may be rejected if it is not placed satisfactorily and with a closed tight surface.
- D. No concrete shall be placed at temperatures lower than 40°F or when the temperature is projected to fall below 40°F within 24 hours following placement. If heated water or aggregates are used, the water shall be combined with the aggregates in the mixer before cement is added. Cement shall not be added to mixtures of water and aggregate when the temperature of the mixture exceeds 70°F.
- E. At temperatures above 85°F, the COR may require placements to be made at night or in early morning if, in his opinion, a satisfactory placement is not being achieved. The temperature of the concrete, when discharged, shall not exceed 90°F. The Contractor is cautioned that difficulty may be encountered with concrete at temperatures approaching 90°F and every effort should be made to maintain it at lower temperatures.

3.5 CONCRETE PLACEMENT

- A. Installation of formwork, reinforcement, and embedded items is complete. Refer to Section 03 01 31 - CONCRETE REMOVAL AND SURFACE PREPARATION.
- B. Before placing concrete, all equipment for mixing and transporting concrete shall be cleaned; vibrators shall be checked for workability; all frost, ice, mud, debris, and water shall be removed from concrete surfaces and forms; forms shall be thoroughly wetted or oiled; and reinforcement shall be securely tied in place and thoroughly cleaned of ice and other coatings which may destroy or reduce bonding with concrete. No concrete shall be placed until the COR has approved the forms and the condition and placement of reinforcement.
- C. Conveying the concrete from the mixer to the place of deposit shall not cause separation or loss of materials.
- D. Placing of concrete shall be such that it shall be deposited as nearly as possible to its final position to avoid segregation due to rehandling or flowing. Placing shall be at such a rate that at all times concrete shall be plastic and flow readily into corners of forms and into spaces between rebars. No concrete that has partially hardened or has been contaminated by foreign materials shall be deposited. When concreting is commenced, it shall be carried on as a continuous operation until the panel or section is completed. When being deposited, concrete shall not be allowed to fall a vertical distance greater than 4 feet from point of discharge to point of deposit.
- E. Concrete placement shall not disturb or displace reinforcing bars, or other slab embedments.
- F. All newly placed concrete shall be consolidated by means of vibration. Generally, vibration shall be accomplished by means of an internal vibrator running at a minimum speed of 7,000 rpm or higher, depending on the nature of the concrete being consolidated. Extra vibrators shall be kept at the project site to be used in case a vibrator does not work. Vibrators shall be as narrow as necessary for shallow work.

3.6 CURING

- A. Normal weight concrete patches shall be maintained above 40°F and in a moist condition for at least the first 7 days after placing. Latex-

modified concrete patches shall be maintained above 40°F and in a moist condition for at least the first 24 hours after placing.

- B. Adequate protection shall be provided for concrete during freezing or near freezing weather. Placement and curing of concrete during cold weather shall conform to the requirements of ACI 306R.
- C. Placement and curing of concrete during hot weather shall conform to the requirements of ACI 305R.
- D. Protect newly placed concrete from damage due to rain.

3.7 PROPRIETARY CONCRETES AND MORTARS

- A. Use only products allowed and approved by COR.
- B. Mix, apply, finish and cure proprietary materials in accordance with the manufacturer's recommendations, except where in conflict with these specifications.
- C. All patches are to be formed and cast. No concrete repair material is to be trowel-applied. No concrete repair material is to be installed in lifts. Repair mortar may be trowelled only to fill holes.

3.8 FIELD QUALITY CONTROL

- A. Testing of Concrete (both mixes indicated above)
 - 1. At the beginning of the project prior to placing of any concrete, at least five standard 4 in. by 8 in. cylinders will be made for each mix, cured, and tested in accordance with ASTM C31 and ASTM C39, except as noted herein. The second set of testing will be performed after one week of concrete work. The frequency of further testing is to COR's discretion, which will depend on the results obtain from initial testing and second testing.
 - 2. All cylinders shall be tested by a qualified approved testing laboratory which meets the requirements of ASTM E329, and their reports sent to the COR and the Contractor. Costs for these tests will be paid for by the Owner. The Contractor or Testing Lab will be responsible for making these cylinders and for seeing that they are transmitted to a testing laboratory. The Contractor shall provide the necessary concrete to make the cylinders.
 - 3. All five cylinders shall be cured under field conditions for one day. The cylinders shall then be transported to the testing agency laboratory and cured in air at 73 + or - 3 degrees F, 100 percent relative humidity. Two cylinders shall be tested for compressive

strength at 7 days and two at 28 days. One cylinder shall be stored for potential future testing.

4. For each set of cylinders made, a slump and air content test shall also be made from the same batch of concrete used to make the cylinders. The temperature of the concrete shall be taken at the same time cylinders are made. Slump tests shall be made in accordance with ASTM C143. Air content tests shall be made in accordance with ASTM C231.
5. Testing of cylinders shall be in accordance with ASTM C39, and shall be conducted by the Owner's testing agency. Each test report shall contain the following information for each set of cylinders:
 6. Individual test specimen strength, type of failure
 7. Slump
 8. Concrete and air temperature
 9. Specimen number
 10. Portion of structure represented by the concrete tested
 11. Date cast
 12. Date tested
 13. Concrete properties specified
 14. Notice if tests indicate concrete is not in conformance with specifications
 15. Strength shall be considered satisfactory if the average of the two 28-day tests meets or exceeds 4,000 psi, and neither of the 28-day tests is below 3,500 psi.
- B. Contractor shall sound test all repair work after sufficient cure time to detect delaminations and debonded areas within the repair area. All delaminated or debonded areas shall be removed, re-prepared, and replaced at no cost to the Owner.

3.9 CONCRETE CRACK REPAIR

- A. Crack Repair with Sealant:
 1. Do not apply crack repair materials if the temperature of the concrete is not within the range of application temperatures recommended by the manufacturer.
 2. Provide dry substrate; prevent wetting of substrate prior to sealant installation.
 3. Apply masking along sides of the crack prior to installation of sealant to reduce excess.

4. Install sealant in two lifts. Install the first lift into the prepared crack and tool to concave profile. Install second lift and tool flush.
5. Remove and clean excess sealant from sides of crack on concrete.

B. Crack Repair with Grout:

1. Install grout at prepared crack locations per manufacturer's recommendations including surface preparation.
2. Remove and clean excess grout from sides of crack on concrete.

3.10 CLEANING

- A. At end of each workday, clean Site and Work areas and place rubbish, empty cans, rags, and other discarded materials in appropriate containers.
- B. After completing concrete patching Work:
 1. Clean soiling from adjacent surfaces. Exercise care to avoid scratching or damage to surfaces.
 2. Repair surfaces stained, marred, or otherwise damaged during concrete patching Work.
 3. Clean up debris and surplus materials and remove from Site.

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**SECTION 04 01 00
MAINTENANCE OF MASONRY**

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

Localized brick masonry repair at areas of new brick (rebuilding of brick veneer adjacent to and along the full height of precast concrete panels).

1.2 RELATED WORK

A. Section 04 05 13 - MASONRY MORTARING.

B. Section 04 20 00 - UNIT MASONRY.

1.3 APPLICABLE PUBLICATIONS

A. Comply with references to extent specified in this section.

B. ASTM International (ASTM):

C67/C67M-20.....Sampling and Testing Brick and Structural Clay
Tile.

C144-18.....Aggregate for Masonry Mortar.

C150/C150M-20.....Specification for Portland Cement.

C207-18.....Hydrated Lime for Masonry Purposes

C216-19.....Facing Brick (Solid Masonry Units Made from Clay
or Shale)

C270-19a1.....Mortar for Unit Masonry

C295/C295M-19.....Petrographic Examination of Aggregates for
Concrete

C. Brick Industry Association (BIA)

1. BIA Technical Notes 1 - All-Weather Construction

2. BIA Technical Note 7B - Water Resistance of Brick Masonry -
Construction and Workmanship

D. American Concrete Institute (ACI)

ACI 530.1/ASCE 6/TMS 602 Specification for Masonry Structures.

1.4 SUBMITTALS

A. Submittal Procedures: Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA,
AND SAMPLES.

B. Manufacturer's Literature and Data:

1. Description of each product.

2. Replacement units indicating manufacturer recommendation for each
application.

C. Samples - before erecting mockup, submit samples of the following:

1. Each type of specified masonry wall tie.
2. Each type of specified masonry repair anchor.
3. Pointing Mortar: Cured, 6 inches long for each type, texture, and color.
4. Furnish no less than five (5) individual brick for three (3) potential brick unit types selected by the Contractor. The five (5) bricks shall show extremes of variation in color and texture. After two (2) potential brick types have been approved by the Owner and Architect/Engineer, mockups are to be construction in accordance with Section 1.5.

D. Test reports:

1. Preconstruction test results of existing masonry mortar and units.
2. Recommended mortar mix and mortar materials sources.

E. Restoration Program:

1. For each phase of the restoration process, provide detailed description of materials, methods, equipment, and sequence of operations to be used including protection of surrounding materials on the building and project site.

1.5 QUALITY ASSURANCE

A. Contractor Qualifications:

1. Documentation and demonstration of experience in completed work similar in design, material, and extent specified.
 - a. Field Supervision: maintain experienced full-time supervisors on project site during times that masonry restoration is in progress. Do not change supervisors during project except for causes beyond the control of the Contractor.
 - b. Workers and installers: minimum two (2) years of experience in related masonry construction. Fully supervise apprentices with an experienced tradesperson.

B. Preconstruction Testing:

1. Existing Brick: according to ASTM C67.
2. Existing Mortar: according to ASTM C295/C295M.
 - a. Recommend mortar mix compatible with existing and mortar material sources required to match existing color and finish.

- C. Mockups: Prepare mockup in size and location as determined by COR, demonstrating quality and appearance of pointing, unit replacement, and cleaning.

1.6 DELIVERY

- A. Deliver masonry units to the site strapped together in suitable packs or pallets, or heavy-duty cartons.
- B. Deliver other materials to the site in the manufacturer's original and unopened containers.
- C. Mark packaging, legibly. Indicate manufacturer's name or brand, type, color, and manufacture date.
- D. Before installation, return or dispose of products within distorted, damaged, or opened packaging.

1.7 STORAGE AND HANDLING

- A. Store materials covered, protected from weather, and elevated above grade to prevent damage
 - 1. Prevent contamination of aggregates.
- B. Protect products from damage during handling and construction operations.

1.8 FIELD CONDITIONS

- A. Environment:
 - 1. Repair masonry only when air temperature is between 40 and 90 deg F and is predicted to remain so for at least seven (7) days after completion of work.
 - 2. Cold Weather Requirements: When air temperature is below 40 deg F, suspend the Work or comply with the requirements of ACI 530.1/ASCE 6/TMS 602, BIA Technical Note 1, section on "Cold Weather Construction".
 - 3. Hot Weather Requirements: When the ambient air temperature exceeds 100 degrees f or exceeds 90 deg F with a wind velocity greater than 8 miles per hour, suspend the Work or comply with the requirements of ACI 530.1/ASCE 6/TMS 602 and BIA Technical Note 1, section on "Hot Weather Construction". -

1.9 WARRANTY

- A. Construction Warranty: FAR clause 52.246-21, "Warranty of Construction."

1.10 SEQUENCING AND SCHEDULING

- A. Order replacement materials at the earliest possible date to avoid delaying completion of the Work.

B. Perform masonry restoration work in the following sequence:

1. Repair existing masonry, including replacing the existing masonry with new masonry materials.
2. Rake out joints that are to be pointed.
3. Cut out joints that are to be repointing as specified in Section 04 21 10.
4. Point mortar joint as specified in Section 04 21 10.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Face Brick, Building Brick and Accessories: As specified in Section 04 20 00.
- B. Mortar Components: Type N as specified in Section 04 05 13.

2.2 BRICK AND CONCRETE MASONRY REPAIR MATERIALS

A. Brick Masonry Veneer Ties.

1. Stainless steel ties: All components - Type 304 stainless steel.
Supply appropriate assemblies for varying cavity or collar joint conditions. Use one of the following products or an approved equal.
 - a. Adjustable Speed Set Veneer-Tie, supplied by Prosoco, Inc.
 - b. 315 Flexible Dovetail Brick Tie (stainless steel), supplied by Hohmann & Barnard, Inc.
 - c. Aggre-Gator (1/4 inch diameter) bi-metal tapping screws, supplied by DeWalt Fasteners and Anchors, Inc. (for use with brick ties).
 - d. Wall ties (Steel Backup): Ties at areas of brick replacement (exterior wythe) with steel backup: Pos-I-Tie, supplied by Heckmann Building Products, Inc. All components are to be hot-dip galvanized steel. Supply appropriate assemblies for varying cavity or collar joint conditions.

2.3 CLEANERS TO REMOVE MORTAR AND DEBRIS FROM REPAIR WORK

A. Cleaning Solution

1. "Enviro Klean Safety Klean, as manufactured by Prosoco, Inc. or Architect/Engineer approved equal
 - a. Solution: Dilute cleaning solution with water at ratios to be discussed with Architect/Engineer.
2. DO NOT use products containing the following:
 - a. Hydrochloric (muriatic) acid
 - b. Hydrofluoric acid
 - c. Ammonium bifluoride

B. Clean, potable water

- C. Soft, natural bristle brush or roller
 - 1. For acidic cleaners use nylon bristle brushes
 - 2. For neutral or alkaline cleaners, use natural bristle brushes.
- D. Pressure rinsing equipment that can provide controlled application of heated water
 - 1. Allowable pressure: 400-600 psi, or as approved during cleaning mockups
 - 2. Water flow rate: 4 to 8 gallons per minute
 - 3. Water may be heated to 185 degrees F to assist in improving cleaning
 - 4. Use 15-40 degree stainless steel fan tips
- E. Equipment shall have no ferrous partsMortar Components: Type N as specified in Section 04 05 13.
 - 1. Aggregate: ASTM C144.
 - 2. Portland Cement: ASTM C150/C150M, Type I.
 - 3. Water: Potable, free of substances that are detrimental to grout, masonry, and metal.

2.4 PRODUCTS - GENERAL: NOT USED

2.5 REPLACEMENT MASONRY UNITS: NOT USED

2.6 ACCESSORIES: NOT USED

PART 3 - EXECUTION

3.1 PROTECTION AND PREPARATION

- A. Examine and verify substrate suitability for product installation.
- B. Protect persons, motor vehicles, surrounding surfaces of building being restored, building site, plants, and surrounding buildings from harm resulting from Work.
 - 1. Erect temporary protective covers over walkways and at points of pedestrian and vehicular entrance and exit that will remain in service during course of Work.
- C. Remove existing fixtures and fittings concealing masonry joints to permit repointing and repair.
- D. Prevent mortar from staining face of surrounding masonry and other surfaces.
 - 1. Cover sills, ledges, roof area, mechanical equipment, and protections to protect from mortar droppings.
 - 2. Keep wall area wet below Work area to discourage mortar from adhering.

3. Immediately remove mortar in contact with exposed masonry and other surfaces.

3.2 PREPARATION: NOT USED

3.3 EXISTING MORTAR JOINTS: NOT USED

3.4 TUCK POINTING: NOT USED

3.5 MASONRY UNIT REMOVAL AND REPLACEMENT

- A. At locations indicated on the Drawings and as designated by the Architect/Engineer, remove bricks that are cracked, spalled, displaced, or deteriorated. Perform brick removal also at areas where required to perform inner wythe and substrate wall repairs. Prior to beginning the Work, notify the Owner's Representative and the Architect/Engineer of locations with damaged or deteriorated brick that are not indicated for repair in the Contract Documents.
 1. Carefully demolish and remove entire units and mortar from joint to joint, without damaging the surrounding masonry, in a manner that permits replacement with full-size units. Remove and replace sound bricks that are damaged during the Work at no cost to the Owner.
- B. Support and protect remaining masonry that surrounds removal area. Maintain flashings, reinforcement, lintels, and adjoining construction in an undamaged condition.
- C. Notify Architect/Engineer of unforeseen detrimental conditions including voids, cracks, bulges, displacements, and loose masonry units in existing masonry backup, rotted wood, corroded metal, and other deteriorated items.
- D. Cover openings and partially completed Work with strong waterproofing membrane at the end of the day, or when the Work is not in progress. Extend the cover at least 2 feet beyond the opening edges and secure in place.
- E. Clean bricks surrounding removal areas by removing mortar, dust, and loose particles in preparation for replacement.
- F. Brick Masonry Installation
 1. Install brick in accordance with BIA Technical Note 7B and NCMA TEK Note 3-8A in the bonding and coursing pattern of the existing brick.
 2. If cutting is required, use a motor-driven saw designed to cut masonry with clean, sharp, unchipped edges.

3. Lay the replacement masonry as plumb and true to line as the adjacent surfaces will permit; new brickwork shall be flush with the existing.
4. Lay the replacement brick with completely filled bed, head, and collar joints. Do not deeply furrow the bed joints. Butter the ends with sufficient mortar to fill the head joints, and shove into place. Lay replacement concrete masonry with face shell bedding.
5. Maintain the joint width for the replacement units to match the existing joints.
 - a. Tool the exposed mortar joints in the repair areas when the mortar is thumbprint hard, with a round jointer slightly larger than the width of the joint. Tool the joints to match the joints in the surrounding existing brickwork.
6. Do not pound the corners and jambs to fit stretcher units after they are set in position. Where an adjustment must be made after the masonry has been placed, remove and replace the mortar.
7. Install mortar at the top and ends of the repair by packing layers of mortar into the joint with a tuckpointer's tool.
8. Install veneer ties 16 inch on center horizontally and vertically typically, and 8 inch on center around the perimeter of the repair. Embed the ties 3/4 inch minimum and 1-3/4 inch maximum from the exterior face of the veneer, in the mid-thickness of the joint.
9. Install weep vents, a maximum of 24 inch on center, in the head joints in the first course immediately above the flashing. Keep the weepholes free of mortar droppings.
10. Keep the wall cavity (collar joint) free of mortar. Back bevel bed joints down toward the cavity to prevent mortar from extruding into the cavity when the units are placed.

3.6 IF THE BRICK PLACEMENT IS STOPPED WHILE IN PROGRESS, EITHER AT THE END OF THE DAY OR FOR SOME OTHER REASON, STOP HORIZONTAL RUNS BY RACKING BACK THE MORTAR OF EACH COURSE ONE HALF UNIT LENGTH; DO NOT TERMINATE IN A VERTICAL TOOTH PATTERN. ANCHORING

- A. Anchor new exterior brick veneer to new and existing walls or members with wall ties as shown on the Drawings and specified below
- B. Space wall ties at 16 inches on center each way with a minimum of 1 tie per rebuild location. One half spaces shall be used at the top or bottom of any wall section and at any ends.

- C. Embed metal ties to a distance between the end of the tie and the exterior face of the new brick veneer of 3/4 in. minimum and 1 3/4 in. Maximum
- D. Locate metal ties in the middle of the thickness of the horizontal mortar joints of the brick veneer.

3.7 JOINT TOOLING

- A. Tool joints at areas of replaced masonry when mortar becomes slightly hardened.
- B. Produce smooth, concave joint to match existing.

3.8 CLEANING

- A. Remove mortar splatter from exposed surfaces immediately.
- B. Clean repairs areas 24 to 48 hours after completion of the Work. This Work is for staining and debris from repair work.
 - 1. Remove large particles of mortar from exposed masonry surfaces with wood paddles or scrapers. Do not use metal scrapers or brushes unless approved by the Architect/Engineer.
 - 2. Saturate the brickwork with water and flush off loose mortar and dirt. With a stiff-fiber brush, scrub with cleaning solution. Thoroughly wash off the cleaning solution, dirt, and mortar crumbs with clean, low-pressure water.
 - 3. For the removal of rust stains, apply cleaning mixture with a trowel, and scrape off when dry. Repeat until the stain is removed, and wash thoroughly with water.
- C. Wash adjacent non-masonry surfaces. Use detergent and soft brushes or cloths. Clean masonry debris from the roof. Sweep and rake the adjacent pavement and grounds to remove masonry debris. Where necessary, pressure wash surfaces to remove mortar, dust, dirt, and stains. Remove scaffolding, equipment, surplus materials, debris, and refuse from the site.

3.9 FIELD QUALITY CONTROL

- A. A project representative of the Architect/Engineer will periodically observe the progress and quality of the Work. Notify the project representative of any field conditions that deviate from the repair details. Allow the project representative use of the scaffolding, as needed, to observe the progress and quality of the Work.
- B. Notify the Architect/Engineer in advance of times when a lift device or scaffolding will be relocated. Do not relocate the lift device or

scaffolding until the project representative has had reasonable opportunity to make observations of the work areas at the lift device or scaffold location.

- C. Material Testing: Tests may be requested by Owner or the Architect/Engineer after certification and delivery of the material. The cost of tests shall be paid by the Owner unless the test results indicate that material does not conform to the Specification requirements, in which case the Contractor shall pay the cost of testing.

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SECTION 04 05 13
MASONRY MORTARING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Preparation and mixing of mortar for setting and pointing new masonry face brick.
2. Pointing mortar joints between new and reinstalled/existing masonry units.

1.2 RELATED REQUIREMENTS

- A. Section 04 01 00 - MAINTENANCE OF MASONRY.
- B. Section 04 20 00 - UNIT MASONRY.

1.3 APPLICABLE PUBLICATIONS

- A. Except as modified by the Project Specifications, work shall comply with references specified in this section.
- B. ASTM International (ASTM):
 1. C144-11 -Aggregate for Masonry Mortar.
 2. C150/C150M-15 - Portland Cement.
 3. C207-06(2011) - Hydrated Lime for Masonry Purposes.
 4. C270-14a - Mortar of Unit Masonry.
 5. C780-15 - Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry.
- C. Brick Institute of America (BIA)
 1. BIA Technical Notes 7F - Moisture Resistance of Brick Masonry - Maintenance
 2. BIA Technical Notes 8A - Standard Specification for Portland Cement-Lime Mortar for Brick Masonry, BIA Designation M1

1.4 SUBMITTALS

- A. Submittal Procedures: Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Manufacturer's Literature and Data:
 1. Description of each product to be used in Work.
- C. Test Reports: Certify each product comply with specifications from an independent laboratory for all required tests.

- D. Material Certificates: Prior to delivery, submit to the Owner and Architect/Engineer certificates attesting to compliance with the applicable Specifications referenced herein of the following:
 - 1. Portland cement. Include brand, type, and name of manufacturer.
 - 2. Hydrated lime. Include brand, type, and name of manufacturer
 - 3. Aggregate. Include type, sieve analysis, and supplier.
 - 4. Color admixtures. Include brand, type, and name of manufacturer
 - 5. Preblended, dry mortar mixes. Include description of type and proportions of ingredients.
- E. Qualifications: Substantiate qualifications comply with specifications.
 - 1. Testing laboratory.

1.5 QUALITY ASSURANCE

- A. Construction Testing:
 - 1. Engage independent testing agency qualified according to ASTM C 1093 to perform tests indicated, as documented according to ASTM E 548 and submit reports.
 - a. Deliver samples to laboratory in number and quantity required for testing.
 - b. Mortar:
 - 1) Test for compressive strength and water retention according to ASTM C270.
 - 2) Minimum Mortar compressive strengths 28 days:
 - a) Type N: 750 psi.
- B. Contractor Qualifications:
 - 1. Contractor: Must have a minimum of five (5) years of experience in construction and supervision of masonry work.
 - 2. Masons: Must have a minimum of two (2) years of experience on construction of masonry.
- C. Field Quality Control: Work in place shall be subject to inspection testing. Work found to be unacceptable shall be replaced with new, acceptable work.

1.6 DELIVERY

- A. Deliver masonry units to the site strapped together in suitable packs or pallets, or heavy-duty cartons.
- B. Deliver other materials to the site in the manufacturer's original and unopened containers.

- C. Mark packaging, legibly. Indicate manufacturer's name or brand, type, color, and manufacture date.
- D. Before installation, return or dispose of products within distorted, damaged, or opened packaging.

1.7 STORAGE AND HANDLING

- A. Store materials covered, protected from weather, and elevated above grade to prevent damage
 - 1. Prevent contamination of aggregates.
- B. Protect products from damage during handling and construction operations.

1.8 FIELD CONDITIONS

- A. Environment:
 - 1. Repair masonry only when air temperature is between 40 and 90 deg F and is predicted to remain so for at least seven (7) days after completion of work.
 - 2. Cold Weather Requirements: When air temperature is below 40 deg F, suspend the Work or comply with the requirements of ACI 530.1/ASCE 6/TMS 602, BIA Technical Note 1, section on "Cold Weather Construction".
 - 3. Hot Weather Requirements: When the ambient air temperature exceeds 100 degrees f or exceeds 90 deg F with a wind velocity greater than 8 miles per hour, suspend the Work or comply with the requirements of ACI 530.1/ASCE 6/TMS 602 and BIA Technical Note 1, section on "Hot Weather Construction".

1.9 WARRANTY

- A. Construction Warranty: FAR clause 52.246-21, "Warranty of Construction."

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cementitious Materials (MASONRY CEMENTS WILL NOT BE ALLOWED)
 - 1. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.
 - 2. Hydrated Lime: ASTM C207, Type S
- B. Aggregates for Mortar
 - 1. ASTM C144 except that the grading shall comply with the limits specified in Section 4.3 of BIA M1. Sand shall contain no more than

50 parts per million of chloride ions. Sand shall be free of organic contaminants.

2. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.
3. For joints less than 1/4 inch thick, use aggregate graded with 100 percent passing the No. 16 sieve.
4. White-Mortar Aggregates: Natural white sand or crushed white stone.
5. Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.

C. Water

1. Clean and potable.
2. Free from deleterious amounts of acids, alkalis, or organic materials.

D. Admixtures

1. No admixtures shall be used without written approval, unless otherwise specified.
2. No calcium chloride or admixtures containing calcium chloride shall be used in the mortar.
3. No air-entraining admixtures or material containing air-entraining admixtures shall be used in the mortar.

E. Mortar Pigments

1. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes. Use only pigments with a record of satisfactory performance in masonry mortar.
2. Colored Cement Product: Packaged blend made from Portland cement and lime and mortar pigments, all complying with specified requirements, and containing no other ingredients.
 - a. Formulate blend as required to produce color indicated or, if not indicated, as selected from manufacturer's standard colors.
 - b. Pigments shall not exceed 10 percent of Portland cement by weight.

2.2 MORTAR MIXES

- A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures, unless otherwise indicated.
1. Do not use calcium chloride in mortar or grout.
 2. Limit cementitious materials in mortar to Portland cement and lime.

- B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a preblended mix. Measure quantities by weight to ensure accurate proportions and thoroughly blend ingredients before delivering to Project site.
 - 1. Portland Cement-Lime Mix: Packaged blend of Portland cement complying with ASTM C 150, Type I or Type III, and hydrated lime complying with ASTM C 207, Type S.
- C. Mortar for Unit Masonry: Comply with ASTM C 270, Property Specification. Provide the following types of mortar for applications stated unless another type is indicated.
 - 1. Tuckpointing mortar shall be prehydrated Type O.
- D. Color Matching:
 - 1. Match mortar color to existing adjacent mortar joints, unless specified otherwise.
 - 2. Pigmented Mortar: Use colored cement product containing only metallic oxides [or select and proportion pigments with other ingredients to produce color required. Do not add pigments to colored cement products].
 - 3. Pigments shall not exceed 10 percent of Portland cement by weight.
 - 4. Pigments containing carbon black shall not exceed 2 percent of Portland cement by weight.
- E. Colored-Aggregate Mortar: Produce required mortar color by using colored aggregates and natural color or white cement to produce required mortar color.

PART 3 - EXECUTION

3.1 PROTECTION AND PREPARATION

- A. Examine and verify substrate suitability for product installation.
- B. Protect persons, motor vehicles, surrounding surfaces of building being restored, building site, plants, and surrounding buildings from harm resulting from Work.
 - 1. Erect temporary protective covers over walkways and at points of pedestrian and vehicular entrance and exit that will remain in service during course of Work.
- C. Remove existing fixtures and fittings concealing masonry joints to permit repointing and repair.

- D. Prevent mortar from staining face of surrounding masonry and other surfaces.
 - 1. Cover sills, ledges, roof area, mechanical equipment, and protections to protect from mortar droppings.
 - 2. Keep wall area wet below Work area to discourage mortar from adhering.
 - 3. Immediately remove mortar in contact with exposed masonry and other surfaces.

3.2 MORTAR MIXING

- A. Except as specified herein, mix in accordance with requirements of BIA M1. Control batching procedure to insure proper proportions by measuring materials by volume with known volume containers. Do not measure mortar materials by shovels.
- B. Use Type N mortar proportion for re-pointing mortar mix.
- C. Rake out and repoint mortar joints to the following extent:
 - 1. All joints in areas indicated.
 - 2. Joints where mortar is missing or where they contain holes.
 - 3. Cracked joints where cracks can be penetrated at least 1/4 inch by a knife blade 0.027 inch thick.
 - 4. Cracked joints where cracks are 1/8 inch or more in width and of any depth.
- D. Rake out joints as follows:
 - 1. Remove mortar from joints to depth of 2 times joint width, but not less than 3/4 inch or not less than that required to expose sound, unweathered mortar. If unsound mortar extends more than 2 inches from the face of the units, work should not proceed and the Architect/Engineer should be contacted immediately.
 - 2. Remove mortar from masonry joint surfaces to provide reveals with square backs and to expose masonry for contact with pointing mortar. Brush, vacuum, or flush joints to remove dirt and loose debris.
 - 3. Do not spall edges of masonry units or widen joints. Replace damaged masonry units as directed by COR.
 - 4. Cut out center of mortar bed joints using angle grinders with diamond-impregnated metal blades. Remove remaining mortar by hand with chisel and mallet. Strictly adhere to written quality-control program. Quality-control program shall include provisions for demonstrating ability of operators to use tools without damaging

- masonry, supervising performance, and preventing damage due to worker fatigue.
- a. "Half moons" created by grinders in head joints will not be allowed.
5. All sealant joints at areas to be repointed are to be raked out during the mortar removal process. After repointing, these joints to be completely removed and replaced.
- E. Notify Architect/Engineer of unforeseen detrimental conditions including voids in mortar joints, cracks, loose masonry units, rotted wood, rusted metal, and other deteriorated items.
- F. Masonry units adjacent to the repair areas that are damaged during the Work shall be removed and replaced at Contractor's expense and to the acceptance of the Architect/Engineer and Owner.
- G. Repoint joints as follows:
1. Blow loose mortar out prepared joints with compressed air.
 2. Rinse masonry-joint surfaces with potable water to remove residual dust and mortar particles. Time rinsing application so, at time of pointing, joint surfaces are damp but free of standing water. If rinse water dries, dampen masonry-joint surfaces before pointing.
 3. Apply pointing mortar first to areas where existing mortar was removed to depths greater than surrounding areas. Apply in layers not greater than 1/4 inch until a uniform depth is formed. Fully compact each layer thoroughly and allow it to become thumbprint hard before applying next layer.
 4. After deeper areas have been filled to same depth as typical areas, point all joints by placing mortar in layers not greater than 1/4 inch. Fully compact each layer and allow to become thumbprint hard before applying next layer. Where existing masonry has worn or rounded edges, slightly recess finished mortar surface from face of masonry to avoid wider joints. Take care not to spread mortar over edges onto exposed masonry surfaces or to featheredge mortar.
 5. When mortar is thumbprint hard, tool joints to match original appearance of joints. Remove excess mortar from edge of joint by brushing.

- H. Cure mortar by maintaining in thoroughly damp condition for at least 72 hours including weekends and holidays.
 - 1. Acceptable curing methods include covering with wet burlap and plastic sheeting, periodic hand misting, and periodic mist spraying using system of pipes, mist heads, and timers.
 - 2. Adjust curing methods to ensure that pointing mortar is damp throughout its depth without eroding surface mortar.
- I. Where repointing work precedes entire building cleaning of existing masonry, allow mortar to cure at least 28 days before beginning entire overall building cleaning.

3.3 MORTAR INSTALLATION

- A. Install in accordance with BIA Standards.
- B. Use mortar within 2-1/2 hours of initial mixing. If stiff, mortar may be retempered.

3.4 CLEANING

- A. Wipe excess mortar from masonry surface adjacent to mortar joint with a damp sponge or cloth. Note: Use only sponges or cloth that is damp, not wet or saturated. When tightly squeezed water should not run from damp sponge or cloth. Surface of the masonry shall not have visible accumulation of water immediately following cleaning. Do not touch or disturb newly installed pointing mortar during cleaning. Clean until mortar and mortar haze is removed from adjacent masonry surfaces.
- B. Upon completion of repointing, thoroughly rinse surfaces of walls at repointed areas to remove dust and other surface residue from repointing process. Use only low pressure (less than 100 psi) water rinse. Rinse may be eliminated only with Architect/Engineer's approval.
- C. After mortar has fully cured, thoroughly clean exposed masonry surfaces of excess mortar and foreign matter; use wood scrapers, stiff-nylon or fiber brushes, and clean water, spray applied at low pressure.
 - 1. Do not use metal scrapers or brushes.
 - 2. Do not use acidic or alkaline cleaners unless specified herein or approved by COR.
- D. Wash adjacent woodwork and other non-masonry surfaces. Use detergent and soft brushes or cloths.

E. If mortar remains on the surface following repointing and initial clean-up the following procedure may be used if deemed necessary by the Architect/Engineer:

1. Apply cleaning agent to trial repair area to inspect its effectiveness and to determine any necessary revisions to cleaning procedures. The cleaning shall be performed in accordance with the following procedure:
2. Do not clean masonry work with chemicals prior to 72 hours after masonry work or repointing is completed.
3. Use specified cleaning solution in accordance with manufacturer's written recommendations.
4. Pre-wet areas of wall to be cleaned prior to installation of cleaning solution.
5. Do not allow cleaning solution to dry on the masonry
6. Remove large particles of mortar with wood paddles and scrapers before wetting the wall. Saturate the masonry with clean water and flush off all loose mortar and dirt. Scrub with a stiff fiber brush. Thoroughly wash off all cleaning solution, dirt and mortar crumbs using clean, low-pressure water.
7. Do not damage masonry.
8. Cleaning process shall be repeated as necessary.
9. Thoroughly rinse wall. When wall is nearing the drying point, check pH of wall with test paper. Continue to rise wall until pH is between 6 and 8.
10. Rinse water, pressures and equipment shall conform with Masonry Cleaning Section.

F. Clean masonry debris from roof; remove debris from gutters and downspouts. Rinse off roof and flush gutters and downspouts.

G. Sweep and rake adjacent pavement and grounds to remove masonry debris. Where necessary, pressure wash surfaces to remove mortar, dust, dirt, and stains.

3.5 FIELD QUALITY CONTROL

- A. Inspectors: Owner will engage qualified independent inspectors to perform inspections and prepare test reports. Allow inspectors use of lift devices and scaffolding, as needed, to perform inspections.
- B. Architect/Engineer's Project Representatives: Architect/Engineer will assign Project representatives to help carry out Architect/Engineer's

responsibilities at the site, including observing progress and quality of portion of the Work completed. Allow Architect/Engineer's Project representatives use of scaffolding, as needed, to observe progress and quality of portion of the Work completed.

- C. Notify Architect/Engineer's Project representatives in advance of times when lift devices and scaffolding will be relocated. Do not relocate lift devices and scaffolding until Architect/Engineer's Project representatives have had reasonable opportunity to make observations of work areas at lift device or scaffold location.

3.6 CLEAN UP

- A. At the conclusion of repointing, remove all scaffolding and equipment used in the Work. Clean all debris, refuse and surplus of material and remove same from premises.

3.7 FIELD QUALITY CONTROL: NOT USED

- - - E N D - - -

SECTION 04 06 10
MASONRY MORTAR

PART 1 GENERAL

1.1 SUMMARY

- A. This Section includes preparation and mixing of mortar for setting and pointing masonry items listed below:
 - 1. Face brick
 - 2. Concrete masonry units (CMU)
- B. Related Sections include the following:
 - 1. Section 04 12 10 - BRICK MASONRY REPAIR AND REPLACEMENT
 - 2. Section 04 20 00 - UNIT MASONRY
 - 3. Section 04 91 60 - REPOINTING WITH CEMENT-LIME MORTAR

1.2 REFERENCES

- A. Except as modified by the Project Specifications, applicable portions of the following reference standards shall govern the work. All standards latest edition as of the date of the Specifications:
 - 1. Mortar:
 - a. American Society for Testing and Materials (ASTM)
 - 1) C144 - Specifications for Aggregate for Masonry Mortar
 - 2) C150 - Specifications for Portland Cement
 - 3) C207 - Specifications for Hydrated Lime for Masonry Purposes
 - 4) C270 - Specifications for Mortar for Unit Masonry
 - 5) C780 - Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry
 - b. Brick Institute of America (BIA)
 - 1) BIA Technical Notes 7F - Moisture Resistance of Brick Masonry - Maintenance
 - 2) BIA Technical Notes 8A - Standard Specification for Portland Cement-Lime Mortar for Brick Masonry, BIA Designation M1

1.3 DEFINITIONS

- A. Original mortar: Mortar used in the original construction of the masonry wall
- B. Pointing: Installing new mortar into a properly prepared joint between masonry units.
- C. Repointing: Removal of the outer portion of existing masonry joints from between masonry units to a specified depth and installing new mortar as specified.

- D. Setting mortar: Mortar used in original construction to act as a leveling and bonding agent for the masonry units.

1.4 SUBMITTALS

- A. Product Data: Materials description for all materials to be used in Work.
- B. Material Certificates: Prior to delivery, submit to the Owner and Architect/Engineer certificates attesting to compliance with the applicable Specifications referenced herein of the following:
 - 1. Portland cement. Include brand, type, and name of manufacturer.
 - 2. Hydrated lime. Include brand, type, and name of manufacturer
 - 3. Aggregate. Include type, sieve analysis and supplier.
 - 4. Color admixtures. Include brand, type, and name of manufacturer
 - 5. Preblended, dry mortar mixes. Include description of type and proportions of ingredients.
- C. Test Reports: Test reports from an independent laboratory for all required tests.
- D. Mix Designs: For each type of mortar. Include description of type and proportions of ingredients.
 - 1. Include test reports, per ASTM C 780, for mortar mixes required to comply with property specification.

1.5 QUALITY ASSURANCE

- A. Testing Agency Qualifications: An independent agency qualified according to ASTM C 1093 for testing indicated, as documented according to ASTM E 548.
- B. Contractor Qualifications:
 - 1. Contractor: Must have a minimum of five (5) years' experience in construction and supervision of masonry work.
 - 2. Masons: Must have a minimum of two (2) years' experience on construction of masonry.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to the job site in manufacturer's sealed packaging and store unopened until required for use.
- B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

- D. Deliver preblended, dry mortar mix in moisture-resistant containers designed for lifting and emptying into dispensing silo. Store preblended, dry mortar mix in delivery containers on elevated platforms, under cover, and in a dry location or in a metal dispensing silo with weatherproof cover.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Cementitious Materials (MASONRY CEMENTS WILL NOT BE ALLOWED)
1. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.
 2. Hydrated Lime: ASTM C207, Type S
- B. Aggregates for Mortar
1. ASTM C144 except that the grading shall comply with the limits specified in Section 4.3 of BIA M1. Sand shall contain no more than 50 parts per million of chloride ions. Sand shall be free of organic contaminants.
 2. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.
 3. For joints less than 1/4 inch thick, use aggregate graded with 100 percent passing the No. 16 sieve.
 4. White-Mortar Aggregates: Natural white sand or crushed white stone.
 5. Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.
- C. Water
1. Clean and potable.
 2. Free from deleterious amounts of acids, alkalis or organic materials.
- D. Admixtures
1. No admixtures shall be used without written approval, unless otherwise specified.
 2. No calcium chloride or admixtures containing calcium chloride shall be used in the mortar.
 3. No air-entraining admixtures or material containing air-entraining admixtures shall be used in the mortar.
- E. Mortar Pigments

1. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes. Use only pigments with a record of satisfactory performance in masonry mortar.
2. Colored Cement Product: Packaged blend made from portland cement and lime and mortar pigments, all complying with specified requirements, and containing no other ingredients.
 - a. Formulate blend as required to produce color indicated or, if not indicated, as selected from manufacturer's standard colors.
 - b. Pigments shall not exceed 10 percent of portland cement by weight.

2.2 MORTAR MIXES

- A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures, unless otherwise indicated.
 1. Do not use calcium chloride in mortar or grout.
 2. Limit cementitious materials in mortar to portland cement and lime.
- B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.
 1. Portland Cement-Lime Mix: Packaged blend of portland cement complying with ASTM C 150, Type I or Type III, and hydrated lime complying with ASTM C 207, Type S.
- C. Mortar for Unit Masonry: Comply with ASTM C 270, Property Specification. Provide the following types of mortar for applications stated unless another type is indicated.
 1. For exterior, above-grade, non-load-bearing walls and parapets; use Type N.
 2. Tuckpointing mortar shall be prehydrated Type N.
- D. Color Matching:
 1. Match mortar color to existing adjacent mortar joints, unless specified otherwise.
- E. Pigmented Mortar: Use colored cement product containing only metallic oxides [or select and proportion pigments with other ingredients to produce color required. Do not add pigments to colored cement products].
 1. Pigments shall not exceed 10 percent of portland cement by weight.

2. Pigments containing carbon black shall not exceed 2 percent of portland cement by weight.

F. Colored-Aggregate Mortar: Produce required mortar color by using colored aggregates and natural color or white cement to produce required mortar color.

PART 3 EXECUTION

3.1 MORTAR MIXING

A. Except as specified herein, mix in accordance with requirements of BIA M1. Control batching procedure to insure proper proportions by measuring materials by volume with known volume containers. Do not measure mortar materials by shovels.

3.2 REPOINTING MORTAR MIXING

A. Use Type N mortar proportion for re-pointing mortar mix.

B. Pre-hydrate mortars thoroughly mixing all ingredients except water; then, mix again, adding only enough water to produce a damp unworkable mix which will retain its form when pressed into a ball. After keeping mortars in this dampened condition for 1 to 1-1/2 hours, add sufficient water to bring it to the proper consistency; that is, somewhat drier than conventional masonry mortars. Do not use mortar if more than 2-1/2 hours has elapsed since the initial mixing of the mortar.

3.3 MORTAR INSTALLATION

A. Install in accordance with BIA Standards.

B. Use mortar within 2-1/2 hours of initial mixing. If stiff, mortar may be retempered.

3.4 CLEANING

A. At the conclusion of masonry work remove all equipment and surplus material used for mixing mortar, clean up all debris and refuse and remove same from the site.

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SECTION 04 12 10
BRICK MASONRY REPAIR AND REPLACEMENT

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes removal and rebuilding of the brick masonry veneer at wall areas designated in the Drawings.
- B. Related Sections include the following:
 - 1. Section 03 01 05 - CLEANING EXTERIOR FACADES
 - 2. Section 04 06 10 - MASONRY MORTAR
 - 3. Section 04 20 00 - UNIT MASONRY
 - 4. Section 04 91 60 - REPOINTING WITH CEMENT-LIME MORTAR
 - 5. Section 07 19 00 - WATER REPELLENTS
 - 6. Section 07 27 26 - FLUID-APPLIED MEMBRANE AIR BARRIER, VP
 - 7. Section 07 60 00 - FLASHING AND SHEET METAL
 - 8. Section 07 92 00 - JOINT SEALANTS

1.2 REFERENCES

- A. Reference Standards: All standards latest edition as of the date of the Specification.
 - 1. American Society for Testing and Materials (ASTM)
 - a. C 67 - Test Methods of Sampling and Testing Brick and Structural Clay Tile
 - 2. Brick Industry Association (BIA)
 - a. BIA Technical Notes 1 - All-Weather Construction
 - b. BIA Technical Note 7B - Water Resistance of Brick Masonry - Construction and Workmanship
 - 3. American Concrete Institute (ACI)
 - a. ACI 530.1/ASCE 6/TMS 602 - Specification for Masonry Structures.
 - 4. American Concrete Institute (ACI)
 - a. ACI 530.1/ASCE 6/TMS 602 - Specification for Masonry Structures.

1.3 DEFINITIONS

- A. Pointing: Installing new mortar in an open or raked joint or raked between masonry units.
- B. Repointing: Removal of the outer portion of existing mortar joints to a specified depth and installing new mortar as specified.

1.4 SUBMITTALS

- A. Product Data: For each product listed in Part 2.

B. Samples: Before erecting mockup, submit samples of the following:

1. Each type of specified masonry wall tie
2. Each type of specified masonry repair anchor
3. Submit cured samples of mortar for approval of color and finish
4. Furnish not less than five individual bricks for three potential brick unit types selected by the Contractor. The five (5) bricks shall show extremes of variation in color and texture. After two potential brick types have been approved by the COR, mockup walls are to be constructed in accordance with Section 1.5.

C. Restoration Program:

1. For each phase of restoration process, provide detailed description of materials, methods, equipment, and sequence of operations to be used including protection of surrounding materials on building and Project site.

1.5 QUALITY ASSURANCE

A. Contractor Qualifications: Engage an experienced masonry restoration firm to perform work of this Section. Demonstrate that firm has completed work similar in material, design, and extent to that indicated for this Project with a record of successful in-service performance.

1. Field Supervision: maintain experienced full-time supervisors on Project site during times that masonry restoration is in progress. Do not change supervisors during Project except for causes beyond the control of Contractor.
2. Workers and installers: minimum 2-years experience in related masonry construction. Fully supervise apprentices with an experienced tradesperson.

B. Source Limitations: Obtain each type of material for masonry restoration from one source with resources to provide materials of consistent quality in appearance and physical properties.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle materials in such a manner as to prevent damage.
 - 1. Deliver masonry units to the site strapped together in suitable packs or pallets, or in heavy-duty cartons.
 - 2. Deliver other materials to the site in the manufacturer's original and unopened containers, labeled with the manufacturer's name and type of products, and store unopened until required for use.
- B. Store masonry units, accessories, and packaged materials on elevated platforms and protect from weather, moisture/condensation, and neglect. Comply with manufacturer's recommendations for minimum/maximum temperature requirements for storage. Remove damaged or otherwise unsuitable material from the site.

1.7 PROJECT CONDITIONS

- A. Repair masonry only when air temperature is between 40 and 90 deg F and is predicted to remain so for at least 7 days after completion of work.
- B. Cold-Weather Requirements: When air temperature is below 40 deg F, suspend the Work or comply with the requirements of ACI 530.1/ASCE 6/TMS 602, BIA Technical Note 1, section on "Cold Weather Construction".
- C. Hot-Weather Requirements for Masonry: When the ambient air temperature exceeds 100 degrees F, or exceeds 90 degrees F with a wind velocity greater than 8 miles per hour, suspend the Work or comply with the requirements of ACI 530.1/ASCE 6/TMS 602 and BIA Technical Note 1, section on "Hot Weather Construction".

1.8 SEQUENCING AND SCHEDULING

- A. Order replacement materials at earliest possible date to avoid delaying completion of the Work.
- B. Perform masonry restoration work in the following sequence:
 - 1. Repair existing masonry, including replacing existing masonry with new masonry materials.
 - 2. Rake out joints that are to be pointed.
 - 3. Cut out joints that are to be repointed as specified in Section 04 91 60.
 - 4. Point mortar joints as specified in Section 04 91 60.
- C. As scaffolding is removed, patch anchor holes used to attach scaffolding.

PART 2 PRODUCTS

2.1 MASONRY MATERIALS

- A. Face Brick, Building Brick and Accessories: As specified in Section 04 20 00 - Unit Masonry
- B. Mortar: Type N as specified in Section 04 06 10 - Masonry Mortar

2.2 BRICK AND CONCRETE MASONRY REPAIR MATERIALS

- A. Brick Masonry Veneer Ties.
 - 1. Stainless steel ties: All components - Type 304 stainless steel. Supply appropriate assemblies for varying cavity or collar joint conditions. Use one of the following products or an approved equal.
 - a. Adjustable Speed Set Veneer-Tie, supplied by Prosoco, Inc.
 - b. 315 Flexible Dovetail Brick Tie (stainless steel), supplied by Hohmann & Barnard, Inc. Attach to sound backup with Aggregator (1/4 inch diameter) bi-metal tapping screws, supplied by DeWalt Fasteners and Anchors, Inc. (for use with brick ties).
- B. Masonry Repair Anchors.
 - 1. Install at brick masonry or precast concrete panel locations designated in the Drawings or COR in the field during construction.
 - 2. Type 304 stainless steel Stitch-Tie helical pins, supplied by Prosoco, Inc. or an approved equal.

2.3 CLEANERS TO REMOVE MORTAR AND DEBRIS FROM REPAIR WORK

- A. Cleaning Solution
 - 1. "Enviro Klean Safety Klean, as manufactured by Prosoco, Inc. or approved equal.
 - a. Solution: Dilute cleaning solution with water at ratios to be discussed with COR.
 - 2. DO NOT use products containing the following:
 - a. Hydrochloric (muriatic) acid.
 - b. Hydrofluoric acid.
 - c. Ammonium bifluoride.
- B. Clean, potable water.
- C. Soft, natural bristle brush or roller.
 - 1. For acidic cleaners use nylon bristle brushes.
 - 2. For neutral or alkaline cleaners, use natural bristle brushes.

- D. Pressure rinsing equipment that can provide controlled application of heated water.
 - 1. Allowable pressure: 400-600 psi, or as approved during cleaning mockups.
 - 2. Water flow rate: 4 to 8 gallons per minute.
 - 3. Water may be heated to 185 degrees F to assist in improving cleaning.
 - 4. Use 15-40 degree stainless steel fan tips.
 - 5. Equipment shall have no ferrous parts.

PART 3 EXECUTION

3.1 PROTECTION

- A. Protect persons, motor vehicles, surrounding surfaces of building being restored, building site, plants, and surrounding buildings from harm resulting from Work.
 - 1. Erect temporary protective covers over walkways and at points of pedestrian and vehicular entrance and exit that will remain in service during course of Work.
- B. Prevent mortar from staining face of surrounding masonry and other surfaces.
 - 1. Cover sills, ledges, roof area, mechanical equipment, and projections to protect from mortar droppings.
 - 2. Keep wall area wet below Work area to discourage mortar from adhering.
 - 3. Immediately remove mortar in contact with exposed masonry and other surfaces.

3.2 BRICK REMOVAL AND REPLACEMENT

- A. At locations indicated on the Drawings and as designated by the COR, remove bricks masonry. Perform brick removal also at areas where required to perform inner wythe and substrate wall repairs. Prior to beginning the Work, notify the COR of locations with damaged or deteriorated brick that are not indicated for repair in the Contract Documents.
 - 1. Carefully demolish and remove entire units and mortar from joint to joint, without damaging the surrounding masonry, in a manner that permits replacement with full-size units. Remove and replace sound bricks that are damaged during the Work at no cost to the Owner.
 - 2. Salvage, clean, and store existing intact brick masonry units for use in rebuilding the veneer at high visibility locations.

- B. Support and protect remaining masonry that surrounds removal area.
Maintain flashings, reinforcement, lintels, and adjoining construction in an undamaged condition.
- C. Notify COR of unforeseen detrimental conditions including voids, cracks, bulges, displacements, and loose masonry units in existing masonry backup, rotted wood, corroded metal, and other deteriorated items.
- D. Cover openings and partially completed Work with strong waterproofing membrane at the end of the day, or when the Work is not in progress. Extend the cover at least 2 feet beyond the opening edges and secure in place.
- E. Clean bricks surrounding removal areas by removing mortar, dust, and loose particles in preparation for replacement.
- F. Brick Masonry Installation
 - 1. Install brick in accordance with BIA Technical Note 7B and NCMA TEK Note 3-8A in the bonding and coursing pattern of the existing brick.
 - 2. If cutting is required, use a motor-driven saw designed to cut masonry with clean, sharp, unchipped edges.
 - 3. Lay the replacement masonry as plumb and true to line as the adjacent surfaces will permit; new brickwork shall be flush with the existing.
 - 4. Lay the replacement brick with completely filled bed, head, and collar joints. Do not deeply furrow the bed joints. Butter the ends with sufficient mortar to fill the head joints, and shove into place. Lay replacement concrete masonry with face shell bedding.
 - 5. Maintain the joint width for the replacement units to match the existing joints.
 - a. Tool the exposed mortar joints in the repair areas when the mortar is thumbprint hard, with a round jointer slightly larger than the width of the joint. Tool the joints to match the joints in the surrounding existing brickwork.
 - 6. Do not pound the corners and jambs to fit stretcher units after they are set in position. Where an adjustment must be made after the masonry has been placed, remove and replace the mortar.
 - 7. Install mortar at the top and ends of the repair by packing layers of mortar into the joint with a tuckpointer's tool.

8. Install veneer ties 16 inch on center horizontally and vertically typically, and 8 inch on center around the perimeter of the repair. Embed the ties 3/4 inch minimum and 1-3/4 inch maximum from the exterior face of the veneer, in the mid-thickness of the joint.
9. Install weep vents, a maximum of 24 inch on center, in the head joints in the first course immediately above the flashing. Keep the weepholes free of mortar droppings. Keep the wall cavity (collar joint) free of mortar. Back bevel bed joints down toward the cavity to prevent mortar from extruding into the cavity when the units are placed. If the brick placement is stopped while in progress, either at the end of the day or for some other reason, stop horizontal runs by racking back the mortar of each course one half unit length; do not terminate in a vertical tooth pattern.

3.3 ANCHORING

- A. Anchor new exterior brick veneer to new and existing walls or members with wall ties as shown on the Drawings and specified below.
 1. Space wall ties at 16 inches on center each way with a minimum of 1 tie per rebuild location. One half spaces shall be used at the top or bottom of any wall section and at any ends.
 2. Embed metal ties to a distance between the end of the tie and the exterior face of the new brick veneer of 3/4 in. minimum and 1 3/4 in. maximum
 3. Locate metal ties in the middle of the thickness of the horizontal mortar joints of the brick veneer.

3.4 FINAL CLEANING OF NEW MASONRY

- A. Clean repair areas 24 to 48 hours after completion of the Work. This work is for staining and debris from repair work.
 1. Remove large particles of mortar from exposed masonry surfaces with wood paddles or scrapers. Do not use metal scrapers or brushes unless approved by the COR.
 2. Saturate the brickwork with water and flush off loose mortar and dirt. With a stiff-fiber brush, scrub with cleaning solution. Thoroughly wash off the cleaning solution, dirt, and mortar crumbs with clean, low-pressure water.
 3. For the removal of rust stains, apply cleaning mixture with a trowel, and scrape off when dry. Repeat until the stain is removed, and wash thoroughly with water.

- B. Wash adjacent non-masonry surfaces. Use detergent and soft brushes or cloths. Clean masonry debris from the roof. Sweep and rake the adjacent pavement and grounds to remove masonry debris. Where necessary, pressure wash surfaces to remove mortar, dust, dirt, and stains. Remove scaffolding, equipment, surplus materials, debris, and refuse from the site.

3.5 FIELD QUALITY CONTROL

- A. A project representative of the COR will periodically observe the progress and quality of the Work. Notify the project representative of any field conditions that deviate from the repair details. Allow the project representative use of the scaffolding, as needed, to observe the progress and quality of the Work.
- B. Notify the COR in advance of times when a lift device or scaffolding will be relocated. Do not relocate the lift device or scaffolding until the project representative has had reasonable opportunity to make observations of the work areas at the lift device or scaffold location.
- C. Material Testing: Tests may be requested by Owner or the COR after certification and delivery of the material. The cost of tests shall be paid by the Owner unless the test results indicate that material does not conform to the Specification requirements, in which case the Contractor shall pay the cost of testing.

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SECTION 04 20 00
UNIT MASONRY

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section Includes: Brick masonry units for exterior walls consisting of clay face brick.

1.2 RELATED REQUIREMENTS

- A. Section 04 06 10 - MASONRY MORTAR
- B. Section 04 12 10 - BRICK MASONRY REPAIR AND REPLACEMENT
- C. Section 04 91 60 - REPOINTING WITH CEMENT-LIME MORTAR

1.3 APPLICABLE PUBLICATIONS

- A. Comply with references to extent specified in this section. All standards are to be the latest edition as of the date of this specification.
- B. American Concrete Institute (ACI):
 - 1. 530.1/ASCE 6/TMS 602-13 - Specification for Masonry Structures
- C. ASTM International (ASTM):
 - 1. A951/A951M-14 - Steel Wire for Masonry Joint Reinforcement.
 - 2. C62 - Standard Specification for Building Brick (Solid Masonry Units Made from Clay or Shale).
 - 3. C67 - Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile
 - 4. C216-15 - Standard Specification for Facing Brick (Solid Masonry Units Made From Clay or Shale).
 - 5. C1093 - Standard Practice for Accreditation of Testing Agencies for Unit Masonry
 - 6. C1314 - Standard Test Method for Compressive Strength of Masonry Prisms
- D. Brick Industry Association (BIA):
 - 1. TN 11B-88 - Guide Specifications for Brick Masonry, Part 3.

1.4 SUBMITTALS

- A. Submittal Procedures: Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Submittal Drawings:
 - 1. Manufacturer's Product Data: For each unit indicated. This is to include a description of allowable cleaners for the masonry unit.

2. Material Certification: Include statements of material properties indicating compliance with requirements including compliance with standards and type designations within standards. The certification is also to include a statement that no coatings have been applied to the units during manufacture. Provide for each type and size of unit.

3. Test Reports.

a. For bricks, include size-variation data verifying that actual range of sizes falls within specified tolerances.

b. Include material test reports from an independent testing laboratory showing the following test results:

- 1) Compressive strength per ASTM C67
- 2) 24 hour cold water absorption per ASTM C67
- 3) 5 hour boil absorption per ASTM C67
- 4) Saturation coefficient (c/b ratio) per ASTM C67
- 5) Initial rate of absorption (suction) per ASTM C67
- 6) Efflorescence per ASTM C67
- 7) Freeze-thaw testing per ASTM C67, if required to verify conformance with specifications.

C. Manufacturer's Literature and Data:

1. Description of each product.

2. Installation instructions.

a. Samples: Sample panel, 8 inches by 16 inches, showing full color range and texture of bricks, bond, and proposed mortar joints.

1.5 QUALITY ASSURANCE

A. Testing Agency Qualifications: An independent agency qualified according to ASTM C 1093 for testing indicated.

B. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, through one source from a single manufacturer for each product required.

C. Mockups: Construct sample panels in accordance with Section 04 12 10 - BRICK MASONRY REPAIR AND REPLACEMENT.

1.6 DELIVERY

A. Deliver masonry units to the site strapped together in suitable packs or pallets, or heavy-duty cartons.

B. Deliver other materials to the site in the manufacturer's original and unopened containers.

- C. Mark packaging, legibly. Indicate manufacturer's name or brand, type, color, and manufacture date.
- D. Before installation, return or dispose of products within distorted, damaged, or opened packaging.

1.7 STORAGE AND HANDLING

- A. Store materials covered, protected from weather, and elevated above grade to prevent damage in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacked with waterproof sheeting, securely tied. If units become wet, do not install until they are dry. Discard units that become stained due to ground water or corrosion of strapping metal. Prevent contamination of aggregates.
- B. Protect products from damage during handling and construction operations.

1.8 FIELD CONDITIONS

- A. Environment: See Section 04 12 10 - BRICK MASONRY REPAIR AND REPLACEMENT.

1.9 WARRANTY

- A. Construction Warranty: FAR clause 52.246-21, "Warranty of Construction."

PART 2 - PRODUCTS

2.1 PRODUCTS - GENERAL

- A. Provide each product from one manufacturer and from one production run.
- B. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to exceed tolerances and to contain chips, cracks, or other defects exceeding limits stated in the standard. Do not use units where such defects, including dimensions that vary from specified dimensions by more than stated tolerances, will be exposed in the completed Work or will impair the quality of completed masonry.

2.2 UNIT MASONRY PRODUCTS

- A. Face Brick: Conform to ASTM C 216, Grade SW, Type FBS
 - 1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 5,000 psi.
 - 2. The "Absorption Alternate" in paragraph 6.1.2 of ASTM C216 shall not be used to illustrate conformance with these project specifications. Also, for units where the 24-hour cold water absorption is greater than 8%, the saturation coefficient must be less than 0.68 (average) and 0.70 (individual).

3. Initial Rate of Absorption: Less than 25 grams/30 sq. in. per minute and greater than 5 grams/30 sq. in. per minute when tested per ASTM C 67.
4. Efflorescence: Provide brick that has been tested according to ASTM C 67 and is rated "not effloresced."
5. Provide face brick matching color range, texture, finish, and size of existing adjacent brickwork.
6. Coatings: Units shall not have coatings or clear water repellants of any kind applied to the surfaces by any means without the written permission of COR.
7. Special Shapes: To match existing

2.3 MORTAR

- A. See Section 04 06 10 - MASONRY MORTAR

2.4 ANCHORS, TIES, AND REINFORCEMENT

- A. See Section 04 12 10 - BRICK MASONRY REPAIR AND REPLACEMENT.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Remove and discard masonry units that are chipped, broken, stained, or otherwise damaged beyond tolerances outlined in ASTM C216 or that do not match the submitted sample.

3.2 INSTALLATION - GENERAL

- A. See Section 04 12 10 - BRICK MASONRY REPAIR AND REPLACEMENT.

3.3 INSTALLATION - ANCHORAGE

- A. See Section 04 12 10 - BRICK MASONRY REPAIR AND REPLACEMENT.

3.4 INSTALLATION - REINFORCEMENT: NOT USED

3.5 INSTALLATION - BRICK EXPANSION JOINTS

- A. Provide brick expansion joint (EJ) where indicated on drawings.
- B. Keep joint free of mortar and other debris.
- C. Fill opening in exposed face of expansion and control joints with sealant as specified in Section 07 92 00 - JOINT SEALANTS.

3.6 INSTALLATION - BUILDING EXPANSION AND SEISMIC JOINTS: NOT USED

3.7 INSTALLATION - ISOLATION JOINT: NOT USED

3.8 INSTALLATION - BRICKWORK:

- A. See Section 04 12 10 - BRICK MASONRY REPAIR AND REPLACEMENT.

3.9 INSTALLATION - CONCRETE MASONRY AND STRUCTURAL CLAY TILE UNITS: NOT USED

3.10 INSTALLATION - GLAZED STRUCTURAL FACING TILE: NOT USED

3.11 POINTING: NOT USED

3.12 GROUTING: NOT USED

3.13 PLACING REINFORCEMENT: NOT USED

3.14 INSTALLATION OF REINFORCED BRICK MASONRY: NOT USED

3.15 INSTALLATION OF REINFORCED CONCRETE UNIT MASONRY: NOT USED

3.16 CONSTRUCTION TOLERANCES

- A. Lay masonry units plumb, level and true to line within tolerances according to ACI 530.1/ASCE 6/TMS 602 and as follows:
- B. Maximum variation from plumb:
 - 1. In 10 feet - 1/4 inch.
 - 2. In 20 feet - 3/8 inch.
 - 3. In 40 feet or more - 1/2 inch.
- C. Maximum variation from level:
 - 1. In any bay or up to 20 feet - 1/4 inch.
 - 2. In 40 feet or more - 1/2 inch.
- D. Maximum variation from linear building lines:
 - 1. In any bay or up to 20 feet - 1/2 inch.
 - 2. In 40 feet or more - 3/4 inch.
- E. Maximum variation in prepared opening dimensions:
 - 1. Accurate to minus 0 inch.
 - 2. Plus 1/4 inch.

3.17 CLEANING

- A. Use ONLY cleaners specifically recommended by manufacturer.
- B. See Section 04 12 10 - BRICK MASONRY REPAIR AND REPLACEMENT.
- C. See Section 04 91 60 - REPOINTING WITH CEMENT-LIME MORTAR.

3.18 MASONRY WASTE DISPOSAL

- A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are the Owner's property. At completion of unit masonry work, store units in a location approved by the COR.
- B. Excess Masonry Waste: Remove excess clean masonry waste and legally dispose of waste off Owner's property.

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SECTION 04 91 60
REPOINTING WITH CEMENT-LIME MORTAR

PART 1 GENERAL

1.1 SUMMARY

- A. This Section includes repointing of brick masonry as follows:
 - 1. Isolated preparing and repointing mortar joints between existing concrete masonry backup units (CMU).
 - 2. Pointing mortar joints between new replacement and salvaged and reinstalled brick masonry units.
 - 3. Partial repointing of brick masonry veneer units in areas designated by COR in the field during construction.
- B. Related Sections include the following:
 - 1. Section 04 06 10 - MASONRY MORTAR
 - 2. Section 04 12 10 - BRICK MASONRY REPAIR AND REPLACEMENT
 - 3. Section 04 20 00 - UNIT MASONRY

1.2 REFERENCES

- A. Except as modified by Construction Documents, applicable portions of the latest editions of following reference documents shall govern the Work.
 - 1. ASTM E2260 Standard Guide for Repointing (Tuckpointing) Historic Masonry.
 - 2. National Park Service Cultural Resources Preservation Briefs 2, "Repointing Mortar Joints in Historic Masonry Buildings."
 - 3. Secretary of Interior's Standards for the Treatment of Historic Properties.
 - 4. BIA Tech Note 7F.

1.3 DEFINITIONS

- A. In-situ mortar: Existing mortar including original setting mortar, pointing mortar and subsequently installed setting and repointing mortar
- B. Half Moon: Refers to the configuration of a head joint that has been prepared by removing only a portion of the mortar in the joint by inserting a grinder into the joint and removing the mortar from bed joints.
- C. Original mortar: Mortar used in the original construction of the masonry wall

- D. Original pointing mortar: Mortar placed into a joint at the exposed outer edge from which fresh setting mortar is raked out during original construction of masonry wall.
- E. Point: The act of placing mortar into a properly prepared joint.
- F. Repointing: The process of removal of hardened pointing mortar from between masonry units to a depth less than 1/3 of the depth of the units and placement of fresh mortar.
- G. Setting mortar: Mortar used in original construction to act as a leveling and bonding agent for the masonry units.
- H. Thumbprint hard: Mortar that has reached an initial set. Time required to achieve initial set varies based on masonry characteristics, weather conditions and mortar.
- I. Tuckpointing: Synonymous with repointing.
- J. Low-Pressure Spray: 100 to 400 psi; 4 to 6 gpm.
- K. Very Low Pressure Spray: less than 100 psi
- L. Qualification Data: For restoration specialists including field supervisor/manufacturer.
- M. Restoration Program: For each phase of restoration process, provide detailed description of materials, methods, equipment, and sequence of operations to be used for each phase of restoration work including protection of surrounding materials on building and Project site.
 - 1. Include curing methods.
 - 2. Mortar removal techniques and equipment
 - 3. If materials and methods other than those specified in this section are proposed for any phase of restoration work, provide a written description, including evidence of successful use on comparable projects, and a testing program to demonstrate their effectiveness for this Project.

1.4 QUALITY ASSURANCE

- A. Restoration Specialist Qualifications: Engage an experienced masonry restoration firm to perform work of this Section. Firm shall have completed work similar in material, design, and extent to that indicated for this Project with a record of successful in-service performance.
 - 1. Contractor: Must have a minimum of ten (10) years experience in construction and supervision of masonry work.

2. Masons: Must have a minimum of five (5) years experience in the installation of repointing mortar. Apprentices must be fully supervised by an experience tradesman.
 3. Field Supervision: Restoration specialist firms shall maintain experienced full-time supervisors on Project site during times that clay masonry restoration and cleaning are in progress. Supervisors shall not be changed during Project except for causes beyond the control of restoration specialist firm.
- B. Mockups: Prepare mockups of repointing as follows to demonstrate aesthetic effects and qualities of materials and execution. Prepare mockups on existing walls under same weather conditions to be expected during remainder of the Work.
1. Provide a sample(s) of each type of mortar installation, of the following items. Samples shall be prepared by qualified personnel who will be performing the work. Before work commences, the sample shall be approved by the Owner and COR. The approved sample shall be the standard for the work. Retain acceptable areas in undisturbed condition, suitably marked, during restoration as a standard for judging completed work.
 - a. Sample should match existing historic profile
 - b. Sample should include a sample of cleaning mortar from masonry units adjacent to joints.
 - c. Samples should cure a minimum of 14 days prior to COR's approval
 2. Rake out joints in two separate areas approximately 36 inches high by 72 inches wide for each type of repointing required and repoint one of the two areas.
- C. Field Quality Control: Work in place shall be subject to inspection testing. Work found to be unacceptable shall be replaced with new, acceptable work.

1.5 PROJECT CONDITIONS

- A. Cold-Weather Requirements: Do not perform repointing when the ambient air temperature is less than or is expected to be less than 40 degrees Fahrenheit, unless Contractor provides cold weather protection recommended by BIA for cold weather masonry construction, as outlined in BIA Technical Note 1.
- B. Hot-Weather Requirements: Do not perform repointing when the ambient air temperature is greater than 90 degree Fahrenheit, unless Contractor

provides hot weather protection recommended by BIA for hot weather masonry construction as outlined in BIA Technical Note 1.

1.6 SEQUENCING AND SCHEDULING

- A. Order materials at earliest possible date, to avoid delaying completion of the Work.
- B. Order sand for repointing mortar immediately after approval of mockups. Take delivery of and store at Project site a sufficient quantity of sand to complete Project.
- C. Perform masonry repointing work in the following sequence:
- D. Rake out joints that are to be repointed.
- E. Point mortar joints.
- F. As scaffolding is removed, patch anchor holes used to attach scaffolding. Patch holes in masonry units per Section 04 12 10 - BRICK MASONRY REPAIR AND REPLACEMENT.

PART 2 PRODUCTS

2.1 MORTAR MATERIALS:

- A. See Section 04 06 10 - MASONRY MORTAR

PART 3 EXECUTION

3.1 PROTECTION

- A. Comply with all local applicable codes and ordinances regarding, but not limited to noise and dust mitigation to surrounding areas.
- B. Provide and maintain means to prevent the spread of dust, fumes, smoke and excessive noise within the building.
- C. Protect persons, motor vehicles, surrounding surfaces of building being restored, building site, plants, and surrounding buildings from harm resulting from the work.
 - 1. Erect temporary protective covers over walkways and at points of pedestrian and vehicular entrance and exit that must remain in service during course of the work.
- D. Wall Covering:
 - 1. Cover wall when Work is not in progress in ground-out areas that have not yet been fully repointed
 - 2. Extend cover minimum of 24 in. beyond each side of the openings in walls.
 - 3. Hold the cover securely in place.

E. Prevent mortar from staining face of surrounding masonry and other surfaces.

1. Cover sills, ledges, and projections to protect from mortar droppings. Do not extend coverings into mortar joints.
2. Keep wall area wet below rebuilding and pointing work to discourage mortar from adhering.
3. Immediately remove mortar in contact with exposed masonry and other surfaces.
4. Clean mortar splatters from scaffolding at end of each day.

3.2 REPOINTING MASONRY

A. Rake out and repoint mortar joints to the following extent:

1. All joints in areas indicated.
2. Joints where mortar is missing or where they contain holes.
3. Cracked joints where cracks can be penetrated at least 1/4 inch by a knife blade 0.027 inch thick.
4. Cracked joints where cracks are 1/8 inch or more in width and of any depth.
5. Joints where they sound hollow when tapped by metal object.
6. Joints where they are worn back 1/4 inch or more from surface.
7. Joints where they are deteriorated to point that mortar can be easily removed by hand.
8. Joints, other than those indicated as sealant-filled joints, where they have been filled with substances other than mortar.

B. Rake out joints as follows:

1. Remove mortar from joints to depth of 2 times joint width, but not less than 3/4 inch or not less than that required to expose sound, unweathered mortar. If unsound mortar extends more than 2 inches from the face of the units, work should not proceed and the COR should be contacted immediately.
2. Remove mortar from masonry joint surfaces to provide reveals with square backs and to expose masonry for contact with pointing mortar. Brush, vacuum, or flush joints to remove dirt and loose debris.
3. Do not spall edges of masonry units or widen joints. Replace damaged masonry units as directed by COR.
4. Cut out center of mortar bed joints using angle grinders with diamond-impregnated metal blades. Remove remaining mortar by hand with chisel and mallet. Strictly adhere to written quality-control

- program. Quality-control program shall include provisions for demonstrating ability of operators to use tools without damaging masonry, supervising performance, and preventing damage due to worker fatigue.
- a. "Half-moons" created by grinders will not be allowed.
5. All sealant joints at areas to be repointed are to be raked out during the mortar removal process. After repointing, these joints to be completely removed and replaced.
- C. Notify COR of unforeseen detrimental conditions including voids in mortar joints, cracks, loose masonry units, rotted wood, rusted metal, and other deteriorated items.
- D. Masonry units adjacent to the repair areas that are damaged during the Work shall be removed and replaced at Contractor's expense and to the acceptance of the COR.
- E. Repoint joints as follows:
- 1. Blow loose mortar out prepared joints with compressed air.
 - 2. Rinse masonry-joint surfaces with potable water to remove residual dust and mortar particles. Time rinsing application so, at time of pointing, joint surfaces are damp but free of standing water. If rinse water dries, dampen masonry-joint surfaces before pointing.
 - 3. Apply pointing mortar first to areas where existing mortar was removed to depths greater than surrounding areas. Apply in layers not greater than 1/4 inch until a uniform depth is formed. Fully compact each layer thoroughly and allow it to become thumbprint hard before applying next layer.
 - 4. After deeper areas have been filled to same depth as typical areas, point all joints by placing mortar in layers not greater than 1/4 inch. Fully compact each layer and allow to become thumbprint hard before applying next layer. Where existing masonry has worn or rounded edges, slightly recess finished mortar surface from face of masonry to avoid wider joints. Take care not to spread mortar over edges onto exposed masonry surfaces or to featheredge mortar.
 - 5. When mortar is thumbprint hard, tool joints to match original appearance of joints. Remove excess mortar from edge of joint by brushing.

- F. Cure mortar by maintaining in thoroughly damp condition for at least 72 hours including weekends and holidays.
 - 1. Acceptable curing methods include covering with wet burlap and plastic sheeting, periodic hand misting, and periodic mist spraying using system of pipes, mist heads, and timers.
 - 2. Adjust curing methods to ensure that pointing mortar is damp throughout its depth without eroding surface mortar.
- G. Where repointing work precedes entire building cleaning of existing masonry, allow mortar to cure at least 28 days before beginning entire overall building cleaning.

3.3 FINAL CLEANING

- A. Wipe excess mortar from masonry surface adjacent to mortar joint with a damp sponge or cloth. Note: Use only sponges or cloth that is damp, not wet or saturated. When tightly squeezed water should not run from damp sponge or cloth. Surface of the masonry shall not have visible accumulation of water immediately following cleaning. Do not touch or disturb newly installed pointing mortar during cleaning. Clean until mortar and mortar haze is removed from adjacent masonry surfaces.
- B. Upon completion of repointing, thoroughly rinse surfaces of walls at repointed areas to remove dust and other surface residue from repointing process. Use only low pressure (less than 100 psi) water rinse. Rinse may be eliminated only with COR's approval.
- C. After mortar is fully cured, thoroughly clean exposed masonry surfaces of excess mortar and foreign matter; use wood scrapers, stiff-nylon or fiber brushes, and clean water, spray applied at low pressure.
 - 1. Do not use metal scrapers or brushes.
 - 2. Do not use acidic or alkaline cleaners unless specified herein [or approved by COR].
- D. Wash adjacent woodwork and other non-masonry surfaces. Use detergent and soft brushes or cloths.

E. If mortar remains on the surface following repointing and initial clean-up the following procedure may be used if deemed necessary by the COR:

1. Apply cleaning agent to trial repair area to inspect its effectiveness and to determine any necessary revisions to cleaning procedures. The cleaning shall be performed in accordance with the following procedure:
 - a. Do not clean masonry work with chemicals prior to 72 hours after masonry work or repointing is completed.
 - b. Use specified cleaning solution in accordance with manufacturer's written recommendations.
 - c. Pre-wet areas of wall to be cleaned prior to installation of cleaning solution.
 - d. Do not allow cleaning solution to dry on the masonry
 - e. Remove large particles of mortar with wood paddles and scrapers before wetting the wall. Saturate the masonry with clean water and flush off all loose mortar and dirt. Scrub with a stiff fiber brush. Thoroughly wash all cleaning solution, dirt/mortar using clean, low-pressure water.
 - f. Do not damage masonry.
 - g. Cleaning process shall be repeated as necessary.
 - h. Thoroughly rinse wall. When wall is nearing the drying point, check pH of wall with test paper. Continue to rise wall until pH is between 6 and 8.
 - i. Rinse water, pressures and equipment shall conform with Masonry Cleaning Section.

F. Clean masonry debris from roof; remove debris from drainage components. Rinse off roof and flush drainage components.

G. Sweep and rake adjacent pavement and grounds to remove masonry debris. Where necessary, pressure wash surfaces to remove mortar, dust, dirt, and stains.

3.4 FIELD QUALITY CONTROL

- A. Inspectors: COR will engage qualified independent inspectors to perform inspections and prepare test reports. Allow inspectors use of lift devices and scaffolding, as needed, to perform inspections.
- B. Architect/Engineer's Project Representatives: Architect/Engineer will assign Project representatives to help carry out Architect/Engineer's

responsibilities at the site, including observing progress and quality of portion of the Work completed. Allow Architect/Engineer's Project representatives use of scaffolding, as needed, to observe progress and quality of portion of the Work completed.

- C. Notify COR in advance of times when lift devices and scaffolding will be relocated. Do not relocate lift devices and scaffolding until COR have had reasonable opportunity to make observations of work areas at lift device or scaffold location.

3.5 CLEAN UP

- A. At the conclusion of repointing, remove all scaffolding and equipment used in the Work. Clean all debris, refuse and surplus of material and remove same from premises.

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SECTION 06 10 00
ROUGH CARPENTRY

PART 1 - GENERAL

1.1 DESCRIPTION:

A. This section specifies wood blocking, nailers, and rough hardware.

1.2 RELATED WORK: NOT USED

1.3 SUBMITTALS:

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

C. Shop Drawings showing framing connection details, fasteners, connections and dimensions.

D. Manufacturer's Literature and Data:

1. Submit data for lumber, hardware and adhesives.

2. Submit data for wood-preservative treatment from chemical treatment manufacturer and certification from treating plants that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.

4. For products receiving a waterborne treatment, submit statement that moisture content of treated materials was reduced to levels specified before shipment to project site.

E. Manufacturer's certificate for unmarked lumber.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING:

A. Protect lumber and other products from dampness both during and after delivery at site.

B. Pile lumber in stacks in such manner as to provide air circulation around surfaces of each piece.

C. Stack plywood and other board products so as to prevent warping.

D. Locate stacks on well drained areas, supported at least 6 inches above grade and cover with well-ventilated sheds having firmly constructed over hanging roof with sufficient end wall to protect lumber from driving rain.

1.5 QUALITY ASSURANCE:

A. Installer: A firm with a minimum of three (3) years' experience in the type of work required by this section.

1.6 GRADING AND MARKINGS:

A. Any unmarked lumber or plywood panel for its grade and species will not be allowed on VA Construction sites for lumber and material not

normally grade marked, provide manufacturer's certificates (approved by an American Lumber Standards approved agency) attesting that lumber and material meet the specified the specified requirements.

1.7 APPLICABLE PUBLICATIONS:

- A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in the text by basic designation only.
- B. American Forest and Paper Association (AFPA):
- NDS-15.....National Design Specification for Wood
Construction
- WCD1-01.....Details for Conventional Wood Frame
Construction
- C. American Institute of Timber Construction (AITC):
- A190.1-07.....Structural Glued Laminated Timber
- D. American Society of Mechanical Engineers (ASME):
- B18.2.1-12 (R2013).....Square and Hex Bolts and Screws
- B18.2.2-10.....Square and Hex Nuts
- B18.6.1-81 (R2008).....Wood Screws
- E. American Plywood Association (APA):
- E30-11.....Engineered Wood Construction Guide
- F. ASTM International (ASTM):
- A653/A653M-13.....Steel Sheet Zinc-Coated (Galvanized) or Zinc-
Iron Alloy Coated (Galvannealed) by the Hot Dip
Process
- C954-11.....Steel Drill Screws for the Application of
Gypsum Board or Metal Plaster Bases to Steel
Studs from 0.033 inch to 0.112-inch in
thickness
- C1002-14.....Steel Self-Piercing Tapping Screws for the
Application of Gypsum Panel Products or Metal
Plaster Bases to Wood Studs or Metal Studs
- D198-14.....Test Methods of Static Tests of Lumber in
Structural Sizes
- D2344/D2344M-13.....Test Method for Short-Beam Strength of Polymer
Matrix Composite Materials and Their Laminates

- D2559-12a.....Adhesives for Structural Laminated Wood
Products for Use Under Exterior (Wet Use)
Exposure Conditions
- D3498-03(R2011).....Adhesives for Field-Gluing Plywood to Lumber
Framing for Floor Systems
- D6108-13.....Test Method for Compressive Properties of
Plastic Lumber and Shapes
- D6109-13.....Test Methods for Flexural Properties of
Unreinforced and Reinforced Plastic Lumber and
Related Products
- D6111-13a.....Test Method for Bulk Density and Specific
Gravity of Plastic Lumber and Shapes by
Displacement
- D6112-13.....Test Methods for Compressive and Flexural Creep
and Creep-Rupture of Plastic Lumber and Shapes
- F844-07a(R2013).....Washers, Steel, Plan (Flat) Unhardened for
General Use
- F1667-13.....Nails, Spikes, and Staples
- G. American Wood Protection Association (AWPA):
AWPA Book of Standards
- H. Commercial Item Description (CID):
A-A-55615.....Shield, Expansion (Wood Screw and Lag Bolt Self
Threading Anchors)
- I. Forest Stewardship Council (FSC):
FSC-STD-01-001(Ver. 4-0)FSC Principles and Criteria for Forest
Stewardship
- J. Military Specification (Mil. Spec.):
MIL-L-19140E.....Lumber and Plywood, Fire-Retardant Treated
- K. Environmental Protection Agency (EPA):
40 CFR 59(2014).....National Volatile Organic Compound Emission
Standards for Consumer and Commercial Products
- L. Truss Plate Institute (TPI):
TPI-85.....Metal Plate Connected Wood Trusses
- M. U.S. Department of Commerce Product Standard (PS)
PS 1-95.....Construction and Industrial Plywood
PS 20-10.....American Softwood Lumber Standard

N. ICC Evaluation Service (ICC ES):

AC09.....Quality Control of Wood Shakes and Shingles

AC174.....Deck Board Span Ratings and Guardrail Systems

(Guards and Handrails)

PART 2 - PRODUCTS

2.1 LUMBER:

A. Unless otherwise specified, each piece of lumber must bear grade mark, stamp, or other identifying marks indicating grades of material, and rules or standards under which produced.

1. Identifying marks are to be in accordance with rule or standard under which material is produced, including requirements for qualifications and authority of the inspection organization, usage of authorized identification, and information included in the identification.

2. Inspection agency for lumber approved by the Board of Review, American Lumber Standards Committee, to grade species used.

C. Lumber Other Than Structural:

1. Unless otherwise specified, species graded under the grading rules of an inspection agency approved by Board of Review, American Lumber Standards Committee.

2. Framing lumber: Minimum extreme fiber stress in bending of 1100 PSI.

3. Furring, blocking, nailers and similar items 4 inches and narrower Standard Grade; and, members 6 inches and wider, Number 2 Grade.

D. Sizes:

1. Conforming to PS 20.

2. Size references are nominal sizes, unless otherwise specified, actual sizes within manufacturing tolerances allowed by standard under which produced.

E. Moisture Content:

1. Maximum moisture content of wood products is to be as follows at the time of delivery to site.

a. Boards and lumber 2 inches and less in thickness: 19 percent or less.

b. Lumber over 2 inches thick: 25 percent or less.

F. Fire Retardant Treatment:

1. Comply with Mil Spec. MIL-L-19140.

2. Treatment and performance inspection, by an independent and qualified testing agency that establishes performance ratings.

G. Preservative Treatment:

1. Do not treat Heart Redwood and Western Red Cedar.
2. Treat wood members and plywood exposed to weather or in contact with plaster, masonry or concrete, ; nailers, edge strips, blocking, crickets, curbs, cant, vent strips and other members provided in connection with flashing materials.
3. Treat other members specified as preservative treated (PT).
4. Preservative treat by the pressure method complying with AWPA Book use category system standards U1 and T1, except any process involving the use of Chromated Copper Arsenate (CCA) or other agents classified as carcinogenic for pressure treating wood is not permitted.

2.2 PLASTIC LUMBER: NOT USED

2.3 PLYWOOD:

- A. Comply with PS 1.
- B. Bear the mark of a recognized association or independent inspection agency that maintains continuing control over quality of plywood which identifies compliance by veneer grade, group number, span rating where applicable, and glue type.
- C. Sheathing:
1. APA rated Exposure 1 or Exterior; panel grade CD or better.
 2. Wall sheathing:
 - a. Minimum 11/32 inch thick with supports 16 inches on center and 15/32 inch thick with supports 24 inches on center unless specified otherwise.
 - b. Minimum 48 inches wide at corners without corner bracing of framing.
- E. Underlayment:
1. APA rated Exposure 1 or Exterior, panel grade C-C Plugged.

2.4 STRUCTURAL-USE PANELS: NOT USED

2.5 ROUGH HARDWARE AND ADHESIVES:

- A. Anchor Bolts:
1. ASME B18.2.1 and ASME B18.2.2 galvanized, 1/2 inch unless shown otherwise.
 2. Extend at least 8 inches into masonry or concrete with ends bent 2 inches.
- B. Miscellaneous Bolts: Expansion Bolts: C1D A-A-55615; lag bolt, long enough to extend at least 2-1/2 inches into masonry or concrete. Provide 1/2 inch bolt unless shown otherwise.

C. Washers

1. ASTM F844.
2. Provide zinc or cadmium coated steel or cast iron for washers exposed to weather.

D. Screws:

1. Wood to Wood: ASME B18.6.1 or ASTM C1002.
2. Wood to Steel: ASTM C954, or ASTM C1002.

E. Nails:

1. Size and type best suited for purpose unless noted otherwise.
Provide aluminum-alloy nails, plated nails, or zinc-coated nails, for nailing wood work exposed to weather and on roof blocking.
2. ASTM F1667:
 - a. Common: Type I, Style 10.
 - b. Concrete: Type I, Style 11.
 - c. Barbed: Type I, Style 26.
 - d. Underlayment: Type I, Style 25.
 - e. Masonry: Type I, Style 27.
 - f. Provide special nails designed for use with ties, strap anchors, framing connectors, joists hangers, and similar items. Nails not less than 1-1/4 inches long, 8d and deformed or annular ring shank.

G. Adhesives:

1. For field-gluing plywood to lumber framing floor or roof systems:
ASTM D3498.
2. For structural laminated Wood: ASTM D2559.
3. Adhesives to have a VOC content of 70 g/L or less when calculated according to 40 CFR 59, (EPA Method 24).

PART 3 - EXECUTION

3.1 INSTALLATION OF FRAMING AND MISCELLANEOUS WOOD MEMBERS:

A. Conform to applicable requirements of the following:

3. AFPA WCD1 for nailing and framing unless specified otherwise.
4. APA for installation of plywood panels.

B. Fasteners:

1. Nails.
 - a. Nail in accordance with the Recommended Nailing Schedule as specified in AFPA WCD1 where detailed nailing requirements are not specified in nailing schedule. Select nail size and nail

spacing sufficient to develop adequate strength for the connection without splitting the members.

- d. Use 8d or larger nails for nailing through 1-inch-thick lumber and for toe nailing 2-inch-thick lumber.
 - e. Use 16d or larger nails for nailing through 2-inch-thick lumber.
 - f. Select the size and number of nails in accordance with the Nailing Schedule except for special nails with framing anchors.
 - g. Nailing Schedule; Using Common Nails:
2. Bolts:
- a. Fit bolt heads and nuts bearing on wood with washers.
 - b. Countersink bolt heads flush with the surface of nailers.
 - c. Provide bolts to steel over 0.112-inch, 11 gage in thickness. Secure wood nailers to vertical structural steel members with bolts, placed one at ends of nailer and 24-inch intervals between end bolts. Provide clips to beam flanges.
3. Drill Screws to steel less than 0.112 inches thick.
- a. ASTM C1002 for steel less than 0.033 inches thick.
 - b. ASTM C954 for steel over 0.033 inches thick.
4. Power actuated drive pins may be provided where practical to anchor to solid masonry, concrete, or steel.
5. Do not anchor to wood plugs or nailing blocks in masonry or concrete. Provide metal plugs, inserts or similar fastening.
6. Screws to Join Wood:
- a. Where shown or option to nails.
 - b. ASTM C1002, sized to provide not less than 1-inch penetration into anchorage member.
 - c. Spaced same as nails.
- C. Cut notch, or bore in accordance with AFPA WCD1 passage of ducts wires, bolts, pipes, conduits and to accommodate other work. Repair or replace miscut, misfit or damaged work.
- D. Blocking Nailers, and Furring:
- 1. Install furring, blocking, nailers, and grounds where shown.
 - 2. Provide longest lengths practicable.
 - 3. Provide fire retardant treated wood blocking where shown at openings and where shown or specified.
 - 4. Layers of Blocking or Plates:
 - a. Stagger end joints between upper and lower pieces.

- b. Nail at ends and not over 24 inches between ends.
 - c. Stagger nails from side to side of wood member over 5 inches in width.
- E. Rough Bucks:
- 1. Install rough wood bucks at opening in masonry or concrete where wood frames or trim occur.
 - 2. Brace and maintain bucks plumb and true until masonry has been built around them or concrete cast in place.
 - 3. Cut rough bucks from 2-inch-thick stock, of same width as partitions in which they occur and of width shown in exterior walls.
 - 4. Extend bucks full height of openings and across head of openings; fasten securely with anchors specified.
- F. Underlayment:
- 1. Where finish flooring of different thickness is used in adjoining areas, provide underlayment of thickness required to bring finish-flooring surfaces into same plane.
 - 2. Apply to dry, level, securely nailed, clean, wood subfloor without any projections.
 - 3. Plywood and particle underlayment are to be glue-nailed to subfloor.
 - 4. Butt underlayment panels to a light contact with a 1/32 inch space between plywood or hardboard underlayment panels and walls, and approximately 3/8 inch between particleboard underlayment panels and walls.
 - 5. Stagger underlayment panel end joints with respect to each other and offset joints with respect to joints in the subfloor at least 2 inches.
 - 6. After installation, avoid traffic on underlayment and damage to the finish surface.

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SECTION 07 19 00
WATER REPELLENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Surface preparation, supply, and application of silane water repellent for brick masonry and precast concrete surfaces.

1.2 RELATED WORK

- A. Section 03 01 05 - CLEANING EXTERIOR FACADES
- B. Section 03 33 00 - ARCHITECTURAL CONCRETE REPAIRS
- C. Section 04 12 10 - BRICK MASONRY REPAIR AND REPLACEMENT
- D. Section 04 20 00 - UNIT MASONRY
- E. Section 04 91 60 - REPOINTING WITH CEMENT-LIME MORTAR
- F. Section 07 92 00 - JOINT SEALANTS

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordinate Work to ensure that adjacent areas are not adversely affected. Coordinate:

1. With Owner's Representative.
2. With other trades:
 - a. To ensure that work done by other trades is complete and ready for water-repellent Work.
 - b. To avoid or minimize work on, or in immediate vicinity of, water-repellent Work in progress.
 - c. To ensure that subsequent work will not adversely affect quality of installed water repellent.

B. Pre-application Meeting:

1. Conduct meeting at Site.
2. Time, date, location, and attendee notification to be facilitated by Contractor.
3. Review requirements for water-repellent application, including:
 - a. Construction schedule.
 - b. Availability of materials, Applicator's personnel, equipment, and facilities needed to make progress and avoid delays.
 - c. Site use, access, staging, and set-up location limitations.
 - d. Approved mockup procedures.
 - e. Forecast weather conditions and impact on Work.
 - f. Surface preparation and substrate condition.
 - g. Application procedures.

- h. Minimum curing period.
- i. Testing and inspection requirements.
- j. Governing regulations, including environmental regulations.
- 4. Contractor's Site superintendent, water-repellent manufacturer's technical representative, water-repellent Applicator's foreman, COR, and Architect/Engineer shall attend.

1.4 SUBMITTALS

- A. Submittal Procedures: Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Manufacturers Literature and Data:
 - 1. Water-repellent manufacturer's literature including product description and written instructions for storage, handling, substrate preparation, protection of surrounding areas not to receive water-repellent, application, and final cleaning. Include VOC content.
- C. Environmental Certification:
 - 1. Environmental regulations applicable to Site.
 - 2. Certification, signed by water-repellent manufacturer, that water repellent complies with environmental regulations applicable to Site.
- D. Test Reports: Written results of field testing performed by water-repellent manufacturer or Applicator.
- E. Applicator Qualifications:
 - 1. Certification signed by water-repellent manufacturer, certifying that Applicator complies with manufacturer's requirements to install specified water repellent.
 - 2. Evidence that Applicator's existing company has minimum three years of continuous experience in similar water-repellent work; list of at least five representative, successfully-completed projects of similar scope and size, including:
 - a. Project name.
 - b. Owner's name, Representative name, address, and telephone number.
 - c. Description of work.
 - d. Water repellents used.
 - e. Project supervisor.
 - f. Total cost of water-repellent work and total cost of project.
 - g. Completion date.

1.5 QUALITY ASSURANCE

A. Contractor Qualifications:

1. Experienced firm that has successfully completed water-repellent work similar in material, design, and extent to that indicated for Project; and that is approved, authorized, or licensed by water-repellent manufacturer to install water repellent. Must have successful installations of specified materials in local area in use for minimum of three years.
2. Employ foreman trained by water-repellent manufacturer and with minimum three (3) years of experience as foreman on similar projects, who is fluent in English, to be on Site at all times during Work. Do not change foremen during the course of the Project except for reasons beyond the control of Installer; inform COR in advance of any changes.

B. Manufacturer Certifications:

1. Water-repellent manufacturer shall certify that product to be used complies with VOC regulations at Site.

C. Mockups:

1. Visual Mockup:

- a. Prior to the start of Work or purchase of material, in presence of COR and water-repellent manufacturer's representative, apply water repellent to at least 25 square feet of each substrate, at locations determined by the COR, to demonstrate surface preparation, application, finished appearance, and standard of workmanship.
- b. After 48 hours or when mockups are thoroughly dry, COR will evaluate finished appearance.
- c. At request of COR, procure core samples from mockups and wet sides to demonstrate penetration of water repellent.

2. Performance Mockup:

- a. Apply water repellent to mockup wall areas as designated on Drawings.
- b. Coordinate work with other trades and repairs being performed as part of the mockup.
- c. Water testing of mockup to be performed if desired by Owner.

3. General:

- a. If mockup fails performance testing or if COR determines mockup does not comply with requirements, construct new mockup until mockup is approved.
- b. Approved mockups will be standard for judging completed Work.
- c. Approved mockups may become part of completed Work if undisturbed at time of Substantial Completion.

1.6 DELIVERY

- A. Deliver other materials to the site in the manufacturer's original and unopened containers.
- B. Mark packaging, legibly. Indicate manufacturer's name or brand, type, color, and manufacture date.
- C. Before installation, return or dispose of products within distorted, damaged, or opened packaging.

1.7 STORAGE AND HANDLING

- A. Store materials covered, protected from weather, and elevated above grade to prevent damage.
- B. Protect products Maintain copies of all applicable Safety Data Sheets (SDS) with materials in storage area, such that they are available for ready reference on Site.

1.8 PROJECT CONDITIONS

- A. Verify existing dimensions and details prior to the start of water-repellent Work. Notify COR of conditions found to be different than those indicated in the Contract Documents. COR will review situation and inform Contractor and Applicator how to proceed.
- B. Comply with Owner's limitations and restrictions for Site use and accessibility.
- C. Environmental Limitations: Apply water repellent within range of ambient and substrate temperatures recommended by water-repellent manufacturer. Do not apply water repellent under the following conditions, unless otherwise recommended by water-repellent manufacturer and approved by COR.
 - 1. To substrates that are damp or wet, or that have dew, frost, snow, or ice on them.
 - 2. To substrates below 40 degrees F or less than 5 degrees F above dew point, or above 90 degrees F.

3. When ambient temperature is below 40 degrees F, or is predicted to fall below 40 degrees F within eight hours after application, or is above 90 degrees F.
 4. When rain, snow, fog, or mist is predicted within 24 hours.
 5. When wind speeds are at or above 15 miles per hour, or if windy conditions exist that may cause water repellent to be blown onto vegetation or surfaces not intended to be treated.
 6. On rebuilt or recently pointed brick masonry exterior walls for at least 30 days following repairs.
- D. Handle and install materials in strict accordance with safety requirements required by water-repellent manufacturer; Material Safety Data (SDS) Sheets; and local, state, and federal rules and regulations.
- E. Maintain adequate ventilation during preparation and application of water-repellent materials. Notify Owner's Representative at least one week in advance of Work with materials with noxious vapors. Review application schedule and venting precautions with Owner's Representative prior to beginning application.

1.6 FIELD CONDITIONS

- A. During rehabilitation work, existing conditions may be encountered which are not known or are at variance with the Contract Documents. Such conditions may interfere with the Work and may consist of damage or deterioration of the substrate or surrounding materials that could jeopardize the integrity or performance of the Work.
1. Notify COR prior to proceeding with the Work of conditions that may interfere with, preclude proper execution of, or jeopardize the performance of the Work.

PART 2 - PRODUCTS

2.1 PENETRATING WATER REPELLENT

- A. Silane: Use one of the following products or approved equal:
1. SL100 Water Repellent, manufactured by Prosoco, Inc.
 2. Sikagard H 1000, manufactured by the Sika Corporation.
 3. Protectosil CHEM-TRETE BSM 400, manufactured by Evonik

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions with Applicator and water-repellent manufacturer's representative for compliance with requirements and other conditions affecting application or performance of water repellent.
 - 1. Ensure that work done by other trades is complete and ready for water-repellent Work.
 - 2. Verify that areas and conditions under which water-repellent Work is to be performed permit proper and timely completion of Work.
 - 3. Notify COR in writing of conditions which may adversely affect application or performance of water repellent and recommend corrections.
 - 4. Do not proceed with water-repellent Work until adverse conditions have been corrected and reviewed by COR.
 - 5. Commencing water-repellent Work constitutes acceptance of Work surfaces and conditions.

3.2 PROTECTION

- A. Take precautions to ensure safety of people (including building users, passers-by, and workers) and protection of property (including building facade systems/components, adjacent building elements, landscaping, motor vehicles, etc.).
 - 1. Erect temporary protective canopies and walls, as necessary, at walkways and at points of pedestrian and vehicular access that must remain in service during Work.
- B. Cover adjacent surfaces with materials that are proven to resist water repellent.
- C. Protect paving and sidewalks, and adjacent building areas from mechanical damage due to scaffolding and other equipment.
- D. Prevent dust, debris, coating overspray/spatter, and other construction materials from coming into contact with pedestrians, motor vehicles, landscaping, buildings, and other surfaces that could be harmed by such contact.
- E. Limit access to Work areas.
- F. Comply with water-repellent manufacturer's written instructions for protecting building and other surfaces against damage from exposure to its products.

- G. Assume responsibility for injury to persons or damage to property due to Work, and remedy at no cost to Owner.
- H. Protect from damage, all elements of completed work and original construction to remain.

3.3 SURFACE PREPARATION

- A. Equipment:
 - 1. Water spray equipment capable of removing laitance, dirt, loose or foreign material, and surface contaminants from exposed concrete surfaces.
 - 2. Compressed air equipment capable of removing dust, dirt, and water.
- B. Clean and prepare concrete substrates according to water-repellent manufacturer's written instructions and Section 03 01 05 - EXTERIOR FACADE CLEANING. Provide clean, dust-free, and dry substrate.
 - 1. Allow wet substrates to dry for at least 24 hours. Verify that substrate is sound and is visibly dry and free of moisture.
 - 2. Sealants are to be fully cured.
 - 3. Remove grease, oil, asphalt solids, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete. Use concrete cleaner approved by water-repellent manufacturer where necessary. If cleaner is used, rinse thoroughly to remove cleaner residue.
 - 4. Thoroughly sweep substrate and clean with oil-free compressed air.
- C. Clean and prepare brick masonry surfaces using procedure demonstrated in mockup and approved by COR. Provide clean, dust-free, and dry substrate. Verify that mortar has cured and aged for minimum time period recommended by water-repellent manufacturer but not less than twenty-one days (21).
- D. Proceed with application only after unsatisfactory conditions have been corrected. Commencing application constitutes acceptance of Work surfaces and conditions.

3.4 APPLICATION

- A. Equipment:
 - 1. Low-pressure (15 to 25 pounds per square inch), airless spray equipment.
 - 2. Low-pressure (15 to 25 pounds per square inch), positive-displacement, garden-type spray equipment, fitted with fan-spray nozzle

3. Brushes and rollers.

4. Brooms and squeegees.

B. Before beginning application:

1. Provide and maintain traffic barricades and control measures, well outside limits of wind-drifting, during application and drying of water repellent to protect vehicular and pedestrian traffic from contact with water repellent. Enclose Work area to contain wind-blown overspray.

2. Provide adequate ventilation during and after application of water repellent.

3. Provide dry-chemical fire extinguishers and clearly post "NO SMOKING" signs in Work area.

C. Apply heavy-saturation coating of water repellent at coverage rate demonstrated in mockup, in a uniform manner, using low-pressure spray equipment, brushes, and rollers to achieve point of saturation.

1. Apply in dual passes of uniform, overlapping strokes.

2. Remove excess material; do not allow material to puddle beyond saturation.

3. Comply with manufacturer's written instructions for using airless spraying procedure.

a. Prior to use of spray equipment, thoroughly clean spray equipment, tanks, and hoses, and make free of water, foreign matter, and oily residues. Flush with anhydrous alcohol or small amounts of silane.

b. Apply to horizontal surfaces with spray bar. Use hand-spray unit at edges.

c. On vertical surfaces, apply from bottom up, with controlled run-down of about 8 inches, with hand-spray unit, brushes, and rollers. Apply till refusal.

d. Use brushes and rollers at edges of application area to avoid overspray on adjacent surfaces.

4. If water-repellent application is not completed at one time, clearly mark location where application is terminated.

3.5 CLEANING

A. Immediately clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

- B. At the end of each workday, hose down surfaces affected by rundown or overspray and broom-clean Site and Work areas and place all items to be discarded in appropriate containers.
- C. After completing water repellent Work:
 - 1. Clean all materials resulting from Work that are not intended to be part of the finished Work using appropriate cleaning agents and procedures. Exercise care to avoid damaging surfaces.
 - 2. Repair at no cost to Owner all items damaged during the Work.
 - 3. Remove and legally dispose of debris and surplus materials from Site.

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Milwaukee VAMC
695-22-121 VAMKE Bldg 111 Façade Repair
Milwaukee, WI 53295

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March 16, 2026

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SECTION 07 27 26
FLUID-APPLIED MEMBRANE AIR BARRIERS, VAPOR PERMEABLE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Fluid-applied vapor-permeable air barrier at exterior above grade wall assemblies.
2. Connection to adjacent air barrier components providing a durable, continuous, full building air barrier.

1.2 RELATED WORK

- A. Section 04 12 10 - BRICK MASONRY REPAIR AND REPLACEMENT
- B. Section 04 91 60 - REPOINTING WITH CEMENT-LIME MORTAR
- C. Section 04 20 00 - UNIT MASONRY
- D. Section 07 60 00 - FLASHING AND SHEET METAL
- E. Section 07 92 00 - JOINT SEALANTS

1.3 APPLICABLE PUBLICATIONS

- A. Comply with references to extent specified in this section.
- B. Air Barrier Association of America (ABAA): Quality Assurance Program.
- C. ASTM INTERNATIONAL:
 1. D226: Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
 2. D779: Standard Test Method for Water Resistance of Paper, Paperboard, and Other Sheet Materials by the Dry Indicator Method (withdrawn).
 3. D1709: Standard Test Methods for Impact Resistance of Plastic Film by the Free-Falling Dart Method.
 4. E96: Standard Test Methods for Water Vapor Transmission of Materials.
 5. E1677: Standard Specification for Air Barrier (AB) Material or System for Low-Rise Framed Building Walls.
 6. E1745: Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.
 7. E1993: Standard Specification for Bituminous Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs.
 8. E2178: Standard Test Method for Air Permeance of Building Materials.
- D. ICC EVALUATION SERVICE (ES):
 1. AC38: Acceptance Criteria for Water-Resistive Barriers.

1.4 SUBMITTALS

- A. Submittal Procedures: Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
 - 1. Show size, configuration, and fabrication and installation details.
- B. Manufacturer's Literature and Data:
 - 1. Description of each product.
 - 2. Installation instructions.
- C. Sustainable Construction Submittals:
 - 1. Low Pollutant-Emitting Materials:
 - a. Identify volatile organic compound types and quantities.
- D. Test reports:
 - 1. Submit field inspection and test reports.
- E. Certificates: Certify each product complies with specifications.
 - 1. Compatibility: Certify products are compatible with adjacent materials.
- F. Qualifications: Substantiate qualifications comply with specifications.
 - 1. Installer with project experience.
 - a. Include personnel qualifications.
 - b. Field supervisor qualifications.
 - c. Certify installer approval by air barrier manufacturer.
- G. Installation Audit:
 - 1. Submit audit report.

1.5 QUALITY ASSURANCE

- A. Coordinate work with adjacent and related work to provide continuous, unbroken, durable air barrier system.
- B. Manufacturer Qualifications:
 - 1. Regularly and presently manufactures specified products.
 - 2. Manufactured specified products with satisfactory service on five similar installations for minimum five years.
 - 3. Accreditation by ABAA.
- C. Installer Qualifications:
 - 1. Regularly and presently installs specified products.
 - 2. Approved by manufacturer.
 - 3. Accredited by ABAA.
 - 4. Applicators certified according to ABAA Quality Assurance Program.
 - 5. Applicators trained and certified by manufacturer of air barrier system.

6. Full time on-site field supervisor has completed three (3) projects of similar scope within last year.
 7. Field Supervisor: Holds Sealant, Waterproofing, and Restoration Institute (SWRI) Wall Coating Validation Program Certificate, or similar qualification acceptable to Contracting Officer's Representative.
 8. Field supervisor accredited by ABAA as Level 3 Accredited Installer.
- D. Testing Agency Qualifications:
1. Accredited by International Accreditation Service, Inc. or American Association for Laboratory Accreditation.
 2. Certified to perform ABAA Quality Assurance Program installer audits.
 3. Staff experienced in installation of specified system and qualified to perform observation and inspection specified and determine compliance with project requirements.
- E. Mockup: Before continuation of Work, participate in mockup to demonstrate typical flashing installation details, including corner connections, sealing of gaps, terminations, and penetrations.
1. Coordinate construction of mockup to permit inspection of installed barrier by representative of material manufacturer and COR. Manufacturer's representative shall provide written approval of mockup installation.
 2. If the manufacturer's representative or COR determines that mockup does not comply with requirements, modify or remove and replace flashing until mockup is approved.

1.6 DELIVERY

- A. Deliver masonry units to the site strapped together in suitable packs or pallets, or heavy-duty cartons.
- B. Deliver other materials to the site in the manufacturer's original and unopened containers.
- C. Mark packaging, legibly. Indicate manufacturer's name or brand, type, color, and manufacture date.
- D. Before installation, return or dispose of products within distorted, damaged, or opened packaging.

1.7 STORAGE AND HANDLING

- A. Store materials covered, protected from weather, and elevated above grade to prevent damage

- B. Prevent contamination of aggregates.
- C. Protect products from damage during handling and construction operations.

1.8 FIELD CONDITIONS

- A. Verify existing dimensions and details prior to start of barrier/retarder Work. Notify COR of conditions found to be different than those indicated in the Contract Documents. COR will review situation and inform Contractor and Installer of changes.
- B. Environment:
 - 1. Work Area Ambient Temperature Range: 40 to 90 degrees F continuously, beginning 48 hours before installation.
 - 2. Surface Requirements: visibly dry, and complying with manufacturer's instructions.
- C. Handle and install materials in strict accordance with safety requirements required by barrier/retarder manufacturer; Safety Data Sheets (SDS); and local, state, and federal rules and regulations. Maintain Safety Data Sheets (SDS) with materials in storage area and available for ready reference on Site.

1.9 WARRANTY

- A. Construction Warranty: FAR clause 52.246-21, "Warranty of Construction."

PART 2 - PRODUCTS

2.1 SYSTEM PERFORMANCE

- A. Air-Barrier Assembly Air Leakage: Maximum 00.04 cfm/square feet of surface area at 1.57 psf differential pressure when tested according to ASTM E2357.
- B. Full Building Air Leakage: Refer to Section 01 45 29 TESTING LABORATORY SERVICES.
- C. Provide full system of compatible materials under conditions of service and application required. Compatibility based on testing by material manufacturer.
- D. Perform as continuous vapor permeable air barrier and moisture drainage plane.
- E. Transition to adjacent flashings and discharge water to building exterior.
- F. Accommodate substrate movement and seal expansion and control joints, construction material transitions, opening transitions, penetrations, and perimeter conditions without moisture deterioration and air leakage exceeding performance requirements.

2.2 PRODUCTS - GENERAL

- A. Provide air barrier system components from one manufacturer.
- B. Sustainable Construction Requirements:

2.3 AIR BARRIER

- A. Fluid-Applied, Vapor-Permeable Membrane Air Barrier:
 - 1. Elastomeric, modified bituminous or synthetic polymer membrane.
 - 2. Air Permeance: ASTM E2178: 0.004 cfm/square feet of surface area at 1.57 psf differential pressure.
 - 3. Vapor Permeance: ASTM E96/E96M: Minimum 10 perms.
 - 4. Elongation: Ultimate, ASTM D412, Die C: 200 percent, minimum.
 - 5. Thickness: Dry film thickness as required by air barrier manufacturer, applied in single or multiple coats as necessary to achieve minimum required final dry film thickness.
 - 6. Surface Burning Characteristics: When tested according to ASTM E84.
 - a. Flame Spread Rating: 25, maximum.
 - b. Smoke Developed Rating: 450, maximum.
 - 7. Basis of Design: PERM-A-BARRIER VPL, manufactured by GCP Applied Technologies., Cambridge, MA.
 - 8. Approved equal:
 - a. Air-Bloc 17MR, manufactured by Henry Company, Segundo, CA.
 - b. Air-Shield LM, manufactured by W.R. Meadows, Hampshire, IL.

2.4 ACCESSORIES

- A. Single source: Provide proprietary accessories by the WRB manufacturer approved for use with the WRB product and adjacent substrates.
- B. Primer: Waterborne primer complying with VOC requirements, recommended air barrier manufacturer to suit application.
- C. Substrate Patching Material: Manufacturer's standard trowel-grade filler material.
- D. Detailing Sealant: Manufacturer's approved sealant to be used at membrane edges and terminations, penetrations through WRB, joint treatment beneath WRB.
 - 1. PERM-A-BARRIER Universal Flashing & Sealant by GCP, use with PERM-A-BARRIER VPL
 - 2. 925 BES Sealant by Henry, use with Air-Bloc 17MR
 - 3. BEM by W.R. Meadows, use with Air-Shield LM

PART 3 - EXECUTION

3.1 PREPARATION

- A. Examine and verify substrate suitability for product installation.
- B. Protect existing construction and completed work from damage.
- C. Correct substrate deficiencies:
 - 1. Remove projections and excess materials and fill voids with substrate patching material.
 - 2. Remove contaminants capable of affecting subsequently installed products' performance.
- D. Prepare and treat substrate joints and cracks according to ASTM C1193 and membrane air barrier manufacturer's instructions. This includes grinding and pointing deteriorated concrete masonry unit (CMU) mortar joints and treating cracks in CMU backup.

3.2 INSTALLATION - AIR BARRIER

- A. Install products according to manufacturer's instructions and approved submittal drawings.
 - 1. When manufacturer's instructions deviate from specifications, submit proposed resolution for Contracting Officer's Representative consideration.
- B. Install air barrier components according to requirements of ABAA Quality Assurance Program.
- C. Apply primer.
- D. Install transition strips and accessory materials.
- E. Seal air barrier to adjacent components of building air barrier system.
- F. Install flexible opening transition at each opening perimeter. Extend transition onto each substrate minimum 4 inches.
- G. At penetrations, seal transition strips around penetrating objects with termination sealant.
- H. Apply air barrier in full contact with substrate to produce continuous seal with transitions.
- I. Apply fluid membrane in thickness recommended by manufacturer, and minimum specified thickness.
- J. Leave air barrier exposed until tested and inspected and approved by Contracting Officer's Representative.

3.3 FIELD QUALITY CONTROL

- A. Field Inspections and Tests: Perform inspections and tests before concealing air barrier with subsequent work.

B. Inspections:

1. Compatibility of materials within air barrier system and adjacent materials.
2. Suitability of substrate and support for air barrier.
3. Suitability of conditions under which air barrier is applied.
4. Adequacy of substrate priming.
5. Application and treatment of joints and edges of transition membrane, flexible opening transitions, and accessory materials.
6. Continuity and gap-free installation of air barrier, transition membrane, and accessory materials.

C. Tests:

1. Use of wet film thickness gauge during application of fluid-applied WRB to verify membrane thickness.
2. Qualitative air-leakage testing according to ASTM E1186. Testing to be performed by A/E.

D. Inspection and Test Frequency: Determined by installed air barrier surface area.

1. Up to 10,000 square feet: One inspection.
2. 10,001 - 35,000 square feet: Two inspections.
3. 35,001 - 75,000 square feet: Three inspections.
4. 75,001 - 125,000 square feet: Four inspections.
5. 125,001 - 200,000 square feet: Five inspections.
6. Over 200,000 square feet: Six inspections.

E. Submit inspection and test reports to Contracting Officer's Representative within seven calendar days of completing inspection and test.

F. Audit:

1. Provide installer and site inspections audit by COR.
2. Coordinate scheduling of work and associated audit inspections.
3. Cooperate with COR. Allow access to work and staging areas.
4. Notify COR in writing of schedule for Work of this Section to allow sufficient time for testing and inspection.

G. Defective Work:

1. Correct deficiencies, make necessary repairs, and retest as required to demonstrate compliance with specified requirements.

3.4 CLEANING

A. Remove masking materials.

- B. Clean spills and overspray using cleaning agents recommended by manufacturers of affected construction.

3.5 PROTECTION

- A. Protect air barrier from construction operations.
- B. Protect air barrier from exposure to UV light exposure exceeding manufacturer's recommendation.
- C. Replace overexposed materials and retest.

- - - E N D - - -

SECTION 07 60 00
FLASHING AND SHEET METAL

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Formed sheet metal work for shelf angle flashings, cavity closure angles, and miscellaneous wall and roofing interfaces.
- B. Transition membrane flashings.

1.2 RELATED WORK

- A. Section 04 12 10 - BRICK MASONRY REPAIR AND REPLACEMENT
- B. Section 07 27 26 - FLUID-APPLIED MEMBRANE AIR BARRIER, VP
- C. Section 07 92 00 - JOINT SEALANTS
- D. Section 09 97 13 - STEEL COATINGS

1.3 APPLICABLE PUBLICATIONS

- A. Publications listed below form a part of this specification to the extent referenced. Publications are referenced in the text by the basic designation only. Editions of applicable publications current on date of issue of bidding documents apply unless otherwise indicated.
- B. Aluminum Association (AA):
 - AA-C22A41.....Aluminum Chemically etched medium matte, with clear anodic coating, Class I Architectural, 0.7-mil thick
 - AA-C22A42.....Chemically etched medium matte, with integrally colored anodic coating, Class I Architectural, 0.7 mils thick
 - AA-C22A44.....Chemically etched medium matte with electrolytically deposited metallic compound, integrally colored coating Class I Architectural, 0.7-mil thick finish
- C. American Architectural Manufacturers Association (AAMA):
 - AAMA 621-02.....Voluntary Specification for High Performance Organic Coatings on Coil Coated Architectural Hot Dipped Galvanized (HDG) and Zinc-Aluminum Coated Steel Substrates
 - A653/A653M-20.....Steel Sheet Zinc-Coated (Galvanized) or Zinc Alloy Coated (Galvanized) by the Hot- Dip Process

A755/A755M.....Standard Specification for Steel Sheet,
Metallic Coated by the Hit-Dip Process and
Prepainted by the Coil-Coating Process for
Exterior Exposed Building Products
B32-08(2014).....Solder Metal
B209-14.....Aluminum and Aluminum-Alloy Sheet and Plate
C920.....Standard Specification for Elastomeric Joint
Sealants

- D. Sheet Metal and Air Conditioning Contractors National Association (SMACNA): Architectural Sheet Metal Manual.
- E. National Association of Architectural Metal Manufacturers (NAAMM): AMP 500-06.....Metal Finishes Manual
- F. Federal Specification (Fed. Spec):
 - A-A-1925A.....Shield, Expansion; (Nail Anchors)
 - UU-B-790A.....Building Paper, Vegetable Fiber
- G. International Code Commission (ICC): International Building Code, Current Edition
- H. SSPC: The Society for Protective Coatings.

1.4 PERFORMANCE REQUIREMENTS: NOT USED

1.5 SUBMITTALS

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Shop Drawings: For all specified items, including:
 - 1. Flashings
 - 2. Expansion joints
- C. Manufacturer's Literature and Data: For all specified items, including:
 - 1. Flexible, self-adhering membrane flashing
 - 2. Sheet metal pan flashing and end dams
- D. Certificates: Indicating compliance with specified finishing requirements, from applicator and contractor.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Experienced firm that has successfully completed sheet-metal work similar in material, design, and extent to that indicated for Project. Must have successful installations of specified materials in local area in use for minimum of five years.
- B. Employ foreman with minimum five (5) years of experience as foreman on similar projects to be on Site at all times during Work. Do not change

foremen during the course of the Project except for reasons beyond the control of the Installer; inform COR in advance of any changes.

1.7 DELIVERY

- A. Deliver other materials to the site in the manufacturer's original and unopened containers.
- B. Mark packaging, legibly. Indicate manufacturer's name or brand, type, color, and manufacture date.
- C. Before installation, return or dispose of products within distorted, damaged, or opened packaging.

1.8 STORAGE AND HANDLING

- A. Store materials covered, protected from weather, and elevated above grade to prevent damage
 - 1. Prevent contamination of aggregates.
- B. Protect products from damage during handling and construction operations.

1.9 FIELD CONDITIONS

- A. Verify existing dimensions and details prior to start of sheet-metal Work. Notify COR of conditions found to be different than those indicated in the Contract Documents. COR will review situation and inform Contractor and Installer of changes.
- B. Comply with Owner's limitations and restrictions for Site use and accessibility.
- C. Environmental Limitations: Install sheet-metal members when existing and forecast weather conditions permit sealants, coatings, and miscellaneous materials to be installed according to sealant, coating, or miscellaneous material manufacturer's written instructions and warranty requirements.
- D. Handle and install materials in strict accordance with safety requirements required by sheet-metal manufacturer; Safety Data Sheets (SDS); and local, state, and federal rules and regulations. Maintain Safety Data Sheets (SDS) with materials in storage area and available for ready reference on Site.

1.10 WARRANTY

- A. Construction Warranty: FAR clause 52.246-21, "Warranty of Construction."

PART 2 - PRODUCTS

2.1 FLASHING AND SHEET METAL MATERIALS

- A. Stainless Steel: Stainless steel sheet, ASTM A167, Type 304; No. 2D mill rolled finish; 26 gauge
 - 1. Solder: ASTM Specification B32, composition 50 percent tin and 50 percent lead.
 - 2. Flux: Special stainless steel type flux. Neutralize flux after soldering.

2.2 FLASHING ACCESSORIES

- A. Self-Adhering Flashing Membrane:
 - 1. General: All primers and lap sealant to be as recommended by the flashing membrane manufacturer.
 - 2. Through-Wall Flashing Membrane:
 - a. Perm-A-Barrier Wall Membrane, manufactured by GCP Applied Technologies, Inc., Cambridge, MA. Use with PERM-A-BARRIER VPL.
 - b. Blueskin TWF, manufactured by Henry Companies, Segundo, CA. Use with Air-Bloc 17MR.
 - c. Air-Shield Thru-Wall Flashing, manufactured by W.R. Meadows, Hampshire, IL. Use with Air-Shield LM.
 - 3. Transition Membrane:
 - a. Perm-A-Barrier Detail Membrane, manufactured by GCP Applied Technologies, Inc., Cambridge, MA. Use with PERM-A-BARRIER VPL.
 - b. Blueskin SA, manufactured by Henry Companies, Segundo, CA. Use with Air-Bloc 17MR.
 - c. Air-Shield by W.R. Meadows, Hampshire, IL. Use with Air-Shield LM.
- B. Miscellaneous Materials:
 - 1. General: Provide materials and types of fasteners, protective coatings, separators, sealants, and other miscellaneous items required for installation.
 - 2. Custom manufactured termination bars:
 - a. 300 series stainless steel, 1/8 in. thick reglet.
 - b. Dimensions as shown in on Drawings.
 - c. Provide termination bars in largest lengths possible without exceeding 10 ft.

- d. Attach to include:
 - 1) Masonry or Concrete
 - a) Aggre-Gator Type 304 stainless steel/bi-metal fasteners, manufactured by DeWalt Anchors and Fasteners, Inc.
 - b) Tapper type 304 stainless steel concrete screw anchor, manufactured by DeWalt Anchors and Fasteners, Inc.
 - c) Approved equal.
- 3. Miscellaneous Materials:
 - a. General: Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items required for installation.
- 4. Separator Sheet: Continuous 6 mil polyethylene membrane or tape or approved equal. To be used in all locations as necessary to prevent contact between dissimilar metals.
- 5. Miscellaneous Fasteners: Self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads.
 - a. Size fasteners to provide penetration at least three threads into metal backup.
 - 1) General Fasteners:
 - a) 300 series stainless or 300 series stainless-steel with bi-metal tip, except that aluminum fasteners may be used with aluminum sheet metal.
 - b. Exposed Fasteners: Heads match color of sheet metal by means of plastic caps or factory-applied coating.
 - c. Fasteners for Flashing, Trim: Blind fasteners or self-drilling screws, gasketed, with hex washer head.
 - 1) Blind Fasteners: High-strength aluminum or 300 series stainless-steel rivets.
- 6. Sealing Tape: Pressure-sensitive, 100-percent solids, polyisobutylene-compound sealing tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, non-staining tape.
- 7. Elastomeric Sealant and Preformed Silicone Sealant: Elastomeric silicone sealant; of type, grade, class, and use classifications required to seal joints and edges in sheet-metal flashing and trim to remain watertight as specified in Section 07 92 00 - JOINT SEALANTS.

8. Metal to Metal Lap Sealant: Non-skinning butyl sealant as specified in Section 07 92 00 - JOINT SEALANTS.
9. Cell Vents: 4 in. tall by depth of stone/masonry by 3/8 in. wide polypropylene cell vents tested in conformance with ASTM D2240, D790B, D638 and D1238B. Color to match mortar.

2.3 SHEET METAL THICKNESS

- A. Except as otherwise shown or specified use thickness or weight of sheet metal as follows:
- B. Concealed Locations (Built into Construction):
 1. Stainless steel: 0.010 inch thick.
 2. Galvanized steel: 0.021 inch thick.
- C. Exposed Locations:
 1. Stainless steel: 0.015 inch.
- D. Thickness of aluminum or galvanized steel is specified with each item.

2.4 FABRICATION, GENERAL

- A. Jointing:
 1. In general, stainless steel joints, except expansion and contraction joints, shall be locked and soldered.
 2. Jointing of stainless steel over 0.018 inch thick shall be done by lapping, riveting and soldering.
 3. Joints shall conform to following requirements:
 - a. Flat-lock joints shall finish not less than 3/4 inch wide.
 - b. Lap joints subject to stress shall finish not less than one inch wide and shall be soldered and riveted.
 - c. Unsoldered lap joints shall finish not less than 4 inches wide.
 4. Flat and lap joints shall be made in direction of flow.
 5. Edges of nonreinforced elastomeric sheeting shall be jointed by lapping not less than 4 inches in the direction of flow and cementing with asphalt roof cement or sealant as required by the manufacturer's printed instructions.
 6. Soldering:
 - a. Pre tin both mating surfaces with solder for a width not less than 1 1/2 inches of stainless steel.
 - b. Treat in accordance with metal producers recommendations other sheet metal required to be soldered.
 - c. Completely remove acid and flux after soldering is completed.

B. Expansion and Contraction Joints:

1. Fabricate in accordance with the Architectural Sheet Metal Manual recommendations for expansion and contraction of sheet metal work in continuous runs.
2. Space joints as shown or as specified.
3. Space expansion and contraction joints for stainless steel at intervals not exceeding 24 feet.
4. Space expansion and contraction joints for aluminum at intervals not exceeding 18 feet, except do not exceed 10 feet for gravel stops and fascia-cant systems.
5. Fabricate slip-type or loose locked joints and fill with sealant unless otherwise specified.
6. Fabricate joint covers of same thickness material as sheet metal served.

C. Drips:

1. Form drips at lower edge of sheet metal counter-flashings (cap flashings), wall copings, by folding edge back 1/2 inch and bending out 45 degrees from vertical to carry water away from the wall.
2. Form drip to provide hook to engage cleat or edge strip for fastening for not less than 3/4 inch loose lock where shown.

D. Edges:

1. Edges of flashings concealed in masonry joints opposite drain side shall be turned up 1/4 inch to form dam, unless otherwise specified or shown otherwise.
2. Finish exposed edges of flashing with a 1/4 inch hem formed by folding edge of flashing back on itself when not hooked to edge strip or cleat. Use 1/4 inch minimum penetration beyond wall face with drip for pan flashing exposed edge.
3. All metal roof edges shall meet requirements of IBC, current edition.

E. Metal Options:

1. Where options are permitted for different metals use only one metal throughout.
2. Stainless steel may be used in concealed locations for fasteners of other metals exposed to view.

2.5 FINISHES

- A. Use same finish on adjacent metal or components and exposed metal surfaces unless specified or shown otherwise.

B. In accordance with NAAMM Metal Finishes Manual AMP 500, unless otherwise specified.

C. Finish exposed metal surfaces as follows, unless specified otherwise:

1. Stainless Steel: Finish No. 2B or 2D.

2.6 THROUGH-WALL FLASHINGS: NOT USED

2.7 BASE FLASHING: NOT USED

2.8 COUNTERFLASHING (CAP FLASHING OR HOODS): NOT USED

2.9 GRAVEL STOPS: NOT USED

2.10 BITUMEN STOPS: NOT USED

2.11 HANGING GUTTERS: NOT USED

2.12 CONDUCTORS (DOWNSPOUTS): NOT USED

2.13 SPLASPANS: NOT USED

2.14 REGLETS: NOT USED

2.15 INSULATED EXPANSION JOINT COVERS: NOT USED

2.16 ENGINE EXHAUST PIPE OR FLUE OR STACK FLASHING: NOT USED

2.17 SCUPPERS: NOT USED

2.18 GOOSENECK ROOF VENTILATORS: NOT USED

PART 3 - EXECUTION

3.1 INSTALLATION

A. General:

1. Install flashing and sheet metal items as shown in Sheet Metal and Air Conditioning Contractors National Association, Inc., publication, ARCHITECTURAL SHEET METAL MANUAL, except as otherwise shown or specified.
2. Apply Sealant as specified in Section 07 92 00, JOINT SEALANTS.
3. Apply sheet metal and other flashing material to surfaces which are smooth, sound, clean, dry and free from defects that might affect the application.
4. Remove projections which would puncture the materials and fill holes and depressions with material compatible with the substrate. Cover holes or cracks in wood wider than 1/4 inch with sheet metal compatible with the roofing and flashing material used.
5. Install sheet metal flashing and trim to fit substrates and to result in watertight performance.
 - a. Install true to line and levels indicated.
 - b. Where exposed, install without excessive oil canning, buckling, or tool marks.

- c. Provide uniform, neat seams with minimum exposure of solder, welds, or sealant.
- d. Do not torch cut sheet metal.
- 6. Provide for thermal expansion of exposed flashing and trim for expanses beyond 10 ft.
 - a. Space movement joints no more than 10 feet apart, with no joint within 24 inches of corner or intersection.
- 7. Seal metal to metal joints with high temperature, non-skinning, non-hardening butyl sealant. - (Metal to metal flashing and through wall flashing lap splices) as specified in Section 07 92 00 Joint Sealants
- 8. Coordinate with masonry work for the application of a skim coat of mortar to surfaces of unit masonry to receive flashing material before the application of flashing.
- 9. Confine direct nailing of sheet metal to strips 12 inch or less wide. Nail flashing along one edge only. Space nail not over 4 inches on center unless specified otherwise. Install screws where indicated, specified, or required in accordance with the SMACNA Sheet Metal Manual. Where required to prevent galvanic action between dissimilar metal, paint contact surfaces with bituminous coating or by other permanent separation as recommended by fabricator or manufacturers of dissimilar metals.

3.2 CLEANING

- A. At end of each workday, clean site and work areas and place rubbish, empty cans, rags, and other discarded materials in appropriate containers.
- B. After completing sheet metal Work, clean spillage and soiling from adjacent surfaces using cleaning agents and procedures recommended by manufacturer of affected surface. Exercise care to avoid scratching or damage to surfaces. Repair surfaces stained, marred, or otherwise damaged during roofing Work.
- C. At conclusion of Work, clean up debris and surplus materials and remove from site.

3.3 PROTECTION

- A. Protect sheet metal flashings, trim, and membrane flashings from damage and wear during remainder of construction period.

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SECTION 07 92 00
JOINT SEALANTS

PART 1 - GENERAL

1.1 DESCRIPTION:

- A. This section covers exterior sealant application, wherever required for complete installation of building materials or systems. This Includes sealant application at terminations of fluid-applied air/water barrier and flashings, and installation of sealant at joints between precast concrete panels and brick masonry walls, windows, and adjacent precast concrete panels.

1.2 RELATED WORK (INCLUDING BUT NOT LIMITED TO THE FOLLOWING):

- A. Section 03 33 00 - ARCHITECTURAL CONCRETE REPAIRS
B. Section 04 12 10 - BRICK MASONRY REPAIR AND REPLACEMENT
C. Section 04 20 00 - UNIT MASONRY
D. Section 07 27 26 - FLUID-APPLIED MEMBRANE AIR BARRIER, VAPOR PERMEABLE
E. Section 07 60 00 - FLASHING AND SHEET METAL

1.3 QUALITY ASSURANCE:

- A. Installer Qualifications: An experienced installer with a minimum of three (3) years' experience and who has specialized in installing joint sealants similar in material, design, and extent to those indicated for this Project and whose work has resulted in joint-sealant installations with a record of successful in-service performance. Submit qualification.
- B. Source Limitations: Obtain each type of joint sealant through one (1) source from a single manufacturer.
- C. Product Testing: Obtain test results from a qualified testing agency based on testing current sealant formulations within a 12-month period.
1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C1021.
 2. Test elastomeric joint sealants for compliance with requirements specified by reference to ASTM C920, and where applicable, to other standard test methods.
 3. Test elastomeric joint sealants according to SWRI's Sealant Validation Program for compliance with requirements specified by reference to ASTM C920 for adhesion and cohesion under cyclic movement, adhesion-in peel, and indentation hardness.

4. Test other joint sealants for compliance with requirements indicated by referencing standard specifications and test methods.
- D. Lab Tests: Submit samples of materials that will be in contact or affect joint sealants to joint sealant manufacturers for tests as follows:
1. Adhesion Testing: Before installing elastomeric sealants, test their adhesion to protect joint substrates according to the method in ASTM C794 to determine if primer or other specific joint preparation techniques are required.
 2. Compatibility Testing: Before installing elastomeric sealants, determine compatibility when in contact with glazing and gasket materials.
 3. Stain Testing: Perform testing per ASTM C1248 on interior and exterior sealants to determine if sealants or primers will stain adjacent surfaces. No sealant work is to start until results of these tests have been submitted to the Contracting Officer Representative (COR) and the COR has given written approval to proceed with the work.
- E. Preconstruction Field-Adhesion Testing: Before installing elastomeric sealants, field test their adhesion to joint substrates according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1.1 in ASTM C1193 or Method A, Tail Procedure, in ASTM C1521.
1. Locate test joints where indicated in construction documents or, if not indicated, as directed by COR.
 2. Conduct field tests for each application indicated below:
 - a. Each type of elastomeric sealant and joint substrate indicated.
 - b. Each type of non-elastomeric sealant and joint substrate indicated.
 3. Notify COR seven (7) days in advance of dates and times when test joints will be erected.
 4. Arrange for tests to take place with joint sealant manufacturer's technical representative present.

F. Mockups: Before installing joint sealants, apply elastomeric sealants as follows to verify selections and to demonstrate aesthetic effects and qualities of materials and execution:

1. Joints in mockups of assemblies that are indicated to receive elastomeric joint sealants. Provide color sample mockups for each joint type for COR review and approval.

1.4 CERTIFICATION:

A. Contractor is to submit to the COR written certification that joints are of the proper size and design, that the materials supplied are compatible with adjacent materials and backing, that the materials will properly perform to provide permanent watertight, airtight or vapor tight seals (as applicable), and that materials supplied meet specified performance requirements.

1.5 SUBMITTALS:

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Installer qualifications.
- C. Contractor certification.
- D. Manufacturer's installation instructions for each product used.
- E. Cured samples of exposed sealants for each color.
- F. Manufacturer's Literature and Data:
 1. Primers
 2. Sealing compound, each type, including compatibility when different sealants are in contact with each other.
- G. Manufacturer warranty.

1.6 PROJECT CONDITIONS:

- A. Environmental Limitations:
 1. Do not proceed with installation of joint sealants under following conditions:
 - a. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 40 degrees F.
 - b. When joint substrates are wet.
- B. Joint-Width Conditions:
 1. Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.

C. Joint-Substrate Conditions:

1. Do not proceed with installation of joint sealants until
contaminants capable of interfering with adhesion are removed from
joint substrates.

1.7 DELIVERY, HANDLING, AND STORAGE:

- A. Deliver materials to Project site in original packages with seals
unbroken, labeled with sealant manufacturer's name, product brand name
and type, date of manufacture, lot number, and directions for storing
and mixing with other components.
- B. Keep materials dry and do not allow materials to be exposed to moisture
during transportation, storage, handling, or installation. Reject and
remove from Site new materials which exhibit evidence of moisture
during application or which have been exposed to moisture.
- C. Store materials in original, undamaged containers in clean, dry,
protected location on raised platforms with weather-protective
coverings, within temperature range required by sealant manufacturer.
Protect stored materials from direct sunlight. Sealant manufacturer's
standard packaging and covering is not considered adequate weather
protection.
- D. Limit stored materials on structures to safe loading of structure
- E. Handle materials to avoid damage.
- F. Conspicuously mark wet or damaged materials and remove from site as
soon as possible.
- G. Remove and replace materials that cannot be applied within stated shelf
life.

1.8 PROJECT CONDITIONS:

- A. Verify existing dimensions and details prior to installation of
materials. Notify COR of conditions found to be different than those
indicated in Contract Documents. COR will review situation and inform
Contractor and Installer of changes.
- B. Comply with Owner's limitations and restrictions for site use and
accessibility.

C. Environmental Limitations: Install sealant when existing and forecast weather conditions permit sealant to be installed according to sealant manufacturer's written instructions and warranty requirements.

1. Do not install sealant when ambient or substrate temperatures are below 40 degrees F or are expected to fall below 40 degrees F in the next 12 hours.
2. Do not proceed with installation during inclement weather except for temporary work necessary to protect building interior and installed materials. Remove temporary work and Work that becomes moisture damaged.

1.9 WARRANTY:

- A. Construction Warranty: Comply with FAR clause 52.246-21 "Warranty of Construction".
- B. Manufacturer Warranty: Manufacturer shall warranty their sealant for a minimum of five (5) years from the date of installation and final acceptance by the Government. Submit manufacturer warranty.

1.10 APPLICABLE PUBLICATIONS:

- A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in text by basic designation only.
- B. ASTM International (ASTM):
 - C717-14a.....Standard Terminology of Building Seals and Sealants
 - C794-10.....Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants
 - C920-14a.....Elastomeric Joint Sealants.
 - C1021-08 (R2014).....Laboratories Engaged in Testing of Building Sealants
 - C1193-13.....Standard Guide for Use of Joint Sealants.
 - C1248-08 (R2012).....Test Method for Staining of Porous Substrate by Joint Sealants
 - C1521-13.....Standard Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints
 - E84-09.....Surface Burning Characteristics of Building Materials
- C. Sealant, Waterproofing and Restoration Institute (SWRI).
The Professionals' Guide

D. Environmental Protection Agency (EPA):

40 CFR 59(2014).....National Volatile Organic Compound Emission
Standards for Consumer and Commercial Products

PART 2 - PRODUCTS

2.1 SEALANTS:

A. Exterior Sealants:

1. Provide location(s) of exterior sealant as follows:
 - a. Joints formed where original metal frames and subsills of windows, doors, louvers, and vents adjoin precast concrete.
 - b. Precast concrete to precast concrete panel joints
 - c. Precast concrete panels to brick masonry.
 - d. Masonry expansion joints.
 - e. Masonry joints where shelf angles occur.
 - f. Voids where items penetrate exterior walls.
 - g. Edges/termination of air/water barrier and flashings.
2. General:
 - a. Comply with ASTM C920 and other requirements indicated.
 - b. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer, based on testing on similar projects, mockups and preconstruction testing for this project, and field experience.
 - c. Select products based on mockups, preconstruction testing, and sealant manufacturer's previous testing and experience.
 - d. Source Limitations: Obtain each type of joint sealant through one source from single manufacturer.
 - e. Colors of Exposed Joint Sealants: Selected and approved in writing by Owner's Representative, from sealant manufacturer's full range to match existing colors.
3. One-part Silicone, Non-staining & Non-bleeding, Non-sag ($\pm$ 50% movement). Color to be selected by COR.
 - a. DOWSIL 756 SMS by Dow Corning Corporation.
 - b. SCS9000 SilPruf NB by Momentive Performance Materials (GE).
 - c. Approved equal.
4. Non-skinning butyl sealant. - Metal to metal lap splices.
 - a. TREMPRO JS-773+ Non-Skinning Butyl Sealant by Tremco

- b. PTI 707 Butyl Rubber Sealant by C.R. Laurence
- c. Pecora BA-98 by Pecora

2.2 COLOR:

- A. Sealants used at horizontal bed joints at shelf angles and flashing are to match color of mortar joints. Sealants used at vertical expansion joints in brick masonry veneer and penetrations through brick masonry veneer are to match color of brick masonry units.
- B. Sealants used at precast concrete panel joints, joints between precast concrete panels and brick masonry wall areas, or at routed cracks in precast concrete panels are to match color of adjacent concrete. Sealants used at perimeter joints between original windows and precast concrete panels are to match existing metal window frames.

2.3 JOINT SEALANT BACKING:

- A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backings: ASTM C1330, of Type C (closed-cell non-gassing material with surface skin) and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance:
 - 1. SOF ROD, Bi-cellular Backer-Rod by Nomaco
 - 2. Approved equal
- C. Elastomeric Tubing Sealant Backings: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D1056 or synthetic rubber (ASTM C509), nonabsorbent to water and gas, and capable of remaining resilient at temperatures down to minus 26 degrees F. Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and otherwise contribute to optimum sealant performance.
- D. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.4 WEEPS:

A. Weep/Vent Products: Provide the following unless otherwise indicated or approved.

1. Round Plastic Tubing: Medium-density polyethylene, 3/8-inch OD by thickness of stone or masonry veneer.

2.5 FILLER:

- A. Mineral fiberboard: ASTM C612, Class 1.
- B. Thickness same as joint width.
- C. Depth to fill void completely behind back-up rod.

2.6 PRIMER:

- A. As recommended by manufacturer of caulking or sealant material.
- B. Stain free type.

2.7 CLEANERS-NON POROUS SURFACES:

- A. Chemical cleaners compatible with sealant and acceptable to manufacturer of sealants and sealant backing material. Cleaners to be free of oily residues and other substances capable of staining or harming joint substrates and adjacent non-porous surfaces and formulated to promote adhesion of sealant and substrates.

PART 3 - EXECUTION

3.1 INSPECTION:

- A. Inspect substrate surface for bond breaker contamination and unsound materials at adherent faces of sealant.
- B. Coordinate for repair and resolution of unsound substrate materials.
- C. Inspect for uniform joint widths and that dimensions are within tolerance established by sealant manufacturer.

3.2 PREPARATIONS:

- A. Prepare joints in accordance with manufacturer's instructions and SWRI (The Professionals' Guide).

- B. Clean surfaces of joint to receive caulking or sealants leaving joint dry to the touch, free from frost, moisture, grease, oil, wax, lacquer paint, or other foreign matter that would tend to destroy or impair adhesion.
 - 1. Clean, porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants.
 - 2. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air. Porous joint surfaces include but are not limited to the following:
 - a. Concrete.
 - b. Masonry.
 - 3. Remove laitance and form-release agents from concrete.
 - 4. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous surfaces include but are not limited to the following:
 - a. Metal.
 - b. Glass.
- C. Do not cut or damage joint edges.
- D. Apply non-staining masking tape to face of surfaces adjacent to joints before applying primers, caulking, or sealing compounds.
 - 1. Do not leave gaps between ends of sealant backings.
 - 2. Do not stretch, twist, puncture, or tear sealant backings.
 - 3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
- E. Apply primer to sides of joints wherever required by compound manufacturer's printed instructions or as indicated by pre-construction joint sealant substrate test.
 - 1. Apply primer prior to installation of back-up rod or bond breaker tape.
 - 2. Use brush or other approved means that will reach all parts of joints. Avoid application to or spillage onto adjacent substrate surfaces.

3.3 BACKING INSTALLATION:

- A. Install backing material, to form joints enclosed on three sides as required for specified depth of sealant.
- B. Where deep joints occur, install filler to fill space behind the backing rod and position the rod at proper depth.
- C. Cut fillers installed by others to proper depth for installation of backing rod and sealants.
- D. Install backing rod, without puncturing the material, to a uniform depth, within plus or minus 1/8 inch for sealant depths specified.
- E. Where space for backing rod does not exist, install bond breaker tape strip at bottom (or back) of joint so sealant bonds only to two opposing surfaces.

3.4 SEALANT DEPTHS AND GEOMETRY:

- A. At widths up to 1/4 inch, sealant depth equal to width.
- B. At widths over 1/4 inch, sealant depth 1/2 of width up to 1/2 inch maximum depth at center of joint with sealant thickness at center of joint approximately 1/2 of depth at adhesion surface.

3.5 INSTALLATION:

- A. General:
 - 1. Apply sealants and caulking only when ambient temperature is between 40 degrees and 100 degrees F.
 - 2. Do not install sealant type listed by manufacture as not suitable for use in locations specified.
 - 3. Apply caulking and sealing compound in accordance with manufacturer's printed instructions.
 - 4. Avoid dropping or smearing compound on adjacent surfaces.
 - 5. Fill joints solidly with compound and finish compound smooth.
 - 6. Tool exposed joints to form smooth and uniform beds, with slightly concave surface conforming to joint configuration per Figure 5A in ASTM C1193 unless shown or specified otherwise in construction documents. Remove masking tape immediately after tooling of sealant and before sealant face starts to "skin" over. Remove any excess sealant from adjacent surfaces of joint, leaving the working in a clean finished condition.
 - 7. Apply compounds with nozzle size to fit joint width.
 - 8. Test sealants for compatibility with each other and substrate. Use only compatible sealant. Submit test reports.

9. Replace sealant which is damaged during construction process.
- B. Weeps: Place weep holes and vents in joints where moisture may accumulate, including at base of cavity walls, above shelf angles, at all flashing, and as indicated on construction documents.
 1. Use round plastic tubing to form weep holes.
 2. Space weep holes formed from plastic tubing not more than 16 inches On-center.
 3. Trim tubing material used in weep holes flush with exterior wall face after sealant has set.
- C. For application of sealants, follow requirements of ASTM C1193 unless specified otherwise. Take all necessary steps to prevent three-sided adhesion of sealants.

3.6 FIELD QUALITY CONTROL:

- A. Field-Adhesion Testing: Field-test joint-sealant adhesion to joint substrates according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C1193 or Method A, Tail Procedure, in ASTM C1521. Testing shall be performed by sealant manufacturer's technical representative at no cost to the Owner.
 1. Extent of Testing: Test completed elastomeric sealant joints as follows:
 - a. Perform 10 tests for first 1000 feet of joint length for each type of elastomeric sealant and joint substrate.
 - b. Perform one test for each 1000 feet of joint length thereafter or one test per each floor per elevation.
- B. Inspect joints for complete fill, for absence of voids, and for joint configuration complying with specified requirements. Record results in a field adhesion test log.
- C. Inspect tested joints and report on following:
 1. Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate.
 2. Compare these results to determine if adhesion passes sealant manufacturer's field-adhesion hand-pull test criteria.
 3. Whether sealants filled joint cavities and are free from voids.
 4. Whether sealant dimensions and configurations comply with specified requirements.

- D. Record test results in a field adhesion test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant fill, sealant configuration, and sealant dimensions.
- E. Repair sealants pulled from test area by applying new sealants following same procedures used to originally seal joints. Ensure that original sealant surfaces are clean and new sealant contacts original sealant.
- F. Evaluation of Field-Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements, will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.7 CLEANING:

- A. Fresh compound smeared on adjoining surfaces: Scrape off immediately and rub clean with a solvent as recommended by manufacturer of the adjacent material or if not otherwise indicated by the caulking or sealant manufacturer.
- B. Leave adjacent surfaces in a clean and unstained condition.

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**SECTION 09 97 13
COATINGS FOR STEEL**

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Furnish all labor, materials, tools and equipment and perform all Work necessary for and incidental to painting as shown on the Drawings and specified herein. This includes but is not limited to the following:
1. Cleaning, priming, and painting embedded steel structural members revealed by selective demolition of masonry.

1.2 RELATED WORK SPECIFIED ELSEWHERE

1. Section 04 12 10 - BRICK MASONRY REPAIR AND REPLACEMENT
2. Section 07 92 00 - JOINT SEALANTS

1.3 REFERENCES

1. ASTM International (ASTM)
2. ASTM D1186 - "Standard Method for Nondestructive Measurement of Dry Film Thickness (DFT) of Nonmagnetic Coatings Applied to a Ferrous Base"
3. ASTM D1212 - "Standard Test Methods for Measurement of Wet Film Thickness of Organic Coatings"
4. ASTM D3359 - "Standard Test Method for Measuring Adhesion by Tape Test"
5. ASTM D4541 - "Standard Test Method for Pull-off Strength of Coatings Using Portable Adhesion Testers"
 - a. Code of Federal Regulations:
 - 1) 40 CFR 59, Subpart D (EPA Method 24), Volatile Organic Compounds (VOC) content limitations
 - 2) 29 CFR 1910.1000-1500, Subpart Z, "Toxic and Hazardous Substances"
 - 3) 29 CFR 1910.134, toxic exposure limits
 - b. Federal Standard 313, "Material Safety Data Sheets - Preparation and Submission"
 - c. The Society for Protective Coatings (SSPC)
 - 1) SSPC-PA 1, Shop, Field, and Maintenance Painting of Steel
 - 2) SSPC-PA 2, Measurement of Dry Coating Thickness with Magnetic Gages
 - 3) SSPC-PA Guide 3, A Guide to Safety in Paint Application
 - 4) SSPC-SP 1, Solvent Cleaning
 - 5) SSPC-SP 2, Hand Tool Cleaning
 - 6) SSPC-SP 3, Power Tool Cleaning
 - 7) SSPC-SP 5/NACE No. 1, "White Metal Blast Cleaning"
 - 8) SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning"
 - 9) SSPC-SP 7/NACE No. 4, "Brush-Off Blast Cleaning"

10) SSPC-SP 10/NACE No. 2, "Near-White Blast Cleaning

11) SSPC-SP 11, Power Tool Cleaning to Bare Metal

1.4 SUBMITTALS

- A. Before Work begins, submit to COR five (5) copies the following information pertaining to materials to be provided, for approval:
 - 1. List of materials to be provided, identified by manufacturer's name, product name or stock number, and indicating surfaces to which they are to be applied. Maintain one copy of list where work is being performed.
 - 2. Manufacturer's product data sheets and manufacturer's safety data sheets for coatings and related materials, and other potentially hazardous materials as defined in Federal Standard 313.
 - 3. Manufacturer's mixing, handling, and application instructions for coatings and related materials.
 - 4. Schedule indicating significant dates such as delivery, removal, completion of shop work, finish completion, etc.
- B. Warranties agreed upon by the coating manufacturers, applicator, and Owner.
 - 1. Coating manufacturer's approved list of application equipment to be used on this project.
- C. Qualification Data: For contractor and personnel performing coating application:
 - 1. Written approval of applicator by the manufacturer of the specified coatings.
 - 2. List of projects similar to Work specified in this Section, completed in the past five years. Include description of each project, surface area, cost of the work, coating system description, and Owner contact with address and telephone number.
 - 3. Documentation that applicator has previously applied the specified manufacturer's coating system or similar systems in production quantities similar to this Project. Include list of such projects with description, surface area, coating system description, and Owner contact with address and telephone number.
 - 4. Documentation of how long applicator has been continuously in the coating application business under the current name and organization.
 - 5. Documentation that job foreman has a minimum of five years' experience as a foreman.

6. Documentation that painters have a minimum of three years' experience as applicators of coatings to steel.

- D. Manufacturer's samples for review of coating color and texture.
- E. Manufacturer's decoding information so field personnel can verify shelf lives and other coded information.

1.5 QUALITY ASSURANCE

- A. Architect/Engineer's Project Representatives: Architect/Engineer may assign Project representative(s) to help carry out Architect/Engineer's responsibilities at the Site, including observing progress and quality of portion of completed Work. Architect/Engineer's Project will observe progress and quality of completed Work
- B. Contractor Qualifications:
 - 1. Firm performing Work in this Section must be able to document capability of shop or field application of coating metals and experience with similar projects.
 - 2. Personnel performing Work in this Section must have a minimum of five years' experience in the preparation and coating of metals.
 - 3. Supervisory Personnel must have a minimum of three years' experience in supervising this type of Work. Apprentices shall be under direct supervision of an experienced supervisor.
- C. Field Quality Control: Work in place shall be subject to inspection testing. Work found to be unacceptable shall be replaced with new, acceptable work.
- D. Manufacturers: Materials shall be obtained from manufacturers who will, if required, send a qualified technical representative to the Project site, for the purposes of advising the Contractor of procedures and precautions for use of the materials.
 - 1. Do not apply coatings from different manufacturers to the same component. Provide materials that are not available from the manufacturer from sources recommended and approved in writing by the manufacturer.
- E. Review specifications for requirements affecting Work of this trade. Conflict between these specifications and coating manufacturer's requirements or specifications, or other pertinent specifications, shall be immediately brought to the attention of the COR in writing.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Packing, Shipping, Handling, and Unloading: Deliver materials to job site in original, new, and unopened packages and containers bearing the manufacturer's name and label, with name of material and color; brand name, stock number or brand code, and date of manufacture; contents by volume for major pigment and binder constituents; thinning and application instructions; safety label requirements; and batch numbers.
- B. Acceptance at Site: Damaged or deteriorated materials shall be clearly identified and not used on this Project. Promptly remove rejected and noncomplying materials from the premises.
- C. Storage and Protection: Store materials in tightly closed containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 40 deg Fahrenheit and not more than 90 deg Fahrenheit, unless required otherwise by manufacturer's instructions. Storage area shall be protected from exposure to direct sunlight, heat, sparks, flames, and weather.
 - 1. Maintain containers in clean condition, free of foreign materials and residue.
 - 2. Store containers so manufacturer's labels are clearly displayed.
 - 3. Remove rags and waste from storage areas daily.
- D. Waste Management and Disposal: Comply with applicable safety codes and regulations that govern the work, including Occupational Safety and Health Administration (OSHA) and Environmental Protection Agency (EPA) regulations covering waste and wastewater disposal and VOC content.

1.7 PROJECT CONDITIONS

- A. Equipment, material, and appliances required for completion of Work, shall be so located and operated as to provide for maximum efficiency, public safety, persons employed at the site, and to prevent damage to new and existing construction, in accordance with the Contractor's safety plan, OSHA, and applicable safety codes and regulations.
- B. Confine operations at Project site to areas permitted by laws, permits, contract, the Owner, and Contractor's safety plan.
- C. Assume full responsibility for protection and safekeeping of products stored on premises, and for their proper use.
- D. Provide COR with access to the Work.

- E. Where conditions are uncovered that is not anticipated by the specifications, notify COR in writing immediately, before repairs are initiated.
- F. Apply coatings when temperature of surfaces to be coated and surrounding air temperatures are between 50 and 95 deg Fahrenheit.
- G. Do not apply coatings in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg Fahrenheit above the dew point; or to damp or wet surfaces. Allowable minimum relative humidity shall be determined by the manufacturer.

1.8 WARRANTY

- A. The manufacturer and applicator shall jointly warrant that coating will not crack, check, peel, excessively chalk, or allow exterior water to penetrate the coating for a period of five (5) years. These coating failures shall be repaired/corrected within the warranty period at no cost to the Owner.

PART 2 PRODUCTS

2.1 GENERAL

- A. Select only those products whose manufacturers will have a representative visit the site periodically during the work.
- B. All materials such as linseed oil, turpentine, mineral spirits, etc. shall be pure and of the highest quality.

2.2 COATINGS FOR STEEL

- A. Paint for surfaces prepared according to SSPC SP-3 and SSPC SP-6, as well as exposed new galvanized steel surfaces:
 - 1. Tnemec
 - a. Two coats of Chembuild Series 135
 - b. One coat of Endura-Shield Series 73
 - c. Endura-Shield Series 73 shall be omitted on metal surfaces that will be embedded in masonry construction.
 - 2. Sherwin-Williams
 - a. Two coats of Macropoxy 646 SE
 - b. One coat of Hi-Solids Polyurethane 250
 - c. Hi-Solids Polyurethane 250 shall be omitted on metal surfaces that will be embedded in masonry construction.
 - 3. Or approved equal

PART 3 EXECUTION

3.1 PREPARATION

- A. Dust, dirt and all loose paint should be removed from surfaces to be painted in accordance with manufacturer recommendations.
- B. At existing metal elements embedded in masonry, prepare metal according to SSPC specification SP-3, Power Tool Cleaning.

3.2 INSTALLATION

- A. Contractor shall apply all coatings in strict accordance with the manufacturer's written instructions.
- B. Allow coatings to cure in accordance with manufacturer's recommendations before proceeding with masonry installation adjacent.

3.3 CLEAN UP

- A. As Work progresses remove excess material from the site.
- B. At the conclusion of work remove all scaffolding and equipment used in the Work, clean up all debris and surplus material and remove same from the premises.

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