SECTION 01 00 00
GENERAL REQUIREMENTS

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GENERAL REQUIREMENTS

1.1 GENERAL INTENTION

A. Contractor shall completely prepare site for building operations, including demolition and removal of existing structures, and furnish labor and materials and perform work for Renovation of the Meigs Lodge building located at Lebanon, Kentucky National Cemetery as required by drawings and specifications.

B. Offices of Smith Group and Tate Hill Jacobs: Architects, 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 RE/COTR or his duly authorized representative.

C. All employees of general contractor and subcontractors shall comply with VA security management program and obtain permission of the VA police, be identified by project and employer, and restricted from unauthorized access.

D. Prior to commencing work, general contractor shall provide proof that a OSHA certified "competent person" (CP) (29 CFR 1926.20(b)(2) will maintain a presence at the work site whenever the general or subcontractors are present.

E. Training:

1. All employees of general contractor or subcontractors shall have the 30-hour OSHA certified Construction Safety course and /or other relevant competency training, as determined by VA CP
2. Submit training records of all such employees for approval before the start of work.

1.2 STATEMENT OF BID ITEM(S)

A. ITEM I, Renovate Meigs Lodge Building: Work includes selective demolition for remodeling, general construction, walks, grading, drainage, and mechanical and electrical work.

B. ALTERNATE NO.1: <u>Interior Renovation work as specifed on the drawings</u>

1.3 SPECIFICATIONS AND DRAWINGS FOR CONTRACTOR

A. AFTER AWARD OF CONTRACT, 10 sets of specifications and drawings will be furnished. These drawings and specifications may consist of those returned by prospective bidders.

B. Additional sets of drawings may be made by the Contractor, at Contractor's expense, from Bond furnished by the Issuing Office.

1.4 CONSTRUCTION SECURITY REQUIREMENTS. Not used.

1.5 FIRE SAFETY

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

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

   E84-2009a.....Surface Burning Characteristics of Building Materials

2. National Fire Protection Association (NFPA):

   10-2010 .....Standard for Portable Fire Extinguishers

   30-2008 .....Flammable and Combustible Liquids Code

   51B-2009.....Standard for Fire Prevention During Welding, Cutting and Other Hot Work

   70-2008 .....National Electrical Code

   241-2009 .....Standard for Safeguarding Construction, Alteration, and Demolition Operations

3. Occupational Safety and Health Administration (OSHA):

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

B. Fire Safety Plan: Establish and maintain a fire protection program in accordance with 29 CFR 1926. Prior to start of work, prepare a plan detailing project-specific fire safety measures, including periodic status reports, and submit to RE/COTR/Cemetery Director for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES. Prior to any worker for the contractor or subcontractor’s beginning work, they shall undergo a safety briefing provided by the General Contractor’s competent person per OSHA requirements. This briefing shall include information on the construction limits, safety guidelines, means of egress, break areas, work hours, locations of restrooms, use of NCA equipment, etc.

Documentation shall be provided to the RE/COTR that individuals have undergone the Contractor's safety briefing.

C. Site and Building Access: Maintain free and unobstructed access to emergency services and for fire, police and other emergency response forces in accordance with NFPA 241.

D. Separate temporary facilities, such as trailers, storage sheds, and dumpsters, from existing buildings and new construction by distances in accordance with NFPA 241. For small facilities with less than 6 m (20 feet) exposing overall length, separate by 3m (10 feet).

E. Temporary Construction Partitions:

1. Install and maintain temporary construction partitions to provide for security and thermally insulated, weathertight conditions at all times.

F. Temporary Heating and Electrical: Install, use and maintain installations in accordance with 29 CFR 1926, NFPA 241 and NFPA 70.

G. Means of Egress: Do not block exiting for occupied buildings, including paths from exits to roads. Minimize disruptions and coordinate with RE/COTR/Cemetery Director.

H. Egress Routes for Construction Workers: Maintain free and unobstructed egress. Inspect daily. Report findings and corrective actions weekly to RE/COTR.

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

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

K. Smoke Detectors: Prevent accidental operation. Remove temporary covers at end of work operations each day. Coordinate with RE/COTR.

L. Hot Work: Perform and safeguard hot work operations in accordance with NFPA 241 and NFPA 51B. Coordinate with RE/COTR. Obtain permits from RE/COTR at least 24 hours in advance. Designate Contractor's responsible project-site fire prevention program manager to permit hot work.

M. Fire Hazard Prevention and Safety Inspections: Inspect entire construction areas weekly. Coordinate with, and report findings and corrective actions weekly to RE/COTR.

N. Smoking: Smoking is prohibited in and adjacent to construction areas inside existing buildings and additions under construction. In separate and detached buildings under construction, smoking is prohibited except in designated smoking rest areas.

O. Dispose of waste and debris in accordance with NFPA 241. Remove from buildings daily.

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

1.6 OPERATIONS AND STORAGE AREAS

A. The Contractor shall confine all operations (including storage of materials) on Government premises to areas authorized or approved by the RE/COTR. The Contractor shall hold and save the Government, its officers and agents, free and harmless from liability of any nature occasioned by the Contractor's performance.

B. Temporary buildings (e.g., storage trailers, office trailers) and utilities may be erected by the Contractor only with the approval of the RE/COTR and shall be built with labor and materials furnished by the Contractor without expense to the Government. The temporary buildings and utilities shall remain the property of the Contractor and shall be removed by the Contractor at its expense upon completion of the work. With the written consent of the RE/COTR, the buildings and utilities may be abandoned and need not be removed.

C. The Contractor shall, under regulations prescribed by the RE/COTR, use only established roadways, or use temporary roadways constructed by the Contractor when and as authorized by the RE/COTR. When materials are transported in prosecuting the work, vehicles shall not be loaded beyond the loading capacity recommended by the manufacturer of the vehicle or prescribed by any Federal, State, or local law or regulation. When it is necessary to cross curbs or sidewalks, the Contractor shall protect them from damage. The Contractor shall repair or pay for the repair of any damaged curbs, sidewalks, or roads. **(FAR 52.236-10)**

D. Working space and space available for storing materials shall be as determined by the RE/COTR.

E. Workmen are subject to rules of the Cemetery applicable to their conduct.

F. Execute work so as to interfere as little as possible with normal functioning of Cemetery as a whole, including operations of utility services, fire protection systems and any existing equipment, and with work being done by others.

1. Do not store materials and equipment in other than assigned areas.
2. Provide unobstructed access to the Cemetery and all areas required to remain in operation.
3. Where access by Cemetery personnel to vacated portions of buildings is not required, storage of Contractor's materials and equipment will be permitted subject to fire and safety requirements. All such actions shall be coordinated with the Utility Company involved:
   a. 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.

G. The building will be occupied during performance of work; but immediate areas of alterations will be vacated.
   1. The Contractor shall take all measures and provide all material necessary for protecting existing equipment and property in affected areas of construction against dust and debris, so that equipment and affected areas to be used in the Cemetery’s operations will not be hindered. The Contractor shall permit access to Department of Veterans Affairs personnel through other construction areas which serve as routes of access to such affected areas and equipment. Coordinate alteration work in areas occupied by Department of Veterans Affairs so that Cemetery operations will continue during the construction period.
   2. Immediate areas of alterations will be temporarily vacated while alterations are performed.
   3. If work of Bid Alternate #1 is accepted interior renovation work shall be phased in accordance with requirements stated in the drawings to minimize interference with Owner operations.

H. When any portion of the building is turned over to Contractor, Contractor shall accept entire responsibility therefore.
   1. The Contractor shall maintain a minimum temperature of 50 degrees F at all times, except as otherwise specified.

2. The Contractor shall maintain in operating condition existing fire protection and alarm equipment. In connection with fire alarm equipment, the Contractor shall make arrangements for pre-inspection of the site with Fire Department or Company (Department of Veterans Affairs or municipal) whichever will be required to respond to an alarm from the Contractor's employee.

I. Utilities Services: Maintain existing utility services for the Cemetery at all times. Provide temporary facilities, labor, materials, equipment, connections, and utilities to assure uninterrupted services. Where necessary to cut existing water, sewer or air pipes, or conduits, wires, cables, etc. of utility services or of fire protection systems and communications systems (including telephone), they shall be cut and capped at suitable places where shown; or, in absence of such indication, where directed by RE/COTR.

1. No utility service such as water, gas, steam, sewers or electricity, or fire protection systems and communications systems may be interrupted without prior approval of RE/COTR. Electrical work shall be accomplished with all affected circuits or equipment de-energized. When an electrical outage cannot be accomplished, work on any energized circuits or equipment shall not commence without the RE/COTR, and Cemetery Director’s prior knowledge and written approval. Refer to specification Sections 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS.
2. The Contractor shall submit a request to interrupt any such services to RE/COTR, and Cemetery Director, in writing, 48 hours in advance of proposed interruption. Request shall state reason, date, exact time of, and approximate duration of such interruption.
3. The 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 the Cemetery. Interruption time approved by the Cemetery may occur at other than Contractor's normal working hours.
4. Major interruptions of any system must be requested, in writing, at least 15 calendar days prior to the desired time and shall be performed as directed by the RE/COTR.
5. In case of a contract construction emergency, service will be interrupted on approval of RE/COTR. Such approval will be confirmed in writing as soon as practical.

6. Whenever it is required that a connection fee be paid to a public utility provider for new permanent service to the construction project, for such items as water, sewer, electricity, gas or steam, payment of such fee shall be the responsibility of the Government and not the Contractor.

J. Abandoned Lines: All service lines such as wires, cables, conduits, ducts, pipes and the like, and their hangers or supports, which are to be abandoned but are not required to be entirely removed, shall be sealed, capped or plugged. The lines shall not be capped in finished areas, but shall be removed and sealed, capped or plugged in ceilings, within furred spaces, in unfinished areas, or within walls or partitions; so that they are completely behind the finished surfaces.

K. To minimize interference of construction activities with flow of Cemetery traffic, comply with the following:

1. Keep roads, walks and entrances to grounds, to parking and to occupied areas of buildings clear of construction materials, debris and standing construction equipment and vehicles. Wherever excavation for new utility lines cross existing roads, at least one lane must be open to traffic at all times.
2. Method and scheduling of required cutting, altering and removal of existing roads, walks and entrances must be approved by the RE/COTR.

L. Coordinate the work for this contract with other construction operations as directed by RE/COTR. This includes the scheduling of traffic and the use of roadways, as specified in Article, USE OF ROADWAYS.

M. Coordination of Construction with Cemetery Director: The burial activities at a National Cemetery shall take precedence over construction activities. The Contractor must cooperate and coordinate with the Cemetery Director, through the RE/COTR, in arranging construction schedule to cause the least possible interference with Cemetery activities in actual burial areas. Construction noise during the interment services shall not disturb the service. Trucks and workmen shall not pass through the service area during this period:

1. The Contractor is required to discontinue his work sufficiently in advance of Easter Sunday, Mother's Day, Father's Day, Memorial Day, Veteran's Day and/or Federal

holidays, to permit him to clean up all areas of operation adjacent to existing burial plots before these dates.

2. Cleaning up shall include the removal of all equipment, tools, materials and debris and leaving the areas in a clean, neat condition.

1.7 ALTERATIONS

A. Survey: Before any work is started, the Contractor shall make a thorough survey with the RE/COTR of areas in which alterations occur and areas which are anticipated routes of access, and furnish a report, signed by to the Contracting Officer. This report shall list by rooms and spaces:

1. Existing condition and types of resilient flooring, doors, windows, walls and other surfaces not required to be altered throughout affected areas of building.
2. Existence and conditions of items such as plumbing fixtures and accessories, electrical fixtures, equipment, venetian blinds, shades, etc., required by drawings to be either reused or relocated, or both.
3. Shall note any discrepancies between drawings and existing conditions at site.
4. Shall designate areas for working space, materials storage and routes of access to areas within buildings where alterations occur and which have been agreed upon by Contractor and RE/COTR.

B. Any items required by drawings to be either reused or relocated or both, found during this survey to be nonexistent, or in opinion of RE/COTR, to be in such condition that their use is impossible or impractical, shall be furnished and/or replaced by the Contractor with new items in accordance with specifications which will be furnished by the Government. Provided the contract work is changed by reason of this subparagraph B, the contract will be modified accordingly, under provisions of clause entitled "DIFFERING SITE CONDITIONS" (FAR 52.236-2) and "CHANGES" (FAR 52.243-4 and VAAR 852.236-88).

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

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

D. Protection: Provide the following protective measures:

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

1.8 ENVIRONMENTAL CONTROLS

A. In general, following preventive measures shall be adopted during construction to keep down dust and prevent mold.

1. Dampen debris to keep down dust and provide temporary construction partitions in existing structures where directed by RE/COTR. Block off ducts and diffusers to prevent circulation of dust into occupied areas during construction.

B. Vacuum and wet mop all transition areas from construction to the occupied Cemetery buildings at the end of each workday.

C. Final Cleanup:

1. Upon completion of the 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. All new air ducts shall be cleaned prior to final inspection.

1.9 DISPOSAL AND RETENTION

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

1. Reserved items which are to remain property of the Government shall be identified by the RE/COTR prior to commencement of the work as items to be stored. Items that

remain property of the Government shall be removed or dislodged from present locations in such a manner as to prevent damage which would be detrimental to re-installation and reuse. Store such items where directed by RE/COTR.

2. Items not reserved shall become property of the Contractor and be removed by Contractor from the Cemetery.
3. Items of portable equipment and furnishings located in rooms and spaces in which work is to be done under this contract shall remain the property of the Government. When rooms and spaces are vacated by the Department of Veterans Affairs during the alteration period, such items which are NOT required by drawings and specifications to be either relocated or reused will be removed by the Government in advance of work to avoid interfering with Contractor's operation.
4. PCB Transformers and Capacitors: The Contractor shall be responsible for disposal of the Polychlorinated Biphenyl (PCB) transformers and capacitors. The transformers and capacitors shall be taken out of service and handled in accordance with the procedures of the Environmental Protection Agency (EPA) and the Department of Transportation (DOT) as outlined in Code of Federal Regulation (CFR), Titled 40 and 49 respectively. The EPA's Toxic Substance Control Act (TSCA) Compliance Program Policy Nos. 6-PCB-6 and 6-PCB-7 also apply. Upon removal of PCB transformers // and capacitors // for disposal, the "originator" copy of the Uniform Hazardous Waste Manifest (EPA Form 8700-22), along with the Uniform Hazardous Waste Manifest Continuation Sheet (EPA Form 8700-22A) shall be returned to the RE/COTR who will annotate the contract file and transmit the Manifest to the Cemetery's Director.
    a. Copies of the following listed CFR titles may be obtained from the Government Printing Office:

       40 CFR 261 .....Identification and Listing of Hazardous Waste
       40 CFR 262 .....Standards Applicable to Generators of Hazardous Waste
       40 CFR 263 .....Standards Applicable to Transporters of Hazardous Waste
       40 CFR 761 .....PCB Manufacturing, Processing, Distribution in Commerce, and use Prohibitions

49 CFR 172 .....Hazardous Material tables and Hazardous Material Communications Regulations

49 CFR 173 .....Shippers - General Requirements for Shipments and Packaging

49 CRR 173 .....Subpart A General

49 CFR 173 .....Subpart B Preparation of Hazardous Material for Transportation

49 CFR 173 .....Subpart J Other Regulated Material; Definitions and Preparation

TSCA .....Compliance Program Policy Nos. 6-PCB-6 and 6-PCB-7

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

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

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 RE/COTR may have the necessary work performed and charge the cost to the Contractor. **(FAR 52.236-9)**

C. Refer to Section 01 57 19, TEMPORARY ENVIRONMENTAL CONTROLS, for additional requirements on protecting vegetation, soils and the environment. Refer to

Articles, "Alterations", "Restoration", and "Operations and Storage Areas" for additional instructions concerning repair of damage to structures and site improvements.

1.11 RESTORATION

A. Remove, cut, alter, replace, patch and repair existing work as necessary to install new work. Except as otherwise shown or specified, do not cut, alter or remove any structural work, and do not disturb any ducts, plumbing, steam, gas, or electric work without approval of the RE/COTR. Existing work to be altered or extended and that is found to be defective in any way, shall be reported to the RE/COTR before it is disturbed. Materials and workmanship used in restoring work, shall conform in type and quality to that of original existing construction, except as otherwise shown or specified.

B. Upon completion of contract, deliver work complete and undamaged. Existing work (walls, ceilings, partitions, floors, mechanical and electrical work, lawns, paving, roads, walks, etc.) disturbed or removed as a result of performing required new work, shall be patched, repaired, reinstalled, or replaced with new work, and refinished and left in as good condition as existed before commencing work.

C. At the Contractor's own expense, the Contractor shall immediately restore to service and repair any damage caused by the Contractor's workmen to existing piping and conduits, wires, cables, etc., of utility services or of fire protection systems and communications systems (including telephone) which are indicated on drawings and which are not scheduled for discontinuance or abandonment.

D. Expense of repairs to such utilities and systems not shown on drawings or locations of which are unknown will be covered by adjustment to contract time and price in accordance with clause entitled "CHANGES" (FAR 52.243-4 and VAAR 852.236-88) and "DIFFERING SITE CONDITIONS" (FAR 52.236-2).

1.12 PHYSICAL DATA Not used.

1.13 PROFESSIONAL SURVEYING SERVICES Not used.

1.14 LAYOUT WORK Not used.

1.15 AS-BUILT DRAWINGS

A. The Contractor shall maintain two full size sets of as-built drawings which will be kept current during construction of the project, which will include all contract changes, modifications and clarifications.

B. All variations shall be shown in the same general detail as used in the contract drawings. To insure compliance, as-built drawings shall be made available for the RE/COTR's review, as often as requested.

C. The Contractor shall deliver two approved completed sets of as-built drawings to the RE/COTR within 15 calendar days after each completed phase and after the acceptance of the project by the RE/COTR.

D. Paragraphs A, B, & C shall also apply to all shop drawings.

1.16 USE OF ROADWAYS

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

1.17 RE/COTR'S FIELD OFFICE Not used.

1.18 TEMPORARY USE OF MECHANICAL AND ELECTRICAL EQUIPMENT

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

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

1.19 TEMPORARY TOILETS

A. Provide where directed, (for use of all Contractor's workmen) ample temporary sanitary toilet accommodations with suitable sewer and water connections, or when approved by RE/COTR provide suitable dry closets where directed. Keep such places clean and free from flies, and all connections and appliances connected therewith are to be removed prior to completion of contract, and premises left perfectly clean.

1.20 AVAILABILITY AND USE OF UTILITY SERVICES

A. The Government shall make all reasonably required amounts of utilities available to the Contractor from existing outlets and supplies, as specified in the contract. The amount to be paid by the Contractor for chargeable electrical services shall be the prevailing rates

charged to the Government. The Contractor shall carefully conserve any utilities furnished without charge.

B. The Contractor, at Contractor's expense and in a workmanlike manner satisfactory to the RE/COTR, shall install and maintain all necessary temporary connections and distribution lines, and all meters required to measure the amount of electricity used for the purpose of determining charges. Before final acceptance of the work by the Government, the Contractor shall remove all the temporary connections, distribution lines, meters, and associated paraphernalia.

E. Electricity (for Construction): Furnish all temporary electric services.

1. Obtain electricity by connecting to the Cemetery electrical distribution system. The Owner will pay the cost of electrical service. Where not available the contractor shall supply power via portable generators at own expense.

F. Water (for Construction): Furnish temporary water service.

1. Obtain water by connecting to the Cemetery water distribution system. Provide reduced pressure backflow preventer at each connection. Water is available at no cost to the Contractor.
2. Maintain connections, pipe, fittings and fixtures and conserve water-use so none is wasted. Failure to stop leakage or other wastes will be cause for revocation (at RE/COTR's discretion) of use of water from the Cemetery's system.

1.21 NEW TELEPHONE EQUIPMENT Not used.

1.22 TESTS

A. Pre-test mechanical and electrical equipment and systems and make corrections required for proper operation of such systems before requesting final tests. Final test will not be conducted unless pre-tested.

B. Conduct final tests required in various sections of specifications in presence of an authorized representative of the RE/COTR. Contractor shall furnish all labor, materials, equipment, instruments, and forms, to conduct and record such tests.

C. Mechanical and electrical systems shall be balanced, controlled and coordinated. A system is defined as the entire complex which must be coordinated to work together during normal operation to produce results for which the system is designed. For example, air conditioning supply; air is only one part of entire system which provides

comfort conditions for a building. Other related components are return air, exhaust air, hot water, controls and electricity, etc. Another example of a complex which involves several components of different disciplines is a burner installation. Efficient and acceptable burner operation depends upon the coordination and proper operation of fuel, combustion air, controls, and other related components.

D. All related components as defined above shall be functioning when any system component is tested. Tests shall be completed within a reasonably short period of time during which operating and environmental conditions remain reasonably constant.

E. Individual test result of any component, where required, will only be accepted when submitted with the test results of related components and of the entire system.

1.23 INSTRUCTIONS

A. The Contractor shall furnish Maintenance and Operating manuals and verbal instructions when required by the various sections of the specifications and as hereinafter specified.

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

C. Instructions: the Contractor shall provide qualified, factory-trained manufacturers' representatives to give detailed instructions to assigned Department of Veterans Affairs personnel in the operation and complete maintenance for each piece of equipment. All

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

1.24 GOVERNMENT-FURNISHED PROPERTY Not used.

1.25 RELOCATED ITEMS

A. Contractor shall disconnect, dismantle as necessary, remove and reinstall in new location, all existing equipment and items shown to be relocated by the Contractor.

B. Perform relocation of such equipment or items at such times and in such a manner as directed by the RE/COTR.

C. Suitably cap existing service lines, such as water, drain, gas, air, and/or electrical, whenever such lines are disconnected from equipment to be relocated. Remove abandoned lines in finished areas and cap as specified herein before under paragraph "Abandoned Lines".

D. Provide all mechanical and electrical service connections, fittings, fastenings and any other materials necessary for assembly and installation of relocated equipment; and leave such equipment in proper operating condition.

E. All service lines such as noted above for relocated equipment shall be in place at point of relocation ready for use before any existing equipment is disconnected. Make relocated existing equipment ready for operation or use immediately after reinstallation.

1.26 CONSTRUCTION SIGN None required and None allowed

1.27 SAFETY SIGN Not used.

1.28 CONSTRUCTION DIGITAL IMAGES

A. During the construction period through completion, furnish Department of Veterans Affairs with 100 views of digital images, including one color print of each view and one Compact Disc (CD) per visit containing those views taken on that visit. Digital views shall be taken of exterior and/or interior as selected and directed by RE/COTR (RE). Each view shall be taken with a professional grade camera with minimum size of 6 megapixels (MP) as per these specifications:

1. Normally such images will be taken at monthly intervals. However, the RE/COTR may also direct the taking of special digital images at any time prior to completion and acceptance of contract. If the number of trips to the site exceeds an average of one per month of the contract performance period then an adjustment in contract price will be made in accordance with clause entitled "CHANGES" (FAR 52.243-4 and VAAR 852.236-88) of Section 00 72 00, GENERAL CONDITIONS.
2. In event a greater or lesser number of images than specified above are required by the RE/COTR, adjustment in contract price will be made in accordance with clause entitled "CHANGES" (FAR 52.243-4 and VAAR 852.236-88).

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

D Interior Final Photos: After completion of all work in an area final interior photos will be taken. The camera must allow the colors to be as close as possible to the actual colors. View shall be taken after final completion of work. The images shall also be provided on a CD to the RE Office.

1.29 FINAL ELEVATION DIGITAL IMAGES

A. A minimum of four (4) images of each elevation shall be taken with a minimum 6 MP camera. All images are provided to the RE on a CD.

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

1.30 HISTORIC PRESERVATION

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

1.31 PROJECT HEALTH AND SAFETY PLAN

A. Prior to commencing any construction, the Contractor shall submit a site specific Project Health and Safety Plan (PHSP). At a minimum, the PHSP shall cover the following topics:

1. Organizational structure (including Responsible Persons)
2. Site Characterization and Job Hazard Identification
3. Site Control and Security
4. Training
5. Medical Surveillance
6. PPE
7. Exposure Monitoring
8. Heat Stress9
9. Spill Containment
10. Decontamination
11. Emergency Response
12. Confined Spaces
13. Hosting Operations
14. Trench Safety
15. Lockout/Tagout

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SECTION 01 33 23
SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

1-1. Refer to Articles titled SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION (FAR 52.236-21) and, SPECIAL NOTES (VAAR 852.236-91), in GENERAL CONDITIONS.

1-2. For the purposes of this contract, samples(including laboratory samples to be tested, test reports, certificates, and manufacturers' literature and data shall also be subject to the previously referenced requirements. The following text refers to all items collectively as SUBMITTALS.

1-3. Submit for approval, all of the items specifically mentioned under the separate sections of the specification, with information sufficient to evidence full compliance with contract requirements. Materials, fabricated articles and the like to be installed in permanent work shall equal those of approved submittals. After an item has been approved, no change in brand or make will be permitted unless:

A. Satisfactory written evidence is presented to, and approved by Contracting Officer, that manufacturer cannot make scheduled delivery of approved item or;
B. Item delivered has been rejected and substitution of a suitable item is an urgent necessity or;
C. Other conditions become apparent which indicates approval of such substitute item to be in best interest of the Government.

1-4. Forward submittals in sufficient time to permit proper consideration and approval action by Government. Time submission to assure adequate lead time for procurement of contract - required items. Delays attributable to untimely and rejected submittals(including any laboratory samples to be tested) will not serve as a basis for extending contract time for completion.

1-5. Submittals will be reviewed for compliance with contract requirements by Architect-Engineer, and action thereon will be taken by Resident Engineer on behalf of the Contracting Officer.

1-6. Upon receipt of submittals, Architect-Engineer will assign a file number thereto. Contractor, in any subsequent correspondence, shall refer to this file and identification number to expedite replies relative to previously approved or disapproved submittals.

1-7. The Government reserves the right to require additional submittals, whether or not particularly mentioned in this contract. If additional

submittals beyond those required by the contract are furnished pursuant to request therefor by Contracting Officer, adjustment in contract price and time will be made in accordance with Articles titled CHANGES (FAR 52.243-4) and CHANGES - SUPPLEMENT (VAAR 852.236-88) of the GENERAL CONDITIONS.

1-8. Schedules called for in specifications and shown on shop drawings shall be submitted for use and information of Department of Veterans Affairs and Architect-Engineer. However, the Contractor shall assume responsibility for coordinating and verifying schedules. The Contracting Officer and Architect- Engineer assumes no responsibility for checking schedules or layout drawings for exact sizes, exact numbers and detailed positioning of items.

1-9. Submittals must be submitted by Contractor only and shipped prepaid. Contracting Officer assumes no responsibility for checking quantities or exact numbers included in such submittals.

A. Submit samples required by Section 09 06 00, SCHEDULE FOR FINISHES, in quadruplicate. Submit other samples in single units unless otherwise specified. Submit shop drawings, schedules, manufacturers' literature and data, and certificates in quadruplicate, except where a greater number is specified.

B. Submittals will receive consideration only when covered by a transmittal letter signed by Contractor. Letter shall be sent via first class mail and shall contain the list of items, name of Cemetery, name of Contractor, contract number, applicable specification paragraph numbers, applicable drawing numbers (and other information required for exact identification of location for each item), manufacturer and brand, ASTM or Federal Specification Number (if any) and such additional information as may be required by specifications for particular item being furnished. In addition, catalogs shall be marked to indicate specific items submitted for approval.

1. A copy of letter must be enclosed with items, and any items received without identification letter will be considered "unclaimed goods" and held for a limited time only.
2. Each sample, certificate, manufacturers' literature and data shall be labeled to indicate the name and location of the Cemetery, name of Contractor, manufacturer, brand, contract number and ASTM or Federal Specification Number as applicable and location(s) on project.
3. Required certificates shall be signed by an authorized representative of manufacturer or supplier of material, and by Contractor.

C. In addition to complying with the applicable requirements specified in preceding Article 1.9, samples which are required to have Laboratory Tests (those preceded by symbol "LT" under the separate sections of the specification shall be tested, at the expense of Contractor, in a commercial laboratory approved by Contracting Officer.
   1. Laboratory shall furnish Contracting Officer with a certificate stating that it is fully equipped and qualified to perform intended work, is fully acquainted with specification requirements and intended use of materials and is an independent establishment in no way connected with organization of Contractor or with manufacturer or supplier of materials to be tested.
   2. Certificates shall also set forth a list of comparable projects upon which laboratory has performed similar functions during past five years.
   3. Samples and laboratory tests shall be sent directly to approved commercial testing laboratory.
   4. Contractor shall send a copy of transmittal letter to both Resident Engineer and to Architect-Engineer simultaneously with submission of material to a commercial testing laboratory.
   5. Laboratory test reports shall be sent directly to Resident Engineer for appropriate action.
   6. Laboratory reports shall list contract specification test requirements and a comparative list of the laboratory test results. When tests show that the material meets specification requirements, the laboratory shall so certify on test report.
   7. Laboratory test reports shall also include a recommendation for approval or disapproval of tested item.

D. If submittal samples have been disapproved, resubmit new samples as soon as possible after notification of disapproval. Such new samples shall be marked "Resubmitted Sample" in addition to containing other previously specified information required on label and in transmittal letter.

E. Approved samples will be kept on file by the Resident Engineer at the site until completion of contract, at which time such samples will be delivered to Contractor as Contractor's property. Where noted in technical sections of specifications, approved samples in good condition may be used in their proper locations in contract work. At completion of contract, samples that are not approved will be returned to Contractor only upon request and at Contractor's expense. Such request should be made prior to completion of the contract. Disapproved samples that are not requested for return by Contractor will be discarded after completion of contract.

F. Submittal drawings (shop, erection or setting drawings) and schedules, required for work of various trades, shall be checked before submission by technically qualified employees of Contractor for accuracy, completeness and compliance with contract requirements. These drawings and schedules shall be stamped and signed by Contractor certifying to such check.

1. For each drawing required, submit one legible photographic paper or vellum reproducible.
2. Reproducible shall be full size.
3. Each drawing shall have marked thereon, proper descriptive title, including Cemetery location, project number, manufacturer's number, reference to contract drawing number, detail Section Number, and Specification Section Number.
4. A space 120 mm by 125 mm (4-3/4 by 5 inches) shall be reserved on each drawing to accommodate approval or disapproval stamp.
5. Submit drawings, ROLLED WITHIN A MAILING TUBE, fully protected for shipment.
6. One reproducible print of approved or disapproved shop drawings will be forwarded to Contractor.
7. When work is directly related and involves more than one trade, shop drawings shall be submitted to Architect-Engineer under one cover.

1-10. Samples (except laboratory samples), shop drawings, test reports, certificates and manufacturers' literature and data, shall be submitted for approval to

TATE HILL JACOBS ARCHITECTS
346 East Main Street
Lexington, KY 40507

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SECTION 01 42 19
REFERENCE STANDARDS

PART 1 - GENERAL

1.1 DESCRIPTION

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)

The specifications and standards cited in this solicitation can be examined at the following location:

DEPARMENT OF VETERANS AFFAIRS
Office of Construction & Facilities Management
Facilities Quality Service (00CFM1A)
811 Vermont Avenue, NW - Room 462
Washington, DC 20420

Telephone Number: (202) 461-8217

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
http://www.aabchq.com

AAMA American Architectural Manufacturer's Association
http://www.aamanet.org

AAN American Nursery and Landscape Association
http://www.anla.org

AASHTO American Association of State Highway and Transportation Officials
http://www.aashto.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

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 http://www.aitc-glulam.org
ANLA	American Nursery & Landscape Association http://www.anla.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
ASAE	American Society of Agricultural Engineers http://www.asae.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 http://www.asse-plumbing.org
ASTM	American Society for Testing and Materials http://www.astm.org
AWI	Architectural Woodwork Institute http://www.awinet.org

AWS	American Welding Society http://www.aws.org
AWWA	American Water Works Association http://www.awwa.org
BHMA	Builders Hardware Manufacturers Association http://www.buildershardware.com
BIA	Brick Institute of America http://www.bia.org
CAGI	Compressed Air and Gas Institute http://www.cagi.org
CGA	Compressed Gas Association, Inc. http://www.cganet.com
CISCA	Ceilings and Interior Systems Construction Association http://www.cisca.org
CISPI	Cast Iron Soil Pipe Institute http://www.cispi.org
CLFMI	Chain Link Fence Manufacturers Institute http://www.chainlinkinfo.org
CRA	California Redwood Association http://www.calredwood.org
CRSI	Concrete Reinforcing Steel Institute http://www.crsi.org
DHI	Door and Hardware Institute http://www.dhi.org
EGSA	Electrical Generating Systems Association http://www.egsa.org
EEI	Edison Electric Institute http://www.eei.org
EPA	Environmental Protection Agency http://www.epa.gov

ETL	ETL Testing Laboratories, Inc. http://www.et1.com
FCC	Federal Communications Commission http://www.fcc.gov
FPS	The Forest Products Society http://www.forestprod.org
GANA	Glass Association of North America http://www.cssinfo.com/info/gana.html/
FM	Factory Mutual Insurance http://www.fmglobal.com
GA	Gypsum Association http://www.gypsum.org
GSA	General Services Administration http://www.gsa.gov
HI	Hydraulic Institute http://www.pumps.org
HPVA	Hardwood Plywood & Veneer Association http://www.hpva.org
ICBO	International Conference of Building Officials http://www.icbo.org
ICEA	Insulated Cable Engineers Association Inc. http://www.icea.net
IEEE	Institute of Electrical and Electronics Engineers http://www.ieee.org\
NBMA	Metal Buildings Manufacturers Association http://www.mbma.com
NAAMM	National Association of Architectural Metal Manufacturers http://www.naamm.org
NAPHCC	Plumbing-Heating-Cooling Contractors Association http://www.phccweb.org.org

NBS	National Bureau of Standards
	See - NIST
NEC	National Electric Code
	See - NFPA National Fire Protection Association
NEMA	National Electrical Manufacturers Association
	http://www.nema.org
NFPA	National Fire Protection Association
	http://www.nfpa.org
NHLA	National Hardwood Lumber Association
	http://www.natlhardwood.org
NIH	National Institute of Health
	http://www.nih.gov
NIST	National Institute of Standards and Technology
	http://www.nist.gov
NLMA	Northeastern Lumber Manufacturers Association, Inc.
	http://www.nelma.org
NPA	National Particleboard Association
	18928 Premiere Court
	Gaithersburg, MD 20879
	(301) 670-0604
NSF	National Sanitation Foundation
	http://www.nsf.org
NWWDA	Window and Door Manufacturers Association
	http://www.nwwda.org
OSHA	Occupational Safety and Health Administration
	Department of Labor
	http://www.osha.gov
PCA	Portland Cement Association
	http://www.portcement.org

PCI	Precast Prestressed Concrete Institute http://www.pci.org
PPI	The Plastic Pipe Institute http://www.plasticpipe.org
PEI	Porcelain Enamel Institute, Inc. http://www.porcelainenamel.com
PTI	Post-Tensioning Institute http://www.post-tensioning.org
RFCI	The Resilient Floor Covering Institute http://www.rfci.com
RIS	Redwood Inspection Service See - CRA
RMA	Rubber Manufacturers Association, Inc. http://www.rma.org
SCMA	Southern Cypress Manufacturers Association http://www.cypressinfo.org
SDI	Steel Door Institute http://www.steeldoor.org
IGMA	Insulating Glass Manufacturers Alliance http://www.igmaonline.org
SJI	Steel Joist Institute http://www.steeljoist.org
SMACNA	Sheet Metal and Air-Conditioning Contractors National Association, Inc. http://www.smacna.org
SSPC	The Society for Protective Coatings http://www.sspc.org
STI	Steel Tank Institute http://www.steeltank.com

SWI	Steel Window Institute
	http://www.steelwindows.com
TCA	Tile Council of America, Inc.
	http://www.tileusa.com
TPI	Truss Plate Institute, Inc.
	583 D'Onofrio Drive; Suite 200
	Madison, WI 53719
	(608) 833-5900
UBC	The Uniform Building Code
	See ICBO
UL	Underwriters' Laboratories Incorporated
	http://www.ul.com
ULC	Underwriters' Laboratories of Canada
	http://www.ulc.ca
WCLIB	West Coast Lumber Inspection Bureau
	6980 SW Varns Road, P.O. Box 23145
	Portland, OR 97223
	(503) 639-0651
WRCLA	Western Red Cedar Lumber Association
	P.O. Box 120786
	New Brighton, MN 55112
	(612) 633-4334
WWPA	Western Wood Products Association
	http://www.wwpa.org

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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, and solid waste, as well as other pollutants and resources encountered or generated by the Contractor. The Contractor is obligated to consider specified control measures with the costs included within the various contract items of work.

B. Environmental pollution and damage is defined as the presence of chemical, physical, or biological elements or agents which:
   1. Adversely effect human health or welfare.
   2. Unfavorably alter ecological balances of importance to human life.
   3. Effect other species of importance to humankind.
   4. Degrade the utility of the environment for aesthetic, cultural, and historical purposes.

1.2 DEFINITIONS OF POLLUTANTS

A. Chemical Waste: Petroleum products, bituminous materials, salts, acids, alkalis, herbicides, pesticides, organic chemicals, and inorganic wastes.

B. Debris: Combustible and noncombustible wastes, such as leaves, tree trimmings, ashes, and waste materials resulting from construction or maintenance and repair work.

C. Sediment: Soil and other debris that has been eroded and transported by runoff water.

D. Solid Waste: Rubbish, debris, garbage, and other discarded solid materials resulting from project construction activities.

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

F. Rubbish: Combustible and noncombustible wastes such as, but not limited to, paper, plastic, metal and plastic containers and cans, boxes, metal and lumber scrap, .

G. Sanitary Wastes:
   a. Sewage: Domestic sanitary sewage and human and animal waste.

b. Garbage: Refuse and scraps resulting from preparation, cooking, dispensing, and consumption of food.

1.3 QUALITY CONTROL

A. Contractor shall establish and maintain quality control for the environmental protection of all items set forth herein.

B. Contractor shall record on daily reports any problems in complying with laws, regulations, ordinances and note any corrective action taken.

1.4 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, Waters of the United States.

C. Federal Environmental Regulatory Requirements: Comply with applicable regulations. The following is for Contractor's information only:

1. Storm water permits; refer to The Office of Wastewater Management, NPDES Storm Water Program: http://www.epa.gov/npdes/stormwater
2. Dredge and fill (Section 404) permits; refer to U.S. EPA Office of Wetlands, Oceans, and Watersheds (OWOW): http://www.epa.gov/owow/
3. RCRA hazardous and non-hazardous solid waste requirements; refer to EPA’s Office of Solid Waste and Emergency Response: http://www.epa.gov/epaoswer/osw/laws-reg.htm
4. Oil spill requirements for construction activities; refer to EPA Oil Program web site: http://www.epa.gov/oilspill/
5. Hazardous substances (Superfund Liability) requirements for construction activities; refer to EPA’s Superfund website: http://www.epa.gov/superfund/index.htm
6. Polychlorinated Biphenyl (PCB) waste requirements; refer to EPA’s Polychlorinated Biphenyl (PCB) Homepage: http://www.epa.gov/pcb/
7. Air quality requirements for construction activities; refer to EPA’S Air Program Mobile Sources Page: http://www.epa.gov/ebtpages/airmobilesources.html
8. Asbestos requirements for construction activities; refer to EPA’s Asbestos Management and Regulatory Requirements Website: http://www.epa.gov/fedsite/cd/asbestos.html
9. National Environmental Policy Act (NEPA) requirements for construction activities
10. Endangered Species Act; refer to The US Fish and Wildlife Service Endangered Species Program: http://endangered.fws.gov/

11. National Historic Preservation Act

C. State and Local Environmental Regulatory Requirements: Comply with applicable regulations. The following is for Contractor's information only:
   1. State Office/Department of Environmental Quality.
   2. Local Office/Department of Environmental Quality.
   3. The Construction Industry Compliance Assistance Center: http://www.cicacenter.org/index.cfm
   4. The National Environmental Compliance Assistance Clearinghouse: http://cfpub.epa.gov/clearinghouse/

1.5 SUBMITTALS

A. In accordance with Section, 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES, the Contractor shall furnish the following:
   1. Environmental Protection Plan: After the contract is awarded and prior to the commencement of the work, the Contractor shall meet with the Resident Engineer/COTR 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 Resident Engineer/COTR for approval, a written and/or graphic Environmental Protection Plan including, but not limited to, the following:
      a. Name(s) and qualifications of person(s) within the Contractor's organization who is (are) responsible for:
         i. ensuring adherence to the Environmental Protection Plan.
         ii. Manifesting hazardous waste to be removed from the site.
         iii. Training the Contractor's environmental protection personnel.
      b. Description of the Contractor's environmental protection personnel training program.
      c. 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.
      d. 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.

e. Procedures to provide environmental protection that complies 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.

f. Permits, licenses, and the location of the solid waste disposal area.

g. Work Area Plan showing the proposed activity in each portion of the area and identifying the areas of construction limits or protected areas. Plan should include measures for marking the limits of use areas. This plan may be incorporated within the Erosion Control Plan.

B. Within 20 days after the date of its submittal, the Resident Engineer/COTR shall approve the Contractor’s Comprehensive Environmental Protection Plan, or respond with an explanation for its rejection and resubmittal.

C. 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.

1.6.PROTECTION OF ENVIRONMENTAL RESOURCES

A. Protect environmental resources within the project boundaries and those affected outside the limits of permanent work during the duration of this contract. Confine construction activities to areas defined by construction limits, the specifications and drawings.

B. Protection of Land Resources: Prior to construction, identify all land resources to be preserved within the work area. Do not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, top soil, land forms, wetlands or wetland buffers without prior approval from the Resident Engineer/COTR. Do not fasten or attach ropes, cables, or guys to trees for anchorage unless specifically authorized, or dictated by special emergency use.

1. Work Area Limits: Prior to any construction, mark/fence/protect the areas that require work to be performed under this contract. Mark/fence/protect monuments, works of art, and markers prior to construction. Convey to all personnel the purpose of marking and protecting all marked and protected objects.

2. Protection of Specific Regulated Elements: Landscape features to be preserved by marking, fencing, or using any other approved protective techniques.

a. Protect trees and shrubs to remain on site to protect from damage.
b. All damage to existing trees and shrubs shall be immediately repaired 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 only as needed to use to work the area to be developed. Form earthwork to final grade as shown as quickly as possible to minimize potential erosion damage. Immediately protect side slopes and back slopes upon completion of rough grading or clearing with appropriate material as defined in the Sediment and Erosion Control Plan.
4. Erosion and Sedimentation Control Devices: Construct or install all temporary erosion and sedimentation control features. 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.
5. Manage and control borrow and spoil areas on Government property to minimize erosion and to prevent soil and/or sediment from entering nearby water courses or lakes.
6. Protect adjacent areas from despoilment by temporary excavations and embankments.
7. 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.
8. Store chemical waste away from the work areas in corrosion resistant containers and dispose of waste in accordance with Federal, State, and local regulations.
9. Handle discarded materials other than those included in the solid waste category as directed by the Resident Engineer/COTR.

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 sediment basins prior to entering retention/detention ponds, allowing the suspended material to settle, the pollutants to separate, or the water to evaporate.

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 protected species that require specific attention along with measures for their protection.

E. Protection of Air Resources: Keep construction activities under surveillance, management, and control to minimize pollution of air resources. Burning is not permitted on the job site. Keep activities, equipment, processes, and work operated or performed, in strict accordance with the State of Kentucky requirements and Federal emission and performance laws and standards. Maintain ambient air quality standards set by the Environmental Protection Agency, for those construction operations and activities specified.

1. Particulates: Control dust particles, aerosols, and gaseous by-products from all construction activities, processing, and preparation of materials //from asphaltic batch plants if onsite, or other onsite material processing operations// at all times, including weekends, holidays, and hours when work is not in progress.
2. Particulates Control: Maintain all excavations, stockpiles, haul roads, permanent and temporary access roads, spoil areas, borrow areas, and all other work areas within or outside the project boundaries free from particulates which would cause a hazard or a nuisance. Sprinklering, chemical treatment of an approved type, light bituminous treatment, or other methods are permitted to control particulates in the work area as approved in the Environmental Protection Plan.
3. Hydrocarbons and Carbon Monoxide: Control monoxide emissions from equipment to Federal and State allowable limits.
4. Odors: Control odors of construction activities and prevent obnoxious odors from occurring.

F. Noise Control: Minimize noise using every action possible. Perform noise-producing work in less sensitive hours of the day or week as

directed by the Resident Engineer/COTR. 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 before 4:00 p.m. or after 8:00 a.m. unless otherwise permitted by local ordinance or the Resident Engineer/COTR. 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

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 as approved by the Resident Engineer/COTR. Cleaning shall include off-cemetery 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, clearing, logging and general construction in accordance with state and local regulations and the contract.

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SECTION 01 74 19
CONSTRUCTION WASTE MANAGEMENT

PART 1 – GENERAL

1.1 DESCRIPTION

A. This section specifies the requirements for the management of non-hazardous building construction and demolition waste.

B. Waste disposal in landfills shall be minimized to the greatest extent possible. Of the inevitable waste that is generated, as much of the waste material as economically feasible shall be salvaged, recycled or reused.

C. Contractor shall use all reasonable means to divert construction and demolition waste from landfills and incinerators, and facilitate their salvage and recycle not limited to the following:

1. Waste Management Plan development and implementation.
2. Techniques to minimize waste generation.
3. Sorting and separating of waste materials.
4. Salvage of existing materials and items for reuse or resale.
5. Recycling of materials that cannot be reused or sold.

D. At a minimum the following waste categories shall be diverted from landfills:

1. Soil.
2. Inerts (eg, concrete, masonry and asphalt).
3. Clean dimensional wood and palette wood.
4. Green waste (biodegradable landscaping materials).
5. Engineered wood products (plywood, particle board and I-joists, etc).
6. Metal products (eg, steel, wire, beverage containers, etc).
7. Cardboard, paper and packaging.
8. Bitumen roofing materials.
9. Plastics (eg, ABS, PVC).
10. Carpet and/or pad.
11. Gypsum board.
12. Insulation.
13. Paint.

1.2 RELATED WORK

A. Section 02 50 00, MINOR DEMOLITION FOR RENOVATION.

B. Section 01 00 00, GENERAL REQUIREMENTS.

C. Lead Paint: Section 02 83 33.13, LEAD BASED PAINT REMOVAL AND DISPOSAL.

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 reuse and recycle new materials to a minimum of 50 percent.

D. Contractor shall be responsible for implementation of any special programs involving rebates or similar incentives related to recycling. Any revenues or savings obtained from salvage or recycling shall accrue to the contractor.

E. Contractor shall provide all demolition, removal and legal disposal of materials. Contractor shall ensure that facilities used for recycling, reuse and disposal shall be permitted for the intended use to the extent required by local, state, federal regulations. The Whole Building Design Guide website http://www.wbdg.org provides a Construction Waste Management Database that contains information on companies that haul. Collect, and process recyclable debris from construction projects.

F. Contractor shall assign a specific area to facilitate separation of materials for reuse, salvage, recycling, and return. Such areas are to be kept neat and clean and clearly marked in order to avoid contamination or mixing of materials.

G. Contractor shall provide on-site instructions and supervision of separation, handling, salvaging, recycling, reuse and return methods to be used by all parties during waste generating stages.

H. Record on daily reports any problems in complying with laws, regulations and ordinances with corrective action taken.

1.4 TERMINOLOGY

A. Class III Landfill: A landfill that accepts non-hazardous resources such as household, commercial and industrial waste resulting from construction, remodeling, repair and demolition operations.

B. Clean: Untreated and unpainted; uncontaminated with adhesives, oils, solvents, mastics and like products.

C. Construction and Demolition Waste: Includes all non-hazardous resources resulting from construction, remodeling, alterations, repair and demolition operations.

D. Dismantle: The process of parting out a building in such a way as to preserve the usefulness of its materials and components.

E. Disposal: Acceptance of solid wastes at a legally operating facility for the purpose of land filling (includes Class III landfills and inert fills).

F. Inert Backfill Site: A location, other than inert fill or other disposal facility, to which inert materials are taken for the purpose of filling an excavation, shoring or other soil engineering operation.

G. Inert Fill: A facility that can legally accept inert waste, such as asphalt and concrete exclusively for the purpose of disposal.

H. Inert Solids/Inert Waste: Non-liquid solid resources including, but not limited to, soil and concrete that does not contain hazardous waste or soluble pollutants at concentrations in excess of water-quality objectives established by a regional water board, and does not contain significant quantities of decomposable solid resources.

I. Mixed Debris: Loads that include commingled recyclable and non-recyclable materials generated at the construction site.

J. Mixed Debris Recycling Facility: A solid resource processing facility that accepts loads of mixed construction and demolition debris for the purpose of recovering re-usable and recyclable materials and disposing non-recyclable materials.

K. Permitted Waste Hauler: A company that holds a valid permit to collect and transport solid wastes from individuals or businesses for the purpose of recycling or disposal.

L. Recycling: The process of sorting, cleansing, treating, and reconstituting materials for the purpose of using the altered form in the manufacture of a new product. Recycling does not include burning, incinerating or thermally destroying solid waste.
   1. On-site Recycling – Materials that are sorted and processed on site for use in an altered state in the work, i.e. concrete crushed for use as a sub-base in paving.
   2. Off-site Recycling – Materials hauled to a location and used in an altered form in the manufacture of new products.

M. Recycling Facility: An operation that can legally accept materials for the purpose of processing the materials into an altered form for the manufacture of new products. Depending on the types of materials accepted and operating procedures, a recycling facility may or may not be required to have a solid waste facilities permit or be regulated by the local enforcement agency.

N. Reuse: Materials that are recovered for use in the same form, on-site or off-site.

O. Return: To give back reusable items or unused products to vendors for credit.

P. Salvage: To remove waste materials from the site for resale or re-use by a third party.

Q. Source-Separated Materials: Materials that are sorted by type at the site for the purpose of reuse and recycling.

R. Solid Waste: Materials that have been designated as non-recyclable and are discarded for the purposes of disposal.

S. Transfer Station: A facility that can legally accept solid waste for the purpose of temporarily storing the materials for re-loading onto other trucks and transporting them to a landfill for disposal, or recovering some materials for re-use or recycling.

1.5 SUBMITTALS

A. In accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, and SAMPLES, furnish the following:

B. Prepare and submit to the Resident Engineer a written demolition debris management plan. The plan shall include, but not be limited to, the following information:
   1. Procedures to be used for debris management.
   2. Techniques to be used to minimize waste generation.
   3. Analysis of the estimated job site waste to be generated:

a. List of each material and quantity to be salvaged, reused, recycled.
b. List of each material and quantity proposed to be taken to a landfill.

4. Detailed description of the Means/Methods to be used for material handling.
   a. On site: Material separation, storage, protection where applicable.
   b. Off site: Transportation means and destination. Include list of materials.
      1) Description of materials to be site-separated and self-hauled to designated facilities.
      2) Description of mixed materials to be collected by designated waste haulers and removed from the site.
   c. The names and locations of mixed debris reuse and recycling facilities or sites.
   d. The names and locations of trash disposal landfill facilities or sites.
   e. Documentation that the facilities or sites are approved to receive the materials.

B. Designated Manager responsible for instructing personnel, supervising, documenting and administer over meetings relevant to the Waste Management Plan.

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

1.6 APPLICABLE PUBLICATIONS

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.

A. U.S. Green Building Council (USGBC):
LEED Green Building Rating System for New Construction

PART 2 – PRODUCTS NOT USED

PART 3 - EXECUTION

3.1 COLLECTION

A. Provide all necessary containers, bins and storage areas to facilitate effective waste management.

B. Clearly identify containers, bins and storage areas so that recyclable materials are separated from trash and can be transported to respective recycling facility for processing.

C. Hazardous wastes shall be separated, stored, disposed of according to local, state, federal regulations.

3.2 DISPOSAL

A. Contractor shall be responsible for transporting and disposing of materials that cannot be delivered to a source-separated or mixed materials recycling facility to a transfer station or disposal facility that can accept the materials in accordance with state and federal regulations.

B. Construction or demolition materials with no practical reuse or that cannot be salvaged or recycled shall be disposed of at a landfill or incinerator.

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SECTION 02 05 00
MINOR DEMOLITION FOR RENOVATION

PART 1 - GENERAL

1.1 DESCRIPTION

This section specifies minor demolition of existing materials required to complete the renovation work including but not limited to removal and disposal of metal roofing, sheet metal coverings over historic wood window trim, freize boards, fascias/gutters, porch windows and associated walls, brick columns, and selected doors and windows of the Meigs Lodge Building at Lebanon National Cemetery.

1.2 RELATED WORK

A. Disconnecting utility services prior to demolition: Section 01 00 00, GENERAL REQUIREMENTS.

B. Reserved items that are to remain the property of the Government: Section 01 00 00, GENERAL REQUIREMENTS.

C. Lead Paint: Section 02 83 33.13, LEAD-BASED PAINT REMOVAL AND DISPOSAL.

D. Environmental Protection: Section 01 57 19, TEMPORARY ENVIRONMENTAL CONTROLS.

E. Waste Management: Section 01 74 19, CONSTRUCTION WASTE MANAGEMENT

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, 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 1.9 PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES AND IMPROVEMENTS.

C. Maintain fences, barricades and other similar items around exposed excavations until such excavations have been completely filled.

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 4500 mm (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 Cemetery Property; any damaged items shall be repaired or replaced as approved by the Resident Engineer. 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 Resident Engineer’s approval.

H. The work shall comply with the requirements of Section 01 57 19, TEMPORARY ENVIRONMENTAL CONTROLS.

PART 2 - PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 SITE CLEARING

A. General: Remove trees, shrubs, grass, and other vegetation, pavements, improvements, or obstructions, as required, to permit installation of new construction. Remove similar items elsewhere on site or premises as specifically indicated. Removal includes digging out and off-site disposal of stumps and roots.

1. Cut minor roots and branches of trees indicated to remain in a clean and careful manner where such roots and branches obstruct installation of new construction.

B. Erosion Control: Contractor shall provide erosion control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

Contractor shall install silt fence and inlet protection as shown and as per requirements of the SWPPP, prior to any soil disturbance activities. Provide temporary seeding as required by the SWPPP.

C. Maintain site controls in accordance with Storm Water Pollution Prevention Plan and repair as directed by COTR to sustain compliance with SPDES permit. Maintain all records as required by the SWPPP. Perform inspections as required by the SWPPP.

D. Topsoil - On-site: Topsoil is defined as friable clay loam surface soil found in a depth of not less than 6 inches. Satisfactory topsoil is reasonably free and/or screened of subsoil, clay lumps, stones, and other objects over 1 inch in diameter, and without weeds, roots, and other objectionable material.
   1. Strip topsoil to whatever depths encountered in a manner to prevent intermingling with underlying subsoil or other objectionable material. Remove heavy growths of grass from areas before stripping.
      a. Where existing trees are indicated to remain, leave existing topsoil in place within drip lines to prevent damage to root system.
   2. Stockpile topsoil in storage piles in areas indicated or directed. Construct storage piles to provide free drainage of surface water. Cover storage piles to prevent wind erosion in accordance with the Storm Water Pollution Prevention Plan. Refer to Division 2 Section 02900, “Landscape Work” for soil amendments required prior to spreading topsoil.
      a. Stockpile shall be contained with erosion and sediment controls (silt fence) and stabilized if undisturbed in accordance with the Storm Water Pollution Prevention Plan.
   3. Dispose of unsuitable or excess topsoil as specified for disposal of waste material only after approval of the Architect.

E. Clearing and Grubbing: Clear site of trees, shrubs, and other vegetation, except for those indicated to be left standing.
   1. Completely remove stumps, roots, and other debris protruding through ground surface.
   2. Use only hand methods for grubbing inside drip line of trees indicated to remain.
   3. Fill depressions caused by clearing and grubbing operations with satisfactory soil material, unless further excavation or earthwork is indicated.
      a. Place fill material in horizontal layers not exceeding 6 inches loose depth, and thoroughly compact each layer to a density equal to adjacent original ground.

F. Removal of Improvements: Remove existing above-grade and below-grade improvements as indicated and as necessary to facilitate new construction.

G. Abandonment or removal of certain underground pipe or conduits may be indicated on mechanical or electrical drawings and is included under work of related Division 23 and 26 Sections. Removing abandoned underground piping or conduits interfering with construction is included under this Section, except as indicated to be abandoned in-place.

H. Continue maintenance of erosion controls in compliance with the Storm Water Pollution Prevention Plan until the work is completed and the threat of erosion is gone by either around surface stabilizer or lawn “grow-in” is at 85% complete. Temporary erosion control devices shall not be removed until the area is certified as being stabilized by the Qualified Inspector.

3.2 DEMOLITION

A. Completely demolish and remove buildings and structures as indicated on the drawings.

B. Debris, including brick, concrete, stone, metals and similar materials shall become property of Contractor and shall be disposed of by him daily, off the Cemetery Property to avoid accumulation at the demolition site. Materials that cannot be removed daily shall be stored in areas specified by the Resident Engineer.

C. Remove and legally dispose of all materials generated from work of this project not scheduled for reuse. 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. **Burning is not permitted on the property.**

3.2 CLEAN-UP

On completion of work of this section and after removal of all debris, leave site in clean condition satisfactory to Resident Engineer. Clean-up shall include off the Cemetery Property 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 82 13.13
GLOVEBAG ASBESTOS ABATEMENT

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INSTRUCTIONS TO ARCHITECT/ENGINEER AND INDUSTRIAL HYGIENE CONSULTANT SECTION 02 82 13.13 - GLOVEBAG ASBESTOS ABATEMENT

PART 1 - GENERAL

1.1 SUMMARY OF THE WORK

1.1.1 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 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 (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 Contractor. All cost incurred due to such action are also the responsibility of the Contractor.

1.1.2 EXTENT OF WORK

A. 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 himself as 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.

B. Removal, clean-up and disposal of ACM piping and fittings and asbestos contaminated elements in an appropriate regulated area in the following approximate quantities;
(40) linear feet of 2" - 6" diameter pipe insulation (crawlspace)

C. Removal, clean-up and disposal of other ACM in an appropriate regulated area in the following approximate quantities;
(1,000) square feet of exterior transite siding (2nd floor)
(285) square feet of lower roof coating
(30) square feet of lower roof flashing
(210) square feet of linoleum (Kitchen)

(20) square feet of linoleum (1st floor Bathroom)

1.1.3 RELATED WORK

B. Section 02 05 00; MINOR DEMOLITION FOR RENOVATION.

C. Division 09; FINISHES.

1.1.4 TASKS

The work tasks are summarized briefly as follows:

A. Pre-abatement activities including pre-abatement meeting(s), inspection(s), notifications, permits, submittal approvals, work-site preparations, emergency procedures arrangements, and standard operating procedures for glovebag and non-friable 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.

1.1.5 ABATEMENT CONTRACTOR USE OF PREMISES

A. 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.

B. The Contractor shall use the existing facilities in the building strictly within the limits indicated in contract documents as well as the approved pre-abatement work plan. Asbestos abatement 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.

1.2 VARIATIONS IN QUANTITY

The quantities and locations of ACM as indicated on the drawings and the extent of work included in this section are estimates which are limited by the physical constraints imposed by occupancy of the buildings. Accordingly, minor variations (+/- 5%) 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

additional footage for newly discovered materials and those prices will be used for additional work under the contract.

1.3 STOP ASBESTOS REMOVAL

If the Contracting Officer or their field representative presents a written **Stop Asbestos Removal Order**, the Abatement Contractor/Personnel shall immediately stop all asbestos removal and adequately wet any exposed ACM. The Contractor shall not resume any asbestos removal activity until authorized to do so by the VA. A stop asbestos removal order may be issued at any time the VA determines abatement conditions/activities are not within specification requirements. 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 industrial hygienist's time. The occurrence of any of the following events shall be reported immediately by the Contractor in writing to the VA representative and shall require the Contractor to immediately stop asbestos removal activities and initiate fiber reduction activities:

A. =/> 0.01 f/cc outside a regulated area or >0.05 f/cc inside a regulated area;
B. breach/break in regulated area critical barrier(s)/floor;
C. serious injury/death at the site;
D. fire/safety emergency at the site;
E. respiratory protection system failure;
F. power failure or loss of wetting agent; or
G. any visible emissions observed outside the regulated area.

1.4 DEFINITIONS

1.4.1 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.

1.4.2 GLOSSARY

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

ACE - Asbestos contaminated elements.

ACM - Asbestos containing material.

Aerosol - Solid or liquid particulate suspended in air.

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.

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

Aggressive 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 2 is used to determine the fiber levels in air.

Air sample filter - The filter used to collect fibers which are then counted. The filter is made of mixed cellulose ester membrane for PCM (Phase Contrast Microscopy) and polycarbonate for TEM (Transmission Electron Microscopy)

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

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

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

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 having jurisdiction over the regulated area.

Barrier - Any surface the 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 plastic sheeting secured in place at openings such as doors, windows, or any other opening into the regulated area.

Primary Barrier - Barriers placed over critical barriers and exposed directly to abatement work.

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

Breathing zone - The hemisphere forward of the shoulders with a radius of about 150 - 225 mm (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) - One certified in practice of industrial hygiene by the American Board of Industrial Hygiene. An industrial hygienist Certified in Comprehensive Practice 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 industrial hygiene consultant (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) - The Contractor's industrial hygienist. The industrial hygienist must meet the qualification requirements of the PIH.

Count - Refers to the fiber count or the average number of fibers greater than five microns in length per cubic centimeter of air.

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 siftproof, dustproof, leaktight 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 - Activities 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 siftproof, dustproof, and leaktight.

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 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 1 percent asbestos as determined using the method specified in appendix A, Subpart F, 40 CFR 763, section 1, 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 - A filter capable of trapping and retaining at least 99.97 percent of all mono-dispersed particles of 0.3 microns or greater 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 - 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 - 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.

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's) - EPA's rule to control emissions of asbestos to the environment.

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's.

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" water 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 outside the respirator.

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 for organic vapor exposures.

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.

Personal sampling/monitoring - Representative air samples obtained in the breathing zone of the person using a cassette and battery operated pump to determine asbestos exposure.

Permissible exposure limit (PEL) - The level of exposure OSHA allows for an 8 hour time weighted average. For asbestos fibers, the PEL is 0.1 fibers per cc.

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

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

Positive/negative fit check - A method of verifying the fit of a respirator by closing off the filters and breathing in or closing off the exhalation valve and breathing out while detecting leakage of the respirator.

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.

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

Protection factor - A value assigned by OSHA/NIOSH to indicate the assigned protection a respirator should provide if worn properly. The number indicates the reduction of exposure level from outside to inside the respirator.

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 nonfriable ACM that has become friable; Category I nonfriable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading or; Category II nonfriable 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. Also used for bag/drum decontamination in the EDF.

Standard operating procedures (SOP's) - Asbestos work procedures required to be submitted by the contractor before work begins.

Supplied air respirator (SAR) - A respirator that utilizes an air supply separate from the air in the regulated area.

Surfacing ACM - A material containing more than 1 percent asbestos that is sprayed, troweled on or otherwise applied to surfaces for acoustical, 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 Industrial Hygienist (VPIH/CIH) - Department of Veterans Affairs Professional Industrial Hygienist.

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

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

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

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

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.

1.4.3 REFERENCED STANDARDS ORGANIZATIONS

The following acronyms or abbreviations as referenced in contract/ specification documents are defined to mean the associated names. Names and addresses may be subject to change.

A. VA Department of Veterans Affairs
810 Vermont Avenue, NW
Washington, DC 20420

B. AIHA American Industrial Hygiene Association
2700 Prosperity Avenue, Suite 250
Fairfax, VA 22031
703-849-8888

C. ANSI American National Standards Institute
1430 Broadway
New York, NY 10018
212-354-3300

D. ASTM American Society for Testing and Materials
1916 Race St.
Philadelphia, PA 19103
215-299-5400

E. CFR Code of Federal Regulations
Government Printing Office
Washington, DC 20420

F. CGA Compressed Gas Association
1235 Jefferson Davis Highway

Arlington, VA 22202
703-979-0900

G. CS Commercial Standard of the National Institute of Standards and Technology(NIST)
U. S. Department of Commerce
Government Printing Office
Washington, DC 20420

H. EPA Environmental Protection Agency
401 M St., SW
Washington, DC 20460
202-382-3949

I. MIL-STD Military Standards/Standardization Division
Office of the Assistant Secretary of Defense
Washington, DC 20420

J. MSHA Mine Safety and Health Administration
Respiratory Protection Division
Ballston Tower #3
Department of Labor
Arlington, VA 22203
703-235-1452

K. NIST National Institute for Standards and Technology
U. S. Department of Commerce
Gaithersburg, MD 20234
301-921-1000

L. NEC National Electrical Code (by NFPA)

M. NEMA National Electrical Manufacturer's Association
2101 L Street, NW
Washington, DC 20037

N. NFPA National Fire Protection Association
1 Batterymarch Park
P.O. Box 9101
Quincy, MA 02269-9101
800-344-3555

O. NIOSH National Institutes for Occupational Safety and Health
4676 Columbia Parkway
Cincinnati, OH 45226
513-533-8236

P. OSHA Occupational Safety and Health Administration
U.S. Department of Labor
Government Printing Office
Washington, DC 20402

Q. UL Underwriters Laboratory
333 Pfingsten Rd.
Northbrook, IL 60062
312-272-8800

R. USA United States Army
Army Chemical Corps
Department of Defense
Washington, DC 20420

1.5 APPLICABLE CODES AND REGULATIONS

1.5.1 GENERAL APPLICABILITY OF CODES, REGULATIONS, AND STANDARDS

A. 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.

B. The most recent edition of any relevant regulation, standard, document or code shall be in effect. Where conflict among the requirements or with these specification exists, the most stringent requirement(s) shall be utilized.

C. 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.

1.5.2 CONTRACTOR RESPONSIBILITY

The 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 abatement project. The contractor is responsible for providing and maintaining training, accreditation, medical exams, medical records, personal protective equipment as required by applicable Federal, State and Local regulations. The contractor shall hold the VA and VPIH/CIH consultants harmless for any 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, including all sampling/analytical costs to assure compliance with OSHA/EPA/State requirements.

1.5.3 FEDERAL REQUIREMENTS

Federal requirements which govern some aspect of 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 1910.132 - Personal Protective Equipment
   3. Title 29 CFR 1910.134 - Respiratory Protection
   4. Title 29 CFR 1926 - Construction Industry Standards
   5. Title 29 CFR 1910.20 - Access to Employee Exposure and Medical Records
   6. Title 29 CFR 1910.1200 - Hazard Communication
   7. Title 29 CFR 1910.151 - Medical and First Aid
B. Environmental Protection Agency **(EPA)**
   1. 40 CFR 61 Subpart A and M (Revised Subpart B) - National Emission Standard for Hazardous Air Pollutants - Asbestos.
   2. 40 CFR 763.80 - Asbestos Hazard Emergency Response Act (AHERA)
C. Department of Transportation **(DOT)**
   Title 49 CFR 100 - 185 - Transportation

1.5.4 STATE REQUIREMENTS:

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

A. Environmental Protection Agency **(EPA)**
   1. Kentucky Natural Resources and Environmental Protection Cabinet, Division for Air Quality 401 KAR 58:005 (accreditation of asbestos professionals), 401 KAR 58:025 (asbestos NESHAPS standards), 401 KAR 58:010 (AHERA requirements for schools), and 401 KAR 58:040 (certification and work-practice requirements for abatement entities)
   2. Kentucky Natural Resources and Environmental Protection, Division of Waste Management, Recommended Procedures for Treatment and Disposal of Asbestos Waste.
B. Occupational Safety and Health Administration **(OSHA)**
   1. Kentucky Division of Occupational Safety & Health Revisions to Adopted 29 CFR Part 1926.1101, Asbestos, Tremolite, Anthophyllite, and Actinolite. Also revisions to Amended 29 CFR Part 1910.1001, Occupational Exposure to Asbestos, Tremolite, Anthophyllite, and Actinolite.

1.5.5 LOCAL REQUIREMENTS

If local requirements are more stringent than federal or state standards, the local standards are to be followed.

1.5.6 STANDARDS

A. Standards which govern asbestos abatement activities include, but are not limited to, the following:

1. American National Standards Institute (ANSI)Z9.2-79 - Fundamentals Governing the Design and Operation of Local Exhaust Systems Z88.2 - Practices for Respiratory Protection.
2. Underwriters Laboratories (UL)586-90 - UL Standard for Safety of HEPA filter Units, 7th Edition.

B. Standards which govern encapsulation work include, but are not limited to, the following:
1. American Society for Testing and Materials (ASTM)

C. Standards which govern the fire and safety concerns in abatement work include, but are not limited to, the following:
1. National Fire Protection Association (NFPA) 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations.
2. NFPA 701 - Standard Methods for Fire Tests for Flame Resistant Textiles and Film.
3. NFPA 101 - Life Safety Code

1.5.7 EPA GUIDANCE DOCUMENTS

A. EPA guidance documents which discuss asbestos abatement work activities are listed below. These documents are made part of this section by reference. EPA publications can be ordered from (800) 424-9065.

B. Guidance for Controlling ACM in Buildings (Purple Book) EPA 560/5-85-024

C. Asbestos Waste Management Guidance EPA 530-SW-85-007.

D. A Guide to Respiratory Protection for the Asbestos Abatement Industry EPA-560-OPTS-86-001

E. Guide to Managing Asbestos in Place (Green Book) TS 799 20T July 1990

1.5.8 NOTICES

A. State and Local agencies: Send written notification as required by state and local regulations including the local fire department prior to beginning any work on ACM as follows:

B. Copies of notifications shall be submitted to the VA for the facility's records in the same time frame notification is given to EPA, State, and Local authorities.

1.5.9 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.

1.5.10 POSTING AND FILING OF REGULATIONS

Maintain two (2) copies of applicable federal, state, and local regulations. Post one copy of each at the regulated area where workers will have daily access to the regulations and keep another copy in the Contractor's office.

1.5.11 VA RESPONSIBILITIES

Prior to commencement of work:

A. 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.**

B. Submit to the Contractor results of background air sampling; including location of samples, person who collected the samples, equipment utilized and method of analysis.

C. 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.

1.5.12 SITE SECURITY

A. 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.

B. 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 notify the VA.

C. 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.

D. Access to the regulated area shall be through a single decontamination unit, if required. All other access (doors, windows, hallways, etc.) shall be sealed or locked to prevent entry to or exit from the regulated area. 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 <u>not</u> be locked from the inside, however, they shall be sealed with poly sheeting and taped until needed.

E. 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.

F. The Abatement 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.

G. The regulated area shall be locked during non-working hours and secured by VA security guards.

1.5.13 EMERGENCY ACTION PLAN AND ARRANGEMENTS

A. An Emergency Action Plan shall be developed by the Contractor 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 1910.38 (a);(b).

B. Emergency procedures shall be in written form and prominently posted and available in the regulated area. 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.

C. Emergency planning shall include written notification of police, fire, and emergency medical personnel of planned abatement activities; work schedule and layout of regulated area, particularly barriers that may affect response capabilities.

D. 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.

E. Employees shall be trained in regulated area/site evacuation procedures in the event of workplace emergencies.

1. For non life-threatening situations - employees injured or otherwise incapacitated shall decontaminate following normal procedures with assistance from fellow workers, if necessary, before exiting the regulated area to obtain proper medical treatment.
2. For life-threatening injury or illness, worker decontamination shall take least priority after measures to stabilize the injured worker, remove them from the regulated area, and secure proper medical treatment.

F. Telephone numbers of all emergency response personnel shall be prominently posted in the clean room, along with the location of the nearest telephone.

G. The Contractor shall provide verification of first aid/CPR training for personnel responsible for providing first aid/CPR. OSHA requires medical assistance within 3 minutes of a life-threatening injury/illness. Bloodborne Pathogen training shall also be verified for those personnel required to provide first aid/CPR.

H. 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; and power failure. The Contractor shall detail procedures to be followed in the event of an incident assuring that work is stopped and wetting is continued until correction of the problem.

1.5.14 PRE-CONSTRUCTION MEETING

Prior to commencing the work, the Contractor shall meet with the VPCIH 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 is trained and accredited and approved for working in this State. Verification of the experience of the Competent Person 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 Standard Operating Procedures for Class I Glovebag Asbestos Abatement. 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);
3. If required, decontamination area set-up/layout and decontamination procedures for employees;
4. Glovebag 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

The following are the minimum administrative and supervisory personnel necessary for coordination of the work.

1.6.1 PERSONNEL

A. Administrative and supervisory personnel shall consist of a qualified Competent Person 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; social security number; qualifications; accreditation card with picture; 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 asbestos regulations in the past three (3) years; has adequate liability/occurrence insurance for asbestos work; is licensed in applicable states; 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; 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 (CPIH) 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 developed at least one complete standard operating procedure for asbestos abatement; has trained abatement personnel for three (3) years; has specialized EPA AHERA/OSHA training in asbestos abatement management, respiratory protection, waste disposal and asbestos inspection; has completed the NIOSH 582 Course, 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; has applicable medical and respiratory protection documentation; has certificate of training/current refresher and State accreditation/license.

1.7 RESPIRATORY PROTECTION

1.7.1 GENERAL - RESPIRATORY PROTECTION PROGRAM

The Contractor shall develop and implement a Respiratory Protection Program (RPP) which is in compliance with the January 8, 1998 OSHA requirements found at 29 CFR 1926.1101 and 29 CFR 1910.132;134. ANSI Standard Z88.2-1992 provides excellent guidance for developing a respiratory protection program All respirators used must be NIOSH approved for asbestos abatement activities. The written respiratory protection shall, at a minimum, contain the basic requirements found at 29 CFR 1910.134 (c)(1)(i - ix) - Respiratory Protection Program.

1.7.2 RESPIRATORY PROTECTION PROGRAM COORDINATOR

The Respiratory Protection Program Coordinator (RPPC) must be identified and shall have two (2) years experience coordinating the program. The RPPC must provide a signed statement attesting to the fact that the program meets the above requirements.

1.7.3 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 qualification. 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 for reference by employees or authorized visitors.

1.7.4 MINIMUM RESPIRATORY PROTECTION

Minimum respiratory protection shall be a full face powered air purifying respirator when fiber levels are maintained consistently at or below 0.5 f/cc. A higher level of respiratory protection may be provided or required, depending on fiber levels. Respirator selection shall meet the requirements of 29 CFR 1926.1101 (h); Table 1, except as indicated in this paragraph. Abatement personnel must have a respirator for their exclusive use.

1.7.5 MEDICAL WRITTEN OPINION

No employee shall be allowed to wear a respirator unless a physician has determined they are capable of doing so and has issued a written opinion for that person.

1.7.6 RESPIRATOR FIT TEST

All personnel wearing respirators shall have a current quantitative fit test which was conducted in accordance with 29 CFR 1910.134 (f) and Appendix A. Fit tests shall be done for PAPR's which have been put into a failure mode.

1.7.7 RESPIRATOR FIT CHECK

The Competent Person shall assure that the positive/negative fit check is done each time the respirator is donned by an employee. Headcoverings must cover respirator headstraps. Any situation that prevents an effective facepiece to face seal as evidenced by failure of a fit check shall preclude that person from wearing a respirator until resolution of the problem.

1.7.8 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.

1.8 WORKER PROTECTION

1.8.1 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.

1.8.2 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. The physician's written opinion as required by 29 CFR 1926.1101 (m)(4) shall be provided for each person and shall include in the opinion the person has been evaluated for working in a heat stress environment while wearing personal protective equipment and is able to perform the work.

1.8.3 PERSONAL PROTECTIVE EQUIPMENT

Provide whole body clothing, head coverings, 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.

1.8.4 REGULATED AREA ENTRY PROCEDURE

Worker protection shall meet the most stringent requirement. 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.

1.8.5 DECONTAMINATION PROCEDURE – PAPR

The Competent Person shall require all personnel to adhere to following decontamination procedures whenever they leave the regulated area.

A. When exiting the regulated area, remove disposable coveralls, and ALL other clothes, disposable head coverings, and foot coverings or boots in the equipment room.

B. 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 asbestos fibers wile showering. The following procedure is required as a minimum:

   1. Thoroughly wet body including hair and face. If using a PAPR hold blower above head to keep filters dry.
   2. 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.

3. 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.

C. 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!**

D. Shower and wash body completely with soap and water. Rinse thoroughly.

E. Rinse shower room walls and floor to drain prior to exiting.

F. Proceed from shower to clean room; dry off and change into street clothes or into new disposable work clothing.

1.8.6 REGULATED AREA REQUIREMENTS

The Competent Person shall meet all requirements of 29 CFR 1926.1101 (o) and assure that all requirements for Class I glovebag 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

1.9.1 DESCRIPTION

Provide each regulated area with separate personnel (PDF) and waste/equipment decontamination facilities (W/EDF). Ensure that the PDF is 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.

1.9.2 GENERAL REQUIREMENTS

All personnel entering or exiting a regulated area shall follow the requirements at 29 CFR 1926.1101 (j)(1) and these specifications. All equipment and 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. Weigh sheets with layers of duct tape 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.

1.9.3 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 electric power with ground fault protection and overhead wiring in the PDF and W/EDF. Provide a sub-panel 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 to maintain 70°F throughout the PDF and W/EDF..

1.9.4 PERSONNEL DECONTAMINATION FACILITY (PDF)

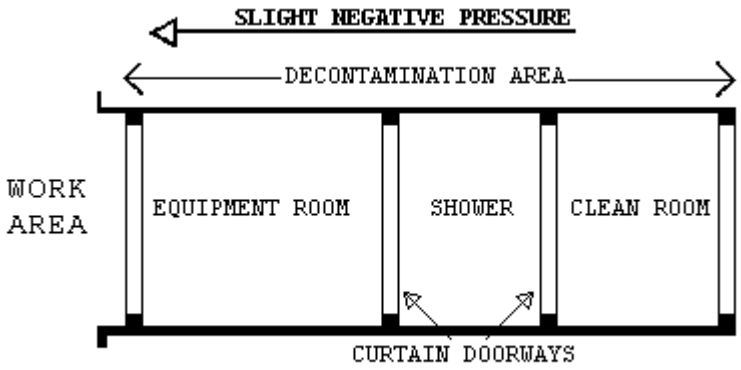
The Competent Person shall provide a PDF consisting of shower room which is contiguous to a clean room and equipment room. The PDF must be sized to accommodate the number of personnel scheduled for the project. The shower room, located in the center of the PDF, shall be fitted with as many portable showers 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 2 layers of 6 mil fire retardant poly to provide an air tight room. Provide a minimum of 2 - 900 mm (3 foot) wide flapped 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 condition. Shower overflow shall not be allowed into the clean room. An adequate supply of disposable towels shall be provided. Provide storage lockers per person. A portable fire extinguisher, 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. 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 can enter or exit the PDF during 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 regulated area 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 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, reusable footwear and for use as a change station for personnel exiting the regulated area. The equipment room shall be separated from the regulated area by a minimum 3 foot wide door made of 2 layers of 6 mil 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 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. Provide a temporary electrical sub-panel equipped with GFCI in this room to accommodate any equipment required in the regulated area.
4. The PDF shall consist of the following: 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 is minimum of 2 layers of 6 mil fire retardant poly.



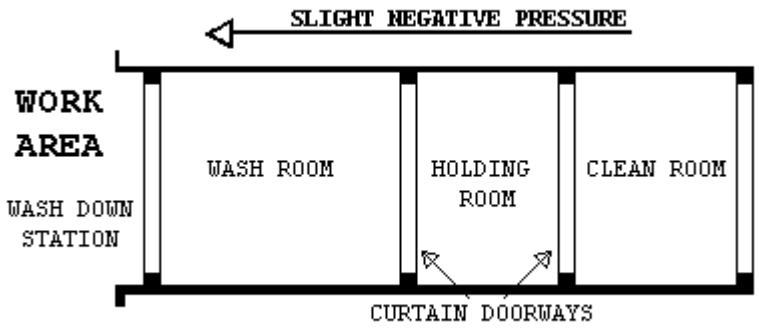
1.9.5 WASTE/EQUIPMENT DECONTAMINATION FACILITY (W/EDF)

The Competent Person shall provide a W/EDF consisting of a wash room, holding room, and clean room for removal of all 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:

1. 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.
2. 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 50 x 100 mm (2" x 4") wood framing 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.
3. Holding Room: Provide a holding room as a drop location for bagged materials passed from the wash room. Construct the holding room using 50 x 100 mm (2" x 4") wood framing 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.
4. Clean Room: Provide a clean room to isolate the holding room from the building exterior. Construct the clean room using 2 x 4 wood framing

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 two layers of 6 mil fire retardant poly.

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



1.9.6 WASTE/EQUIPMENT DECONTAMINATION PROCEDURES

At 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. These personnel will not be required to wear PPE. At no time shall personnel from the clean side be allowed to enter the Wash Room.

PART 2 - PRODUCTS, MATERIALS AND EQUIPMENT

2.1 MATERIALS AND EQUIPMENT

2.1.1 GENERAL REQUIREMENTS (ALL ABATEMENT PROJECTS)

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 has submitted verification to the VA's representative to this effect:

A. All materials shall be delivered in their original package, container or bundle bearing the name of the manufacturer and the brand name (where applicable).
B. 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 materials cannot be stored inside buildings. Replacement materials shall be stored outside of the regulated/work area until abatement is completed.
C. 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 place.
D. 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.
E. Poly sheeting put under the glovebag regulated area shall be a minimum of 6 mils in thickness.
F. If required, 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.
G. Polyethylene sheeting utilized for personnel decontamination facility shall be opaque white or black in color, 6 mil fire retardant poly.
H. Installation and plumbing hardware, showers, hoses, drain pans, sump pumps and waste water filtration system shall be provided by the Contractor.
I. 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 shall be provided. 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 shall also be provided. All electrically operated hand tools, equipment, electric cords shall be equipped with GFCI protection.
J. 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).
K. Disposal bags – 2 layers of 6 mil, for asbestos waste shall be pre-printed with labels, markings and address as required by OSHA, EPA and DOT regulations.

L. The VA shall be provided a copy of the MSDS as required for all hazardous chemicals under OSHA 29 CFR 1910.1200 - Hazard Communication. Chlorinated compounds shall not be used with any spray adhesive or other product. Appropriate encapsulant(s) shall be provided.

M. 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.

N. 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 hazard assessment conducted under 29 CFR 1910.132(d).

2.2 CONTAINMENT BARRIERS AND COVERINGS IN THE REGULATED AREA

2.2.1 GENERAL

Using critical barriers, seal off the perimeter to the regulated area to completely isolate the regulated area from adjacent spaces. All horizontal surfaces in the regulated area must be covered with 2 layers of 6 mil fire retardant poly to prevent contamination and to facilitate clean-up. Should adjacent areas become contaminated, immediately stop work and clean up the contamination at no additional cost to the Government. Provide firestopping and identify all fire barrier penetrations due to abatement work as specified in Section 2.2.8; FIRESTOPPING.

2.2.2 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. Remove all uncontaminated removable furniture, equipment and/or supplies from the regulated area before commencing work, or completely cover with 2 layers of 6-mil fire retardant poly sheeting and secure with duct tape. Lock out and tag out any HVAC systems in the regulated area.

2.2.3 CONTROLLING ACCESS TO THE REGULATED AREA

Access to the regulated area is allowed only through the personnel decontamination facility (PDF), if required. 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 sheeting to prevent building occupant observation. If the adjacent area is accessible to the public, the barrier must be solid.

2.2.4 CRITICAL BARRIERS

Completely separate any openings into the regulated area from adjacent areas using fire retardant poly at least 6 mils thick 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 in the regulated area. Heat must be shut off any objects covered with poly.

2.2.5 SECONDARY BARRIERS

A loose layer of 6 mil fire retardant poly shall be used as a drop cloth to protect the floor/horizontal surfaces from debris generated during the glovebag abatement. This layer shall be replaced as needed during the work.

2.2.6 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. If the affected area cannot be added to the regulated area, decontamination measures must be started immediately and continue until air monitoring indicates background levels are met.

2.2.7 FIRESTOPPING

A. Through penetrations caused by cables, cable trays, pipes, sleeves 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.

2.3 MONITORING, INSPECTION AND TESTING

2.3.1 GENERAL

A. Perform throughout abatement work monitoring, inspection and testing inside and around the regulated area in accordance with the OSHA

requirements and these specifications. The CPIH shall periodically 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 shall personally manage air sample collection, analysis, and evaluation for personnel, regulated area, and adjacent area samples to satisfy OSHA requirements. Additional inspection and testing requirements are also indicated in other parts of this specification.

B. 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.

C. 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 with review and approval of the VPIH/CIH. An agreement between the CPIH 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.

2.3.2 SCOPE OF SERVICES OF THE VPIH/CIH CONSULTANT

A. The purpose of the work of the VPIH/CIH is to: Assure quality; resolve problems; and prevent the spread of contamination beyond the regulated area. 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/may perform the following tasks:

1. Task 1: Establish background levels before abatement begins by collecting background samples. Retain samples for possible TEM analysis.
2. Task 2: Perform continuous 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.
3. 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.
4. Task 4: Provide support to the VA representative such as evaluation of submittals from the Contractor, resolution of unforeseen developments, etc.
5. Task 5: Perform, in the presence of the VA representative, final inspection and testing of a decontaminated regulated area or building at the conclusion of the abatement and clean-up work to certify compliance with all regulations and the VA requirements/specifications.
6. Task 6: Issue certificate of decontamination for each regulated area or building and project report.

B. All data, 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.

C. 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.

2.3.3 MONITORING, INSPECTION AND TESTING BY ABATEMENT CONTRACTOR CPIH

The CPIH 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 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 air sampling and analysis. The IH Technician shall have a NIOSH 582 Course or equivalent and show proof. The IH Technician shall participate in the AIHA Asbestos Analysis Registry or participate in the Proficiency Analytic Testing program of AIHA for fiber counting quality control assurance. The IH Technician shall also be an accredited EPA/State Contractor/Supervisor and Building Inspector. The IH Technician shall have participated in five abatement projects collecting personal and area samples as well as responsibility for documentation. The analytic laboratory used by the Contractor to analyze the samples shall be AIHA accredited for asbestos PAT. A daily log documenting all OSHA requirements for 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. The log will contain, at a minimum, information on personnel or area sampled, 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 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 personal samples per shift shall be collected and one area sample per 1,000 square feet of regulated area where abatement is taking place and one sample per shift in the clean room area shall be collected. In addition to the continuous monitoring required, the CPIH will perform inspection and testing at the final stages of abatement for each regulated area as specified in the CPIH responsibilities.

2.4 STANDARD OPERATING PROCEDURES

The Contractor shall have established Standard Operating Procedures (SOP's) in printed form and loose leaf folder consisting of simplified text, diagrams, sketches, and pictures that establish and explain clearly the ways and procedures to be followed during all phases of the work by the Contractor's personnel. The SOP's must be modified as needed to address specific requirements of the project. The SOP's shall be submitted for review and approval prior to the start of any abatement work. The minimum topics and areas to be covered by the SOP's are:

A. Minimum Personnel Qualifications

B. Contingency Plans and Arrangements
C. Security and Safety Procedures
D. Respiratory Protection/Personal Protective Equipment Program and Training
E. Medical Surveillance Program and Recordkeeping
F. Regulated Area Requirements for Glovebag Abatement
G. Decontamination Facilities and Entry/Exit Procedures (PDF and W/EDF)
H. Monitoring, Inspections, and Testing
I. Removal Procedures For Piping ACM Using the Glovebag Method
J. Disposal of ACM waste
K. Regulated Area Decontamination/Clean-up
L. Regulated Area Visual and Air Clearance
M. Project Completion/Closeout

2.5 SUBMITTALS

2.5.1 PRE-CONSTRUCTION MEETING SUBMITTALS

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 Standard Operating Procedures developed specifically for this project, incorporating the requirements of the specifications, prepared, signed and dated by the CPIH.
D. Submit the specifics of the materials and equipment to be used for this project with brand names, model numbers, performance characteristics, pictures/diagrams, and number available for the following:
   1. HEPA vacuums, air monitoring pumps, calibration devices, and emergency power generating system.
   2. Waste water filtration system, shower system, critical/floor barriers.
   3. Encapsulants, surfactants, hand held sprayers, airless sprayers, glovebags, fire extinguishers.
   4. Personal protective equipment.
   5. 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. Air monitoring must be done in accordance with OSHA 29 CFR 1926.1101(f) and Appendix A.

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, penalties, damages paid and legal actions taken against the company 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; provide references; phone numbers; copies of certificates, accreditations, and licenses. Submit an affidavit signed by the CPIH stating that all personnel submitted below have medical records in accordance with OSHA 29 CFR 1926.1101(m) and 29 CFR 1910.20 and that the company has implemented a medical surveillance program and maintains recordkeeping in accordance with the above regulations. Submit the phone number and doctor/clinic/hospital used for medical evaluations.

   1. CPIH: 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; number of workers trained; samples of training materials; samples of SOP's developed; medical opinion; current respirator fit test.

2. Competent Person(s)/Supervisor(s): Number; names; social security numbers; years of abatement experience as Competent Person /Supervisor; list of similar projects 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; current respirator fit test.
3. Workers: Numbers; names; social security numbers; years of abatement experience; certificates, licenses, accreditations; training courses in asbestos abatement and respiratory protection; medical opinion; 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 english the coverage provided and the fact that asbestos abatement activities are covered by the policy; copy of SOP's incorporating the requirements of this specification; information on who provides your training, how often; who provides medical surveillance, how often; who does and how is air monitoring conducted; a list of references of independent laboratories/IH's familiar with your air monitoring and standard operating procedures; copies of monitoring results of the five referenced projects listed and analytical method(s) used.

K. When rental equipment is to be used in regulated areas or used to transport asbestos waste, the contractor shall assure complete decontamination of the rental equipment before return to the rental agency.
1. Submit, before the start of work, the manufacturer's technical data and MSDS for encapsulants used on the project. Provide application instructions also.

2.5.2 SUBMITTALS DURING ABATEMENT

A. 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 critical barrier breeching, equipment failures, emergencies, and any cause for stopping work; representative air monitoring and results/TWA's/EL's. Submit this daily log to VA's representative.

B. The CPIH shall document and maintain the following during abatement and submit as appropriate to the VA's representative.
1. Inspection and approval of the regulated area preparation prior to start of work and daily during work.

2. Removal of any poly critical/floor barriers.
3. Visual inspection/testing by the CPIH prior to application of lockdown encapsulation.
4. Packaging and removal of ACM waste from regulated area.
5. Disposal of ACM waste materials; copies of Waste Shipment Records/landfill receipts to the VA's representative on a weekly basis.

2.5.3 SUBMITTALS AT COMPLETION OF ABATEMENT

The CPIH 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. The report shall include a certificate of completion, signed and dated by the CPIH, in accordance with Attachment #1. The VA Representative will forward the abatement report to the Medical Center after completion of the project.

2.6 ENCAPSULANTS

2.6.1 TYPES OF ENCAPSULANTS

A. The following four types of encapsulants must comply with comply with performance requirements as stated in paragraph 2.6.2:
   1. Removal encapsulant - used as a wetting agent to remove ACM.
   2. Bridging encapsulant - provides a tough, durable coating on ACM.
   3. Penetrating encapsulant - penetrates/encapsulates ACM at least 13 mm (1/2").
   4. Lockdown encapsulant - seals microscopic fibers on surfaces after ACM removal.

2.6.2 PERFORMANCE REQUIREMENTS

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 - 24 kPa (50 lbs/ft^2).
   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 11.5 kg-mm (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 - 48 kPa (100 lbs/ft^2) (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 off-gassing any noxious vapors during application.

2.7 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.

2.8 RECYCLABLE PROTECTIVE CLOTHING

If recyclable clothing is provided, all requirements of EPA, DOT and OSHA shall be met.

PART 3 - EXECUTION

3.1 PRE-ABATEMENT ACTIVITIES

3.1.1 PRE-ABATEMENT MEETING

The VA representative, upon receipt, review, and substantial approval of all pre-abatement submittals and verification by the CPIH 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, 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.

3.1.2 PRE-ABATEMENT INSPECTIONS AND PREPARATIONS

Before any work begins on the construction of the regulated area, the Contractor will:

A. 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.
B. The VA Representative, the Contractor, and the VPIH/CIH must be aware of 10/95 A/E Quality Alert indicating the failure to identify asbestos as applicable to glovebag abatement in the areas listed. Make sure these areas are looked at/reviewed on the project: Lay-in ceilings concealing ACM; ACM behind walls/windows from previous renovations; inside chases/walls; transite piping/ductwork/sheets; behind radiators; below window sills; water/sewer lines; electrical conduit coverings; steam line trench coverings.
C. Ensure that all furniture, machinery, equipment, curtains, drapes, blinds, and other movable objects which the Contractor is required to remove from the regulated area have been cleaned and removed or properly protected from contamination.
D. Shut down and seal with a minimum of 2 layers of 6 mil fire retardant poly all HVAC systems serving the regulated area. The regulated area critical barriers shall be completely isolated from any other air in the building. The VA's representative will monitor the isolation provision.
E. Shut down and lock out in accordance with 29 CFR 1910.147 all electrical circuits which pose a potential hazard. Electrical arrangements will be tailored to the particular regulated area and the systems involved. All electrical circuits affected will be turned off at the circuit box outside the regulated area, not just the wall switch. The goal is to eliminate the potential for electrical shock which is a major threat to life in the regulated area due to water use and possible energized circuits. Electrical lines used to power equipment in the regulated area shall conform to all electrical safety standards and shall be isolated by the use of a ground fault circuit interrupter (GFCI). All GFCI shall be tested prior to use. The VA's representative will monitor the electrical shutdown.
F. If required, remove and dispose of carpeting from floors in the regulated area.
G. Inspect existing firestopping in the regulated area. Correct as needed.

3.1.3 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 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 SOP's, especially worker protection, respiratory systems, contingency plans, decontamination procedures, and monitoring to demonstrate satisfactory operation.

C. The CPIH 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.

3.2 REGULATED AREA PREPARATIONS

3.2.1 OSHA DANGER SIGNS

Post OSHA DANGER signs meeting the specifications of OSHA 29 CFR 1926.1101 at any location and approaches to the regulated area where airborne concentrations of asbestos may exceed ambient background levels. 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.

3.2.2 SHUT DOWN - LOCK OUT ELECTRICAL

Shut down and lock 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 requirements and OSHA requirements for temporary electrical systems. Electricity shall be provided by the VA.

3.2.3 SHUT DOWN - LOCK OUT HVAC

Shut down and lock 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 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 poly disposal bags for disposal as asbestos waste.

3.2.4 SANITARY FACILITIES

The Contractor shall provide sanitary facilities for abatement personnel and maintain them in a clean and sanitary condition throughout the abatement project.

3.2.5 WATER FOR ABATEMENT

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.

3.2.6 PRE-CLEANING MOVABLE OBJECTS

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.

3.2.7 PRE-CLEANING FIXED OBJECTS

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 precleaning, 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.

3.2.8 PRE-CLEANING SURFACES IN THE REGULATED AREA

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.

3.3 CONTAINMENT BARRIERS AND COVERINGS FOR THE REGULATED AREA

3.3.1 GENERAL

Seal off any openings at the perimeter of the regulated area with critical barriers to completely isolate the regulated area and to contain all airborne asbestos contamination created by the abatement activities. Should the adjacent area past the regulated area become contaminated due to improper work activities, the Contractor shall

suspend work inside the regulated area, continue wetting, and clean the adjacent areas in accordance with procedures described in these specifications. Any and all costs associated with the adjacent area cleanup shall not be borne by the VA.

3.3.2 PREPARATION PRIOR TO SEALING OFF

Place all materials, equipment and supplies necessary to isolate the regulated area inside the regulated area. Remove all movable material/equipment as described above and secure all unmovable material/equipment as described above. Properly secured material/ equipment shall be considered to be outside the regulated area.

3.3.3 CONTROLLING ACCESS TO THE REGULATED AREA

Access to the regulated area shall be permitted only through the PDF. All other means of access shall be closed off by proper sealing and DANGER signs posted on the clean side of the regulated area where it is adjacent to or within view of any occupiable area. An opaque visual barrier of 6 mil poly shall be provided so that the abatement work is not visible to any building occupants. If the area adjacent to the regulated area is accessible to the public, construct a solid barrier on the public side of the sheeting for protection and isolation of the project. The barrier shall be constructed with nominal 2" x 4" (50mm x 100mm) wood or metal studs 16" (400mm) on centers, securely anchored to prevent movement and covered with a minimum of 1/2" (12.5mm) plywood. Provide an appropriate number of OSHA DANGER signs for each visual and physical barrier. Any alternative method must be given a written approval by the VA's representative.

3.3.4 CRITICAL BARRIERS

The regulated area must be completely separated from the adjacent areas, and the outside by at least 2 layers of 6 mil fire retardant poly and duct tape/spray adhesive. Individually seal all supply and exhaust ventilation openings, lighting fixtures, clocks, doorways, windows, convectors, speakers, and other openings into the regulated area with 2 layers of 6 mil fire retardant poly, and taped securely in place with duct tape/spray adhesive. Critical barriers must remain in place until all work and clearances have been completed. Light fixtures shall not be operational during abatement. Auxiliary lighting shall be provided. If needed, provide plywood squares 6" x 6" x 3/8" (150mm x 150mm x 18mm) held in place with one 6d smooth masonry/galvanized nail driven through the center of the plywood square and duct tape on the poly so as to clamp the poly to the wall/surface. Locate plywood squares at each end, corner, and 4' (1200mm) maximum on centers.

3.3.5 EXTENSION OF THE REGULATED AREA

If the regulated area barrier is breached in any manner that could allow the passage of asbestos fibers or debris, the Competent Person shall immediately stop work, continue wetting, and proceed to extend the regulated area to enclose the affected area as per procedures described in this specification. If the affected area cannot be enclosed, decontamination measures and cleanup shall start immediately. All personnel shall be isolated from the affected area until decontamination/cleanup is completed as verified by visual inspection and air monitoring. Air monitoring at completion must indicate background levels.

3.3.6 FLOOR BARRIERS:

All floors within 10’ of glovebag work shall be covered with 2 layers of 6 mil fire retardant poly.

3.4 REMOVAL OF PIPING ACM

3.4.1 WETTING MATERIALS

A. 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's 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.

B. Amended Water: Provide water to which a surfactant has been added shall be used 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 one ounce of 50% polyoxyethylene ester and 50% polyoxyethylene ether mixed with 5 gallons (19L) of water.

C. Removal Encapsulant: Provide a penetrating 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 disturbance equal to or greater than the amended water described above in B.

3.4.2 SECONDARY BARRIER AND WALKWAYS

A. 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 within 10 feet (3M) of the area where work is to done. Secure the secondary barrier with duct tape to prevent 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.

B. Install walkways using 6 mil poly between the regulated area and the decontamination facilities (PDF and W/EDF) to protect the floor from contamination and damage. Install the walkways at the beginning of each shift and remove at the end of each shift.

3.4.3 WET REMOVAL OF ACM

Using acceptable glovebag procedures, adequately and thoroughly wet the ACM to be removed prior to removal to reduce/prevent fiber release to the air. Adequate time must be allowed for the amended water 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 in the case of electrical hazards or a greater safety issue is possible!

3.5 GLOVEBAG REMOVAL PROCEDURES

3.5.1 GENERAL

All applicable OSHA requirements and glovebag manufacturer’s recommendations shall be met during glove bagging operations.

1. Mix the surfactant with water in the garden sprayer, following the manufacturer's directions.
2. Have each employee put on a HEPA filtered respirator approved for asbestos and check the fit using the positive/negative fit check.
3. Have each employee put on a disposable full-body suit. Remember, the hood goes over the respirator straps.
4. Check closely the integrity of the glove bag to be used. Check all seams, gloves, sleeves, and glove openings. OSHA requires the bottom of the bag to be seamless.
5. Check the pipe where the work will be performed. If it is damaged (broken lagging, hanging, etc.), wrap the entire length of the pipe in poly sheeting and "candy stripe" it with duct tape.
6. Attach glovebag with required tools per manufacturer’s instructions.
7. Using the smoke tube and aspirator bulb, test 10% of glovebags by placing the tube into the water porthole (two-inch opening to glove

bag), and fill the bag with smoke and squeeze it. If leaks are found, they should be taped closed using duct tape and the bag should be retested with smoke.

8. Insert the wand from the water sprayer through the water porthole.
9. Insert the hose end from a HEPA vacuum into the upper portion of the glove bag.
10. Wet and remove the pipe insulation.
11. If the section of pipe is covered with an aluminum jacket, remove it first using the wire cutters to cut any bands and the tin snips to remove the aluminum. It is important to fold the sharp edges in to prevent cutting the bag when placing it in the bottom.
12. When the work is complete, spray the upper portion of the bag and clean-push all residue into the bottom of the bag with the other waste material. Be very thorough. Use adequate water.
13. Put all tools, after washing them off in the bag, in one of the sleeves of glove bag and turn it inside out, drawing it outside of the bag. Twist the sleeve tightly several times to seal it and tape it several tight turns with duct tape. Cut through the middle of the duct tape and remove the sleeve. Put the sleeve in the next glove bag or put it in a bucket of water to decontaminate the tools after cutting the sleeve open.
14. Turn on the HEPA vacuum and collapse the bag completely. Remove the vacuum nozzle, seal the hole with duct tape, twist the bag tightly several times in the middle, and tape it to keep the material in the bottom during removal of the glove bag from the pipe.
15. Slip a disposal bag over the glove bag (still attached to the pipe). Remove the tape securing the ends, and slit open the top of the glove bag and carefully fold it down into the disposal bag. Double bag and gooseneck waste materials.

3.5.2 NEGATIVE PRESSURE GLOVEBAG PROCEDURE

1. In addition to the above requirements, the HEPA vacuum shall be run continuously during the glovebag procedure until completion at which time the glovebag will be collapsed by the HEPA vacuum prior to removal from the pipe/component.
2. The HEPA vacuum shall be attached and operated as needed to prevent collapse of the glovebag during the removal process.

3.5.3 REMOVAL OF CLASS II FLOORING; ROOFING; AND TRANSITE MATERIALS:

All applicable requirements of OSHA, EPA, and DOT shall be followed during Class II work. Wet materials prior to removal, keep materials intact; do not disturb; wet while working with it; wrap as soon as possible with 2 layers of 6 mil plastic for disposal.

3.5.4 REMOVAL OF FLOORING MATERIALS:

A. All requirements of OSHA Flooring agreement provisions shall be followed:

1. Negative air machine shall be used to effect some negative pressure in the regulated area. A spare machine shall be available.
2. Follow RFCI recommended work practices for removal of resilient Floor coverings.
3. Mechanical chipping or sanding is not allowed.
4. Wet clean and HEPA vacuum the floor before and after removal of flooring.
5. Place a 6 mil poly layer 4’ by 10’ adjacent to the regulated area for use as a decontaminated area. All waste must be contained in the regulated area.
6. Package all waste in 6 mil poly lined fiberboard drums.

3.5.5 REMOVAL OF MASTIC

A. The mastic removal material must be a "low odor" or "no odor" material.

B. Follow RFCI recommended work practices for removal of mastic.

A. Package all waste in 6 mil poly lined fiberboard drums.

3.6 LOCKDOWN ENCAPSULATION

3.6.1 GENERAL

Lockdown encapsulation is an integral part of the ACM removal. At the conclusion of ACM removal and before removal of the primary barriers, all surfaces shall be encapsulated with a bridging encapsulant.

3.6.2 SEALING EXPOSED EDGES

Seal edges of ACM exposed by removal work with two coats of encapsulant. Prior to sealing, permit the exposed edges to dry completely to permit penetration of the encapsulant.

3.7 DISPOSAL OF ACM WASTE MATERIALS

3.7.1 GENERAL

Dispose of waste ACM and debris which is packaged in accordance with these specifications, OSHA, EPA and DOT. The landfill requirements for packaging must also be met. Disposal shall be done at the approved landfill. Disposal of non-friable ACM shall be done in accordance with applicable regulations.

3.7.2 PROCEDURES

A. 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 prior to disposal. Wetted waste can be very heavy. Bags shall not be overfilled. Bags shall securely sealed to prevent accidental opening and/or leakage. The top

shall be tightly twisted and goosenecked 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's 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.

B. Waste Load Out: Waste load out shall be done in accordance with the procedures in W/EDF Decontamination Procedures. Bags shall be decontaminated on exterior surfaces by wet cleaning and/or HEPA vacuuming before being placed in the second bag. C. 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.

3.8 PROJECT DECONTAMINATION

3.8.1 GENERAL

A. The entire work related to project decontamination shall be performed under the close supervision and monitoring of the CPIH.

B. 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 cleaning of the regulated area surfaces after the primary barrier removal.

C. 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.

3.8.2 REGULATED AREA 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.

3.8.3 WORK DESCRIPTION

Decontamination includes the cleaning and clearance of the air 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.

3.8.4 PRE-DECONTAMINATION CONDITIONS

A. Before decontamination starts, all ACM waste from the regulated area shall be removed, all waste collected and removed, and the secondary barrier of poly removed and disposed of along with any gross debris generated by the work.

B. At the start of decontamination, the following shall be in place:

1. Critical barriers over all openings consisting of two layers of 6 mil poly which is the sole barrier between the regulated area and the rest of the building or outside.
2. Decontamination facilities, if required for personnel and equipment in operating condition.

3.8.5 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/or HEPA vacuuming. Do not use dry dusting/sweeping methods. Use each surface of a 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. If determined by the CPIH/VPIH/CIH additional cleaning(s) may be needed.

3.8.6 PRE-CLEARANCE INSPECTION AND TESTING

The CPIH and VPIH/CIH will perform a thorough and detailed visual inspection after the first cleaning to determine whether there is any visible residue in the regulated area. If the visual inspection is acceptable, the CPIH 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 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.

3.8.7 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.

3.9 FINAL VISUAL INSPECTIONS AND AIR CLEARANCE TESTING

3.9.1 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 after the final cleaning.

3.9.2 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 cost to the VA. Dust/material samples may be collected and analyzed at no 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.

3.9.3 FINAL AIR CLEARANCE TESTING

A. After an acceptable final visual inspection by the VPIH/CIH and VA Representative, the VPIH/CIH will perform the final testing. Air samples will be collected and analyzed in accordance with procedures for PCM/TEM in this specification. If the release criteria are not met, the Contractor shall repeat the final cleaning and continue decontamination procedures. Additional inspection and testing will be done at the expense of the Contractor.

B. If the results of the PCM/TEM are acceptable, remove the critical barriers. Any small quantities of residue material found upon removal of the poly shall be removed with a HEPA vacuum and localized isolation. If significant quantities are found as determined by the VPIH/CIH, then the entire area affected shall be cleaned as specified in the final cleaning.

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

3.9.4 FINAL AIR CLEARANCE PROCEDURES

A. 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 with PCM/TEM methods.

B. 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:

1. 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 TEM method.
2. Aggressive Sampling: All final air testing samples shall be collected using aggressive sampling techniques. Samples will be collected on 0.8µ MCE filters for PCM analysis and 0.45µ Polycarbonate filters for TEM analysis. Before pumps are started, initiate aggressive 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.

3.9.5 CLEARANCE SAMPLING USING PCM

The NIOSH 7400 method will be used for clearance sampling with a minimum collection volume of 1200 Liters of air. A minimum of 5 PCM clearance samples will be collected.

3.9.6 CLEARANCE SAMPLING USING TEM

TEM clearance requires a minimum of 13 samples taken and analyzed, including five samples in the regulated area, five samples outside the regulated area and three field blanks using polycarbonate filters.

3.9.7 LABORATORY TESTING OF PCM SAMPLES

The services of an AIHA accredited laboratory will be employed by the VA to perform analysis of the air samples. Samples will be sent by the VPIH/CIH so that verbal/faxed reports can be received within 24 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.

3.9.8 LABORATORY TESTING OF TEM SAMPLES

Samples shall be sent by the VPIH/CIH to an accredited laboratory for analysis by TEM. Verbal/faxed results from the laboratory shall be available within 24 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.

3.10 ABATEMENT CLOSEOUT AND CERTIFICATE OF COMPLIANCE

3.10.1 COMPLETION OF ABATEMENT WORK

After thorough decontamination, complete asbestos abatement work upon meeting the regulated area clearance criteria and fulfilling the following:

A. Remove all equipment, materials, and debris from the project area.
B. Package and dispose of all asbestos waste as required.

C. Repair or replace all interior finishes damaged during the abatement work.

D. Fulfill other project closeout requirements as specified elsewhere in this specification.

3.10.2 CERTIFICATE OF COMPLETION BY CONTRACTOR

The CPIH 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.

3.10.3 WORK SHIFTS

All work shall 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.

3.10.4 RE-INSULATION

Replace all asbestos containing insulation with suitable non-asbestos material. Provide MSDS’s for all replacement materials.

ATTACHMENT #1

CERTIFICATE OF COMPLETION

DATE:

PROJECT NAME:

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 glovebag work was done in accordance with OSHA requirements and the manufacturer’s recommendations.

   CPIH Name:

   Signature/Date:

   Asbestos Abatement Contractor's Name:

   Signature/Date:

ATTACHMENT #2

CERTIFICATE OF WORKER'S ACKNOWLEDGMENT

DATE:

PROJECT NAME:

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 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: Social Security Number:

Printed Name: 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: Date:

   Printed Name of CPIH:

   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:

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.

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.

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

Abatement Contractor Competent Person(s) Date

Date

Date

- E N D -

SECTION 03 30 53
CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 DESCRIPTION:

This section specifies cast-in-place material and mixes for concrete.

1.2 RELATED WORK:

B. Concrete walks, equipment pads and similar exterior site work: Section 32 05 23, CEMENT AND CONCRETE FOR EXTERIOR IMPROVEMENTS.

1.3 TOLERANCES:

A. ACI 117.

B. Slab Finishes: ACI 117, F-number method in accordance with ASTM E1155.

1.4 REGULATORY REQUIREMENTS:

A. ACI SP-66 ACI Detailing Manual

B. ACI 318 - Building Code Requirements for Reinforced Concrete.

1.5 SUBMITTALS:

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Concrete Mix Design.

C. Shop Drawings: Reinforcing steel: Complete shop drawings.

D. Manufacturer's Certificates: Air-entraining admixture, chemical admixtures, curing compounds.

1.6 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. American Concrete Institute (ACI):

117R-06.....Tolerances for Concrete Construction and Materials

211.1-91(R2002).....Proportions for Normal, Heavyweight, and Mass Concrete

211.2-98(R2004).....Proportions for Structural Lightweight Concrete

301-05.....Specification for Structural Concrete

305R-06.....Hot Weather Concreting

306R-2002.....Cold Weather Concreting

SP-66-04 .....ACI Detailing Manual

318/318R-05.....Building Code Requirements for Reinforced Concrete

347R-04.....Guide to Formwork for Concrete

C. American Society for Testing And Materials (ASTM):

A185-07.....Steel Welded Wire, Fabric, Plain for Concrete Reinforcement
A615/A615M-08.....Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
A996/A996M-06.....Standard Specification for Rail-Steel and Axle-Steel Deformed Bars for Concrete Reinforcement
C31/C31M-08.....Making and Curing Concrete Test Specimens in the Field
C33-07.....Concrete Aggregates
C39/C39M-05.....Compressive Strength of Cylindrical Concrete Specimens
C94/C94M-07.....Ready-Mixed Concrete
C143/C143M-05.....Standard Test Method for Slump of Hydraulic Cement Concrete
C150-07.....Portland Cement
C171-07.....Sheet Material for Curing Concrete
C172-07.....Sampling Freshly Mixed Concrete
C173-07.Air Content of Freshly Mixed Concrete by the Volumetric Method
C192/C192M-07.....Making and Curing Concrete Test Specimens in the Laboratory
C231-08.....Air Content of Freshly Mixed Concrete by the Pressure Method
C260-06.....Air-Entraining Admixtures for Concrete
C330-05.....Lightweight Aggregates for Structural Concrete
C494/C494M-08.....Chemical Admixtures for Concrete
C618-08.....Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
D1751-04.Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types)
D4397-02.....Polyethylene Sheeting for Construction, Industrial and Agricultural Applications
E1155-96(2008).....Determining F_F Floor Flatness and F_L Floor Levelness Numbers

PART 2 - PRODUCTS

2.1 FORMS:

Wood, plywood, metal, or other materials, approved by Resident Engineer, of grade or type suitable to obtain type of finish specified.

2.2 MATERIALS:

A. Portland Cement: ASTM C150, Type I or II.

B. Fly Ash: ASTM C618, Class C or F including supplementary optional requirements relating to reactive aggregates and alkalis, and loss on ignition (LOI) not to exceed 5 percent.
C. Coarse Aggregate: ASTM C33, Size 67. Size 467 may be used for footings and walls over 300 mm (12 inches) thick. Coarse aggregate for applied topping and metal pan stair fill shall be Size 7.
D. Fine Aggregate: ASTM C33.
E. Mixing Water: Fresh, clean, and potable.
F. Air-Entraining Admixture: ASTM C260.
G. Chemical Admixtures: ASTM C494.
H. Vapor Barrier: ASTM D4397, 0.25 mm (10 mil).
I. Reinforcing Steel: ASTM A615 or ASTM A996, deformed.
J. Welded Wire Fabric: ASTM A185.
K. Expansion Joint Filler: ASTM D1751.
L. Sheet Materials for Curing Concrete: ASTM C171.

2.3 CONCRETE MIXES:

A. Design of concrete mixes using materials specified shall be the responsibility of the Contractor as set forth under Option C of ASTM C94.
B. Compressive strength at 28 days shall be not less than 3000 psi.
C. Establish strength of concrete by testing prior to beginning concreting operation. Test consists of average of three cylinders made and cured in accordance with ASTM C192 and tested in accordance with ASTM C39.
D. Maximum slump for vibrated concrete is 100 mm (4 inches) tested in accordance with ASTM C143.
E. Cement and water factor (See Table I):

TABLE I - CEMENT AND WATER FACTORS FOR CONCRETE

Concrete: Strength	Non-Air-Entrained		Air-Entrained	
Min. 28 Day Comp. Str. MPa (psi)	Min. Cement kg/m^3 (lbs/c. yd)	Max. Water Cement Ratio	Min. Cement kg/m^3 (lbs/c. yd)	Max. Water Cement Ratio
25 (3000)[1,2]	300 (500)	*	310 (520)	*

1. If trial mixes are used, the proposed mix design shall achieve a compressive strength 8.3 MPa (1200 psi) in excess of f'c. For concrete strengths above 35 Mpa (5000 psi), the proposed mix design shall achieve a compressive strength 9.7 MPa (1400 psi) in excess of f’c.

2. Lightweight Structural Concrete. Pump mixes may require higher cement values.
3. For concrete exposed to high sulfate content soils maximum water cement ratio is 0.44.

* Determined by Laboratory in accordance with ACI 211.1 for normal concrete or ACI 211.2 for lightweight structural concrete.

F. Air-entrainment is required for all exterior concrete and as required for Section 32 05 23, CEMENT AND CONCRETE FOR EXTERIOR IMPROVEMENTS. Air content shall conform with the following table:

TABLE I - TOTAL AIR CONTENT FOR VARIOUS SIZES OF COARSE AGGREGATES (NORMAL CONCRETE)

Nominal Maximum Size of Coarse Aggregate	Total Air Content Percentage by Volume
10 mm (3/8 in)	6 to 10
13 mm (1/2 in)	5 to 9
19 mm (3/4 in)	4 to 8
25 mm (1 in)	3 1/2 to 6 1/2
40 mm (1 1/2 in)	3 to 6

2.4 BATCHING & MIXING:

A. Store, batch, and mix materials as specified in ASTM C94.
1. Job-Mixed: Concrete mixed at job site shall be mixed in a batch mixer in manner specified for stationary mixers in ASTM C94.
2. Ready-Mixed: Ready-mixed concrete comply with ASTM C94, except use of non-agitating equipment for transporting concrete to the site will not be permitted. With each load of concrete delivered to project, ready-mixed concrete producer shall furnish, in duplicate, certification as required by ASTM C94.

PART 3 - EXECUTION

3.1 FORMWORK:

A. Installation conform to ACI 347. Sufficiently tight to hold concrete without leakage, sufficiently braced to withstand vibration of concrete, and to carry, without appreciable deflection, all dead and live loads to which they may be subjected.

B. Treating and Wetting: Treat or wet contact forms as follows:
1. Coat plywood and board forms with non-staining form sealer. In hot weather cool forms by wetting with cool water just before concrete is placed.

2. Clean and coat removable metal forms with light form oil before reinforcement is placed. In hot weather cool metal forms by thoroughly wetting with water just before placing concrete.
3. Use sealer on reused plywood forms as specified for new material.

C. Inserts, sleeves, and similar items: Flashing reglets, masonry ties, anchors, inserts, wires, hangers, sleeves, boxes for floor hinges and other items specified as furnished under this and other sections of specifications and required to be in their final position at time concrete is placed shall be properly located, accurately positioned and built into construction, and maintained securely in place.

D. Construction Tolerances:
1. Contractor is responsible for setting and maintaining concrete formwork to assure erection of completed work within tolerances specified to accommodate installation or other rough and finish materials. Remedial work necessary for correcting excessive tolerances is the responsibility of the Contractor. Erected work that exceeds specified tolerance limits shall be remedied or removed and replaced, at no additional cost to the Government.
2. Permissible surface irregularities for various classes of materials are defined as "finishes" in specification sections covering individual materials. They are to be distinguished from tolerances specified which are applicable to surface irregularities of structural elements.

3.2 REINFORCEMENT:

Details of concrete reinforcement, unless otherwise shown, in accordance with ACI 318 and ACI SP-66. Support and securely tie reinforcing steel to prevent displacement during placing of concrete.

3.3 PLACING CONCRETE:

A. Remove water from excavations before concrete is placed. Remove hardened concrete, debris and other foreign materials from interior of forms, and from inside of mixing and conveying equipment. Obtain approval of Resident Engineer before placing concrete. Provide screeds at required elevations for concrete slabs.

B. Before placing new concrete on or against concrete which has set, existing surfaces shall be roughened and cleaned free from all laitance, foreign matter, and loose particles.

C. Convey concrete from mixer to final place of deposit by method which will prevent segregation or loss of ingredients. Do not deposit in work concrete that has attained its initial set or has contained its water or cement more than 1 1/2 hours. Do not allow concrete to drop freely more than 1500 mm (5 feet) in unexposed work nor more than 900 mm (3 feet) in

exposed work. Place and consolidate concrete in horizontal layers not exceeding 300 mm (12 inches) in thickness. Consolidate concrete by spading, rodding, and mechanical vibrator. Do not secure vibrator to forms or reinforcement. Vibration shall be carried on continuously with placing of concrete.

D. Hot weather placing of concrete: Follow recommendations of ACI 305R to prevent problems in the manufacturing, placing, and curing of concrete that can adversely affect the properties and serviceability of the hardened concrete.

E. Cold weather placing of concrete: Follow recommendations of ACI 306R, to prevent freezing of thin sections less than 300 mm (12 inches) and to permit concrete to gain strength properly, except that use of calcium chloride shall not be permitted without written approval from Resident Engineer.

3.4 PROTECTION AND CURING:

Protect exposed surfaces of concrete from premature drying, wash by rain or running water, wind, mechanical injury, and excessively hot or cold temperature. Curing method shall be subject to approval by Resident Engineer.

3.5 FORM REMOVAL:

Forms remain in place until concrete has a sufficient strength to carry its own weight and loads supported. Removal of forms at any time is the Contractor's sole responsibility.

3.6 SURFACE PREPARATION:

Immediately after forms have been removed and work has been examined and approved by Resident Engineer, remove loose materials, and patch all stone pockets, surface honeycomb, or similar deficiencies with cement mortar made with 1 part portland cement and 2 to 3 parts sand.

3.7 FINISHES:

A. Slab Finishes:

1. Floating: Allow water brought to surface by float used for rough finishing to evaporate before surface is again floated or troweled. Do not sprinkle dry cement on surface to absorb water.
2. Float Finish: Ramps, stair treads, and platforms, both interior and exterior, equipment pads, and slabs to receive non-cementitious materials, except as specified, shall be screened and floated to a smooth dense finish. After first floating, while surface is still soft, surfaces shall be checked for alignment using a straightedge or template. Correct high spots by cutting down with a trowel or similar tool and correct low spots by filling in with material of same

composition as floor finish. Remove any surface projections on floated finish by rubbing or dry grinding. Refloat the slab to a uniform sandy texture.

3. Steel Trowel Finish: Applied toppings, concrete surfaces to receive resilient floor covering or carpet, future floor roof and all monolithic concrete floor slabs exposed in finished work and for which no other finish is shown or specified shall be steel troweled. Final steel troweling to secure a smooth, dense surface shall be delayed as long as possible, generally when the surface can no longer be dented with finger. During final troweling, tilt steel trowel at a slight angle and exert heavy pressure on trowel to compact cement paste and form a dense, smooth surface. Finished surface shall be free of trowel marks, uniform in texture and appearance.
4. Broom Finish: Finish all exterior slabs, ramps, and stair treads with a bristle brush moistened with clear water after the surfaces have been floated.
5. Finished slab flatness (FF) and levelness (FL) values comply with the following minimum requirements:

Slab on grade	
Specified overall value	F_F 25/F_L 20
Minimum local value	F_F 17/F_L 15

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SECTION 04 05 31
MASONRY TUCK POINTING

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section specifies requirements for tuck pointing of existing masonry and stone work.

1.2 RELATED WORK

A. Sealants: Section 07 92 00 JOINT SEALANTS.

1.3 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 Society for Testing and Materials (ASTM):

C67-07.....Brick and Structural Clay Tile, Sampling and Testing

C216-07.....Facing Brick (Solid Masonry Units Made From Clay or Shale)

C270-07.....Mortar for Unit Masonry

C. International Masonry Institute: Recommended Practices and Guide Specifications for Cold Weather Masonry Construction.

D. National Park Service: Technical Preservation Brief 2 – Repointing Mortar Joints in Historic Masonry Buildings

1.4 FIELD TESTING

A. Mason shall remove several samples of existing brick and stone mortar for field analysis prior to final selection of mortar mix products.

B. Several samples of both types of mortar shall be obtained. A single, large sample of each shall be retained for comparison and “sample” submittal purposes.

C. Samples shall be taken from those that appear to be original; avoid use of samples that are obviously not original.

D. Using a wooden mallet, all but the single large samples identified above shall be broken down and separated into binder and aggregate.

E. In order to establish binder material, stir part of the binder samples in diluted hydrochloric acid. Vigorous chemical reaction(bubbling) and disappearance of material is generally an indication the binder is lime. Lack of a reaction and the presence of murky liquid is generally an indication the binder is cement.

1.5 SUBMITTALS

A. Section 01 33 23 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

B. Field Test Report: Submit a written report describing results from Field Testing identifying binder material (lime, cement, or combination) and detailed description of aggregate size(s) and color.

C. Product Literature for restoration cleaning products.

D. Samples: Submit samples of existing aggregate and proposed aggregate for each type of mortar (brick and stone).

E. Samples: Submit samples of existing mortar and proposed new mortar to demonstrate the proposed new mortar matches existing. Samples shall be not less than 3/8″ x 3/8″ x 4″ mounted on 6″ x 6″ x 1/4″ plywood with project identification information. Submit (1) set of samples for brick and (1) set of samples for stone.

1.6 QUALIFICATIONS

A. Installer: Company specializing in performing masonry restoration services with not less than 5 years documented experience. Persons performing the work on this project shall have not less than 1 year documented experience working with the restoration company performing the work.

1.7 MOCK-UP

A. Following approval of proposed pointing mortar mix repoint a 4’x4’ portion of brick and not less 2 linear feet of combined stone head and bed joints.

B. Obtain written approval from RE/COTR **AND** the State Historic Preservation Officer before proceeding with the work.

1.8 ENVIRONMENTAL REQUIREMENTS

A. Cold Weather Requirements: In accordance with ACI 530.1 when ambient temperature or temperature of masonry units is less than 40 degrees F.

B. Hot Weather Requirements: In accordance with ACI 530.1 when ambient temperature is greater than 100 degrees F or ambient temperature is greater than 90 degrees F with wind velocity greater than 8 mph.

1.9 SEQUENCING

a. Perform repointing after initial cleaning of masonry surfaces.

PART 2 - PRODUCTS

2.1 TUCK POINTING MORTAR

A. For bidding purposes mortar mix shall be assumed to be medium strength restoration quality mix consisting of:

1. 1 part cement: ASTM C150, Type I, white
2. 1.25 parts hydrated lime: ASTM C207, Type N
3. 7-9 parts sand: ASTM C144 color and size mixed to match existing

2.2 CLEANING MATERIALS

A. Restoration grade alkaline-based pre-wash cleaning compound formulated to dissolve heavy carbon encrustations from brick and limestone followed by mild organic acid cleaning compound which neutralize alkaline based prewash products.

PART 3 - EXECUTION

3.1 CUT OUT OF EXISTING MORTAR JOINTS

A. Cut out existing mortar joints (both bed and head joints) and remove by means of a toothing chisel or a special pointer's grinder, to a uniform depth of to (3/4-inch) for brick and 2 x face dimension of stone joints, or until sound mortar is reached. Take care to not damage edges of existing masonry units to remain.

B. Remove dust and debris from the joints by brushing, blowing with air or rinsing with water. Do not rinse when temperature is below freezing.

3.2 JOB CONDITIONS

A. Protection: Protect newly pointed joints from rain, until pointed joints are sufficiently hard enough to prevent damage.

B. Cold Weather Protection:

1. Tuck pointing may not be performed in freezing weather.
2. Comply with applicable sections of "Recommended Practices for Cold Weather Construction" as published by International Masonry Industry All Weather Council.
3. Existing surfaces at temperatures to prevent mortar from freezing or causing other damage to mortar.

3.3 INSTALLATION OF TUCK POINTING MORTAR

A. Immediately prior to application of mortar, dampen joints to be tuck pointed. Prior to application of pointing mortar, allow masonry units to absorb surface water.

B. Tightly pack mortar into joints in thin layers, approximately 6 mm (1/4-inch) thick maximum.

C. Allow layer to become "thumbprint hard" before applying next layer.

D. Pack final layer flush with surfaces of masonry units. When mortar becomes "thumbprint hard", tool joints.

3.4 TOOLING OF JOINTS

A. Tool joints in patch work with a jointing tool to match the configuration detailed in the drawings.

3.6 CLEANING

A. Perform restoration cleaning of surfaces prior to commencement of repointing utilizing low pressure water (300 psi maximum).

B. Clean exposed masonry surfaces again utilizing low pressure water (300 psi maximum) upon completion.

B. Remove mortar droppings and other foreign substances from wall surfaces.

C. First wet surfaces with clean water, then wash down with a solution of soapless detergent specially prepared for cleaning brick.

D. Brush with stiff fiber brushes while washing, and immediately thereafter hose down with clean water.

E. Free clean surfaces from traces of detergent, foreign streaks or stains. Protect materials during cleaning operations including adjoining construction.

F. Use of muratic acid for cleaning is prohibited.

3.6 SCHEDULE

A. Repoint 100% of historic brick.

B. For bidding purposes, include repointing of 200 lineal feet of existing stone foundation joints IN ADDITION TO repointing of around all windows, all joints between brick and stone. Prior to commencement of stone repointing mason shall mark with chalk all joints where mortar is loose, missing, cracked in excess of 1/32”, or otherwise in need of replacement. Mason and RE/COTR shall measure total lineal feet of repointing required. Adjustments to cost will be made based upon contract unit cost.

C. No portion of the Kitchen addition brick veneer shall be repointed.

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SECTION 06 10 00
ROUGH CARPENTRY

PART 1 - GENERAL

1.1 DESCRIPTION

A. Section specifies wood blocking, sheathing, furring, nailers, rough hardware, flooring underlayment, and hardware for new exterior crawl space access panel.

1.2 RELATED WORK

A. Milled woodwork: Section 06 20 00, FINISH CARPENTRY.

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 150 mm (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 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 (AF&PA):
National Design Specification for Wood Construction
T10105.....Wood Design Package including NDS

C. American Institute of Timber Construction (AITC):
A190.1-02.....Structural Glued Laminated Timber

D. American Society of Mechanical Engineers (ASME):
B18.2.1A-96(R2005).....Square and Hex Bolts and Screws
B18.2.2-87(R2005).....Square and Hex Nuts
B18.6.1-81 (R2008).....Wood Screws
B18.6.4-98(R2005).....Thread Forming and Thread Cutting Tapping Screws and Metallic Drive Screws

E. American Plywood Association (APA):
E30-07.....Engineered Wood Construction Guide

F. American Society for Testing and Materials (ASTM):
D143-94(R2007).....Small Clear Specimens of Timber, Method of Testing
D1760-01.....Pressure Treatment of Timber Products

F844-07a.....Washers, Steel, Plan (Flat) Unhardened for General Use
F1667-05.....Nails, Spikes, and Staples

G. Federal Specifications (Fed. Spec.):
MM-L-736D-08.....Lumber; Hardwood

H. Forest Stewardship Council (FSC)
FSC STD 01 001.....(2000) Principles and Criteria for Forest Stewardship

I. Green Seal (GS)
GS-36.....(2000) Commercial Adhesives

J. Commercial Item Description (CID):
A-A-55615-95.....Shield, Expansion (Wood Screw and Lag Bolt Self Threading Anchors)

K. Military Specification (Mil. Spec.):
MIL-L-19140E-97.....Lumber and Plywood, Fire-Retardant Treated

L. South Coast Air Quality Management District (SCAQMD)
SCAQMD Rule 1168.....(1989; R2005) Adhesive and Sealant Applications

M. Truss Plate Institute (TPI):
TPI 1-02.....Metal Plate Connected Wood Trusses

N. U.S. Department of Commerce Product Standard (PS)
PS 1-95.....Construction and Industrial Plywood
PS 20-05.....American Softwood Lumber Standard

PART 2 - PRODUCTS

2.1 LUMBER

A. Unless otherwise specified, each piece of lumber shall bear a grade mark, stamp, or other identifying marks indicating grades of material, and rules or standards under which produced.
   1. Identifying marks 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.

B. Structural Members: Species and grade as listed in the AFPA, National Design Specification for Wood Construction having design stresses as shown.

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.
3. Furring, blocking, nailers and similar items 100 mm (4 inches) and narrower Standard Grade; and, members 150 mm (6 inches) and wider, Number 2 Grade.

D. Sizes:
1. Conforming to Prod. Std., PS20.
2. Size references are nominal sizes, unless otherwise specified, actual sizes within manufacturing tolerances allowed by standard under which produced.

E. Moisture Content:
1. At time of delivery and maintained at the site.
2. Boards and lumber 50 mm (2 inches) and less in thickness: 19 percent or less.
3. Lumber over 50 mm (2 inches) thick: 25 percent or less.

F. Preservative Treatment:
1. Do not treat Heart Redwood and Western Red Cedar.
2. Preservative treat by the pressure method complying with ASTM D1760,

2.2 PLYWOOD

A. Comply with Prod. Std., PS 1 and APA E30

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. Roof sheathing:
   a. Minimum 15 mm (19/32 inch) thick or span rating of 40/20 or 18 mm (23/32 inch) thick or span rating of 48/24 for supports 600 mm (24 inches) on center.

2.3 ROUGH HARDWARE AND ADHESIVES

A. Washers
1. ASTM F844.
2. Use zinc or cadmium coated steel or cast iron for washers exposed to weather.

B. Screws:
1. Wood to Wood: ANSI B18.6.1 or ASTM C1002.
2. Wood to Steel: ASTM C954, or ASTM C1002.

C. Nails:
1. 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.

2.4 BLOCKING

A. General: Provide miscellaneous lumber as indicated and lumber support or attachment for other construction, including the following:
1. Blocking
2. Nailers
3. Furring

PART 3 - EXECUTION

3.1 INSTALLATION OF FRAMING AND MISCELLANEOUS WOOD MEMBERS:

A. Conform to applicable requirements of the following:
1. AFPA National Design Specification for Wood Construction for timber connectors.
2. AITC Timber Construction Manual for heavy timber construction.
3. AFPA WCD-number 1, Manual for House Framing for nailing and framing unless specified otherwise.
4. APA for installation of plywood or structural use panels.
5. TPI for metal plate connected wood trusses.

B. Fasteners:
1. Nails.
a. Nail in accordance with the Recommended Nailing Schedule as specified in AFPA Manual for House Framing 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.
b. Use special nails with framing connectors.
c. For sheathing, select length of nails sufficient to extend 25 mm (1 inch) into supports.
d. Use eight penny or larger nails for nailing through 25 mm (1 inch) thick lumber and for toe nailing 50 mm (2 inch) thick lumber.
e. Use 16 penny or larger nails for nailing through 50 mm (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:

1) Joist bearing on sill or girder, toe nail three-8d or framing anchor
2) Ledger strip to beam or girder three-16d under each joint.
3) Sheathing:
   a) 150 mm (6 inch) wide or less to each joist face nail two-8d.
   b) Plywood or structural use panel to each stud or joist face nail 8d, at supported edges 150 mm (6 inches) on center and at intermediate supports 250 mm (10 inches) on center. When gluing plywood to joint framing increase nail spacing to 300 mm (12 inches) at supported edges and 500 mm (20 inches) o.c. at intermediate supports.
4) Ceiling joists, to parallel rafters, face nail three-16d.
5) Rafter to plate, toe nail three-8d. or framing anchor. Brace 25 mm (1 inch) thick board to each stud and plate, face nail three-8d.
6) Built-up girders and beams 20d at 800 mm (32 inches) on center along each edge.

2. Bolts:
   a. Fit bolt heads and nuts bearing on wood with washers.
   b. Countersink bolt heads flush with the surface of nailers.
   c. Embed in concrete and solid masonry or use expansion bolts. Special bolts or screws designed for anchor to solid masonry or concrete in drilled holes may be used.
   d. Use toggle bolts to hollow masonry or sheet metal.
   e. Use bolts to steel over 2.84 mm (0.112 inch, 11 gage) in thickness. Secure wood nailers to vertical structural steel members with bolts, placed one at ends of nailer and 600 mm (24 inch) intervals between end bolts. Use clips to beam flanges.
3. Drill Screws to steel less than 2.84 mm (0.112 inch) thick.
   a. ASTM C1002 for steel less than 0.84 mm (0.033 inch) thick.
   b. ASTM C 954 for steel over 0.84 mm (0.033 inch) thick.
4. Powder actuated drive pins may be used where practical to anchor to solid masonry, concrete, or steel.
5. Do not anchor to wood plugs or nailing blocks in masonry or concrete. Use 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 25 mm (1 inch) penetration into anchorage member.
   c. Spaced same as nails.

C. Cut notch, or bore in accordance with NFPA Manual for House-Framing for 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. Use longest lengths practicable.
   3. Use 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 600 mm (24 inches) between ends.
      c. Stagger nails from side to side of wood member over 125 mm (5 inches) in width.

E. Roof Framing:
   1. Set rafters with crown edge up.
   2. Form a true plane at tops of rafters.
   3. Valley, Ridge, and Hip Members:
      a. Size for depth of cut on rafters.
      b. Straight and true intersections of roof planes.
      c. Secure hip and valley rafters to wall plates by using framing connectors.
      d. Double valley rafters longer than the available lumber, with pieces lapped not less than 1200 mm (4 feet) and spiked together.
      e. Butt joint and scab hip rafters longer than the available lumber.
   4. Spike to wall plate and to ceiling joists except when secured with framing connectors.
   5. Frame openings in roof with headers and trimmer rafters. Double headers carrying more than one rafter unless shown otherwise.
   6. Install 50 mm by 100 mm (2 inch by 4 inch) strut between roof rafters and ceiling joists at 1200 mm (4 feet) on center unless shown otherwise.

F. Sheathing and Planking:
   1. Match existing material and layout being replaced, or as approved by architect.
   2. Lay sheathing panels with joints staggered, with edge and ends 3 mm (1/8 inch) apart and nailed over bearings as specified.
   3. Set nails not less than 9 mm (3/8 inch) from edges.
   4. Install 50 mm by 100 mm (2 inch by 4 inch) blocking spiked between joists, rafters and studs to support edge or end joints of panels.

3.2 SCHEDULE

A. Provide rough carpentry as specified on the drawings and as required to complete the work.

B. Include material and labor allowance for replacement of a total of 200 square feet of roof sheathing. The allowance shall include:

1. Removal and disposal of rotten, deteriorated, or otherwise damaged existing roof sheathing “discovered” during removal of existing roofing systems.
2. Installation of new sheathing including required anchors and fasteners.
3. Adjustment of final cost will be made using contract unit prices.

C. Provide hinges and barrel latch for new crawl space access panel.

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SECTION 06 20 00
FINISH CARPENTRY

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section specifies exterior and interior millwork.

B. Work of this section includes repairs to existing wood flooring and restoration of existing wood double hung window sashes scheduled to remain.

1.2 RELATED WORK

A. Framing, furring and blocking: Section 06 10 00, ROUGH CARPENTRY.

B. Wood doors: Section 08 14 00, WOOD DOORS.

1.3 SUBMITTALS

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Shop Drawings:

1. Millwork items – Half full size scale for sections and details 1:50 (1/4-inch) for elevations and plans.
2. Show construction and installation.

C. Certificates:

1. Indicating preservative treatment of materials meet the requirements specified.
2. Indicating moisture content of materials meet the requirements specified.

D. List of acceptable sealers for fire retardant and preservative treated materials.

E. Manufacturer's literature and data:

1. Finish hardware

1.4 DELIVERY, STORAGE AND HANDLING

A. Protect lumber and millwork from dampness, maintaining moisture content specified both during and after delivery at site.

B. Store finishing lumber and millwork in weathertight well ventilated structures or in space in existing buildings designated by RE/COTR. Store at a minimum temperature of 21^{0}C (70^{0}F) for not less than 10 days before installation.

C. Pile lumber in stacks in such manner as to provide air circulation around surfaces of each piece.

1.5 APPLICABLE PUBLICATIONS

A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.

B. American Society of Mechanical Engineers (ASME):
B18.2.1-96(R2005).....Square and Hex Bolts and Screws (Inch Series)
C. American Wood-Preservers' Association (AWPA):
AWPA C1-03.....All Timber Products – Preservative Treatment by Pressure Processes
D. Architectural Woodwork Institute (AWI):
AWI-99.....Architectural Woodwork Quality Standards and Quality Certification Program
E. U.S. Department of Commerce, Product Standard (PS):
PS1-87.....Construction and Industrial Plywood
PS20-07.....American Softwood Lumber Standard
F. Federal Specifications (Fed. Spec.):
A-A-1922A-06.....Shield Expansion
A-A-1936-06.....Contact Adhesive
FF-N-836E-94.....Nut, Square, Hexagon Cap, Slotted, Castle
FF-S-111D-00.....Screw, Wood
MM-L-736D-08.....Lumber, Hardwood

PART 2 - PRODUCTS

2.1 LUMBER

A. Sizes:
1. Lumber Size references, unless otherwise specified, are nominal sizes, and actual sizes shall be within manufacturing tolerances allowed by the standard under which product is produced.
2. Millwork, standing and running trim, and rails: Actual size as shown or specified.
B. Hardwood: MM-L-736, species as specified for each item.
C. Softwood: PS-20, exposed to view appearance grades:
1. Use C select or D select, vertical grain for transparent finish including stain transparent finish.
2. Use Prime for painted or opaque finish.

2.2 PLYWOOD

A. Softwood Plywood: PS1
1. Prod. Std.
2. Shelving Plywood:
a. Interior Type, any species group.
b. Veneer Grade: A-B or B-C.
3. Other: As specified for item.
B. Hardwood Plywood:
1. AHA A135.4

2.3 PARTICLEBOARD

A. NPA A208.1 Grade M-2

B. Do not use product with Urea Formaldayhyde.

2.4 HARDWARE

A. Rough Hardware:

1. Exposed Hardware: BHMA A156.18
2. Concealed Hardware: BHMA A156.9
3. Fasteners:
   a. Bolts with Nuts: FF-N-836.
   b. Expansion Bolts: A-A-1922A.
   c. Screws: Fed. Spec. FF-S-111.

2.5 MOISTURE CONTENT

A. Moisture content of lumber and millwork at time of delivery to site.

1 Moisture content of other materials shall be in accordance with the standards under which the products are produced.

2.6 FABRICATION

A. General:

1. Provide interior woodwork complying with referenced quality standard.
3. Finish woodwork shall be free from pitch pockets.
4. Except where special profiles are shown or specified to “match existing”, trim shall be standard stock molding and members of the same species.
5. Plywood shall be not less than 13 mm (1/2 inch), unless otherwise shown or specified.
6. Edges of members in contact with concrete or masonry shall have a square corner caulking rebate.
7. Fabricate members less than 4 m (14 feet) in length from one piece of lumber, back channeled and molded a shown.

PART 3 - EXECUTION

3.1 ENVIRONMENTAL REQUIREMENTS

A. Maintain work areas and storage areas to a minimum temperature of 21^{0}C (70^{0}F) for not less than 10 days before and during installation of interior millwork.

B. Do not install finish lumber or millwork in any room or space where wet process systems such as concrete, masonry, or plaster work are not complete and dry.

3.2 INSTALLATION

A. General:

1. Install to comply with AWI 1700.

2. Millwork receiving transparent finish shall be primed and back-painted on concealed surfaces. Set no millwork until primed and back-painted.
3. Secure trim with fine finishing nails, screws, or glue as required.
4. Set nails for putty stopping. Use washers under bolt heads where no other bearing plate occurs.
5. Seal cut edges of preservative and fire retardant treated wood materials with a certified acceptable sealer.
6. Coordinate with plumbing and electrical work for installation of fixtures and service connections in millwork items.
7. Plumb and level items unless shown otherwise.
8. Nail finish at each blocking, lookout, or other nailer and intermediate points; toggle or expansion bolt in place where nails are not suitable.
9. Exterior Work: Joints shall be close fitted, metered, tongue and grooved, rebated, or lapped to exclude water and made up in thick white lead paste in oil.
10. Install woodwork plumb and level to a tolerance of 3mm in 2400 mm (1/8” in 96”).

B. Install with butt joints in straight runs and miter at corners.

3.3 SCHEDULE

A. Provide finish carpentry as specified on the drawings and as required to complete the work.

B. For wood floor surfaces scheduled to be restored that are currently concealed from view behind carpet bidders shall assume restoration will require repair to 10% of the full floor area. Cost adjustment for actual work required will be made using contract unit prices.

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SECTION 07 01 50

Maintenance of Roofing

PART 1 - GENERAL

1.1 DESCRIPTION

A. Section includes removal of existing roofing systems in preparation for new standing seam metal roof, slate shingles, gutters, downspouts and associated flashing systems.

B. Related Sections:

1. Location of asbestos containing roof materials: Section 00 31 0 INFORMATION AVAILABLE TO BIDDERS
2. General wood framing and provisions for replacement of deteriorated plywood substrates: Section 06 10 00 – ROUGH CARPENTRY.
3. Flashing: Section 07 60 00 - SHEET METAL FLASHING AND TRIM.
4. Standing seam metal roof: Section 07611 – STANDING SEAM METAL ROOFING.
5. Slate Shingles: Section 07 31 26 – SLATE SHINGLES.

1.2 SYSTEM DESCRIPTION

A. Entire Kitchen Roof Area: Remove existing perimeter flashings, base flashings, counter flashings, vent stack flashings, and flat seam metal roof system

B. Transite shingles on Mansard Roof Area: Remove existing transite shingles and flashings as shown on drawings.

C. Selected cutting and patching of low sloped portion of Mansard roof as necessary to complete installation of new gutters; refer to drawings

D. Remove gutters and downspouts where specified on the drawings.

1.3 QUALITY ASSURANCE

A. Perform Work in accordance with authorities have jurisdiction.

1.4 QUALIFICATIONS

A. Materials Removal Firm: The company performing work of this section shall also be responsible for work of Section 07 41 13 Standing Seam Metal Roofing and Section 07 31 26 Slate Shingles.

1.5 PRE-INSTALLATION MEETINGS

A. Convene minimum one week prior to commencing work of this section.

1.6 ENVIRONMENTAL REQUIREMENTS

A. Do not remove existing roofing materials when weather conditions threaten integrity of building contents or intended continued occupancy.

B. Maintain continuous temporary protection prior to and during installation of new roofing system to keep building weather tight.

1.7 SCHEDULING

A. Schedule Work to coincide with commencement of installation of new roofing system.

1.8 COORDINATION

A. Remove only existing roofing materials being replaced with new materials same day.

B. Coordinate Work with other affected masonry, mechanical and electrical work associated with roof penetrations.

PART 2 - PRODUCTS

2.1 COMPONENTS

A. Temporary Protection: Sheet fiber reinforced plastic; furnish weights to retain sheeting in position.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify existing roof surface is clear and ready for work of this section.

3.2 PREPARATION

A. Sweep roof surface clean of loose matter.

B. Remove loose refuse and dispose off site.

3.3 EXISTING CONSTRUCTION

A. Remove gutters and downspouts.

B. Remove metal counter flashings.

C. Remove perimeter base flashings, flashings around roof protrusions, and other roof accessories specified for replacement.

D. Remove metal roof, underlayment, and all other materials down to wood substrate.

E. Remove transite shingles, underlayment and all other materials down to wood substrate.

F. Inspect existing roof deck and framing for damage; notify Architect upon discovery.

3.4 PROTECTION OF INSTALLED CONSTRUCTION

A. Install temporary protective sheeting over exposed deck surfaces.

B. Turn sheeting up and over parapets and curbing. Retain sheeting in position with weights or temporary fasteners.

C. Provide for surface drainage from sheeting to existing drainage facilities.

D. Do not permit traffic over unprotected or repaired deck surface.

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SECTION 07 31 26
SLATE SHINGLES

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section specifies slate shingles secured to wood or plywood sheathing.

1.2 RELATED WORK

A. Flashing at projections through roof and other flashing: Section 07 60 00, FLASHING AND SHEET METAL.

B. Wood substrate: Section 06 10 00 ROUGH CARPENTRY.

1.3 INSTALLERS QUALIFICATIONS

A. Roofer shall be experienced in slate roofing work, and upon request, shall provide the names and addresses of three successfully completed, similar projects.

1.4 QUALITY ASSURANCE

A. Roof slate materials shall be furnished from a single source and each slate color shall be furnished from the same “color lot”.

1.5 SUBMITTALS

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Samples: Slate, not less than two, 300 mm (12 inches) square. Submit enough samples to show the range and extremes of color and texture.

C. Certifications:

1. Certify that the roofer is experienced in slate roofing work. When required by the Resident Engineer, provide project names as specified in Paragraph, INSTALLERS QUALIFICATIONS.
2. Certify slate will be furnished from single source and each individual slate color shall be furnished from the same color lot.

1.6 WARRANTY

Warranty materials and workmanship are to be free from defects and leaks for two years in accordance with requirements of Article "Warranty of Construction", FAR clause 52.246-21.

1.7 APPLICABLE PUBLICATIONS

A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.

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

C406-06.....Roofing Slate

D226-06.....Asphalt Saturated Organic Felt Used in Roofing and Waterproofing

F1667-05.....Driven Fasteners: Nails, Spikes and Staples

PART 2 - PRODUCTS

2.1 MATERIALS

A. Slate

1. ASTM C406, Grade S-1, unfading having no ribbons exposed to weather.
2. Slate shall be of standard thickness (5/8”) smooth texture. Exposed diamond to be 8.5” All slate shall be hard, dense, sound rock, machine punched for two nails each. All exposed corners shall be practically full. No broken corners on covered ends which sacrifice nailing strength or the laying of a watertight roof are acceptable. No broken or cracked slates shall be used. Two contrasting colors shall be used in the diamond patterns as shown on the Building Elevations. Primary color shall be standard blue-gray with purple for the large diamond pattern and red for the small, center diamond. Diamond sizes shall be uniform.

B. Nails: ASTM F1667: Hard copper slating nails, 25 mm (one inch) longer than thickness of slate.

C. Roofing Felt Underlayment: ASTM D226, Type II, asphalt saturated organic felt, without perforations, nominal 13.6 Kg (30 pounds).

D. Roofers Plastic Cement: As manufactured for the purpose. Color shall match slate.

PART 3 - EXECUTION

3.1 ROOFING FELT UNDERLAYMENT

A. Place felt on a dry, sound deck with four inch end and side laps. Nail at five inch centers on laps. Lap in direction of flow.

B. Extend felt 50 mm (two inches) or more onto sheet metal under slate and cement felt to sheet metal with roofers plastic cement.

3.2 INSTALLING SLATE

A. Lay slate with standard three inch head lap, nail each slate with two nails concealed by the head laps. Slate at eave or cornice line shall be doubled and canted 1/4" by a wooden cant strip.

B. Provide an under eave starter course.

C. Lay all hips in a “Boston” style without metal underlayment

D. Lay all valleys in an open form incorporated metal underlayment.

E. Build in and place metal flashing where detailed on the drawings and as required to provide a watertight installation.

F. Slate overlapping sheet metal work shall have nails placed to avoid puncturing of sheet metal.

G. Nails shall not be overdriven producing strain on the slate. All nails shall be concealed.

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SECTION 07 41 13
CUSTOM METAL ROOFING

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section specifies a custom standing seam and flat lock terne coated stainless steel roofing capable of withstanding structural movement, thermally induced movement, and a complete watertight enclosure. The system includes manufacturer formed standing seam panels and custom formed sheet metal roofing pans, solder, felt and rosin paper.

B. Work of this section includes new coating on existing front porch room.

1.2 RELATED WORK

A. Removal of existing roofing: Section 07 01 50, MAINTENANCE OF ROOFING

B. Sealant: Section 07 92 00, JOINT SEALANTS.

C. Fascia, Trim, Gutters and Downspouts: 07 60 00 FLASHING AND SHEET METAL

1.3 INSTALLATION REQUIREMENTS

A. Install in accordance with SMACNA Architectural Sheet Metal Manual except as otherwise shown or specified.

1.4 APPLICABLE PUBLICATIONS

A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only:

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

A792/A792M-09.....Standard Specifications for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process

B32-08.....Standard Specification for Solder Metal

C920-08.....Standard Specifications for Elastomeric Joint Sealants

D226-06.....Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Weatherproofing

D227-03.....Standard Specification for Coal-Tar-Saturated Organic Felt Used in Roofing and Waterproofing

D4397-09.....Standard Specifications for Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications

E1514-98 (2003).....Standard Specification for Structural Standing Seam Steel Roof Panel Systems

C. Federal Specification (Fed. Spec.):
UU-B-790A INT AMD.....Building Paper, Vegetable Fiber: (Kraft, Waterproof, Water Repellent ad Fire Resistant)

D. Sheet Metal and Air Conditioning Contractors National Association (SMACNA): Architectural Sheet Metal Manual 2003

1.5 SUBMITTALS

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Shop Drawings: Show plan of panel layout and how, if needed, expansion and contraction of material is provided using stationary cleats or expansions cleats. Show direction of roof expansion and contraction. Show details at eave, ridge, hip, valley, rake, cricket, flashings, and penetrations and any special details. Show all cross seams locations and type. Submit sufficient technical data to demonstrate compliance with specific project requirements including fastener, cleat and attachment layout, with load carrying capacity and how the cleat and fastener will hold into the substrate.

C. Product Data: Include product data, general specifications, standard details, and wind uplift test results.

D. Sample: Submit one sample 24″ x 12″ in size illustrating metal roofing mounted on plywood illustrating typical standing seam and flat seam, material and finish.

1.6 QUALITY ASSURANCE

A. Installer must be proven, experienced applicator who has completed several custom projects using SMACNA details. Use adequate number of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and methods needed for proper performance of the work.

1.7 STORAGE AND HANDLING

A. Materials stored must be kept dry. Materials shall be covered and sloped for moisture to drain from the surface.

B. Coil materials must not be exposed to weather and shall be stored in a climate controlled environment.

C. Materials stored on site must be vented to allow condensation to escape.

1.8 WARRANTY

A. Warranty materials and workmanship are to be free from defects and leaks for two years in accordance with requirements of Article "Warranty of Construction", FAR clause 52.246-21.

B. Provide manufacturer’s standard warranty covering product to be free from perforation resulting from corrosion.

PART 2 - PRODUCTS

2.1 METAL ROOF PANEL

A. **ZT ALLOY® Coated Stainless Steel:**
ASTM.240, type 304 stainless steel coated both sides with a minimum alloy (50 Tin/50 Zinc) to a thickness of 20 microns and a mill applied gray pre-weathering.

1. Thickness: 28 gauge, .015” thick, with a weight of 0.67#/sf.

B. Standing Seam Roof Panels: Standing seam system shall be designed for concealed mechanical attachment of roofing panels to substrate.

2.2 ACCESSORIES

A. Cleats: Use manufacturers standard preformed cleats or fabricate from flat stock sheet product to manufacturer’s written specifications.

B. Slip Sheet: Use rosin sized paper as final underlayments under all terne coated stainless steel.

C. Ice & Water Membrane: One layer self-adhered rubberized asphalt high density cross-laminated polyethylene membrane with following characteristics:

1. Thickness: 40 mil (min), ASTM D3767

2. Tensile Strength: 250 psi, ASTM D412

3. Elongation: 250%, ASTM D412

4. Adhesion to plywood: 3.0 lbs/in width, ASTM D903

5. Permeance (max): 0.05 perms, ASTM E96

D. Fasteners: Minimum 7/8" Series 300 stainless steel ring shank nail or equal screw type fastener.

E. Solder: Remove pre-weather wash coat around edges to be soldered with lacquer thinner. To facilitate soldering, it is recommended that the edges of sheets to be joined be pre-tinned. Use pure tin solder with rosin of manufacturer's standard speed flux. Flux residues must be neutralized with soda water and removed. Use soldering irons only. Do not use abrasives in preparing the surface for solder.

F. Panel Coverage: 406 mm (16 inches).

G. Asphalt coating for new porch roof.

2.3 **FABRICATION**

A. Shop fabricate to the maximum extent possible.

1. Custom fabricate all flashings by obtaining field dimensions for accurate fit.
2. Layout so cross seams, when required, will be made in the direction of flow with higher pans overlapping the lower pans. Keep field cutting to a minimum
3. Cross Seams: Provide staggered transverse seams.
4. Provide expansion cleats on standing seam pans 30 feet or more in length.
5. Provide expansion joints as required.
6. Penetrations through the roof are to be fabricated and installed to allow for expansion and contraction of the roof sheet without buckling.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal roof panel supports, and other conditions affecting performance of work.

B. Examine roughing-in for components and systems penetrating metal roof panels to verify actual locations of penetrations relative to seam locations of metal roof panels before metal roof panel installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF ROOFING

A. Install roofing felts lapping a minimum of 4 inches. Apply the specified slip sheet. Prevent moisture from damaging substrate prior to installation of final metal skin.

B. Install roofing sheets and flashings in strict accordance with original design, pertinent regulations of governmental agencies having

jurisdiction, and the recommended installation procedures as approved by the RE/COTR, anchoring all components firmly into position for long life under the anticipated weather conditions. Initially layout and locate all lines and panel terminations. For batten seam roofs, layout all battens accurately onto the substrate prior to installation of the sheets.

C. Install clips to hold sheet into position. Use two fasteners per clip to prevent rotation.

D. Installation performed by qualified trained personnel experienced in the installation of metal roofing and employed by the metal roofing contractor.

E. Installation to have seams and lines as established by the approved shop erection drawings.

F. Metal roofing to be installed per approved drawings with fixed points determined by direction of expansion.

G. Nail cleats a maximum of 12 inches (305 mm) on center; turn tabs over nail or use appropriate stainless steel fasteners.

H. Complete seaming of standing seam panel by automatic seaming machine or other accepted and approved method designed to obtain the proper seam dimension and height.

I. Minimize all exposed fasteners, utilize cleated seams whenever possible.

J. Protect against dissimilar metal contact.

K. Details should be per SMACNA ARCHITECTURAL SHEET METAL MANUAL recommended details.

L. Apply new asphalt coating on front porch roof in accordance with mfr’s written instructions.

3.6 ERECTION TOLERANCES

A. Installation Tolerances: Shim and align metal roof panel units within installed tolerance of 1/4 inch in 20 feet on slope and location lines as indicated and within 1/8 inch offset of adjoining faces and of alignment of matching profiles.

3.7 CLEANING AND PROTECTION

1. Remove and properly dispose of all foreign material and debris from roof and gutters. Be sure no dissimilar metal or other materials are left on roof surface.
2. Clean and neutralize all flux materials.
3. Clean off all excess solder and sealants.

4. Wipe off all hand prints, smudges and other superficial stains that were placed on the custom metal roofing and flashings during fabrication and installation.
5. Remove and replace all dented and damaged materials.
6. Do not permit unnecessary walking on the finished roof. Require all personnel to wear rubber-soled shoes when installing or walking on a finished roof.

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SECTION 07 60 00
FLASHING AND SHEET METAL

PART 1 - GENERAL

1.1 DESCRIPTION

A. Formed sheet metal work for flashing and miscellaneous metal trim, gutters and downspouts are specified in this section.

B. Cutting and patching of existing roofing scheduled to remain as necessary to complete installation of new gutters is work of this section.

1.2 RELATED WORK

A. Section 07 31 26 SLATE SHINGLES

B. Section 07 41 13 CUSTOM METAL ROOFING

C. Sealant compound and installation: Section 07 92 00, JOINT SEALANTS.

1.3 SUBMITTALS

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Shop Drawings:
Flashings
Copings
Gravel Stop-Fascia
Gutters, Conductors & Downspouts

C. Manufacturer's Literature and Data:
Terne coated stainless steel

1.4 APPLICABLE PUBLICATIONS

A. The publications listed below for a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.

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

A167-99-09.....Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip

A653/A653M-08.....Steel Sheet Zinc-Coated (Galvanized) or Zinc Alloy Coated (Galvanized) by the Hot- Dip Process

B32-08.....Solder Metal

D173-03.....Bitumen-Saturated Cotton Fabrics Used in Roofing and Waterproofing

D1187-97 (R2002).....Asphalt Base Emulsions for Use as Protective Coatings for Metal

C. American National Standards Institute/Single Ply Roofing Institute (ANSI/SPRI):
ES-1-2003.....Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems

D. Sheet Metal and Air Conditioning Contractors National Association (SMACNA): Architectural Sheet Metal Manual (2003 Edition).

E. National Association of Architectural Metal Manufacturers (NAAMM):
AMP 500-06.....Metal Finishes Manual

F. American Architectural Manufacturers Association (AAMA):
605-98.....Voluntary Specification for High Performance Organic Coatings on Architectural Extrusions Panels

G. Federal Specification (Fed. Spec):
A-A-1925A.....Shield, Expansion; (Nail Anchors)
UU-B-790A.....Building Paper, Vegetable Fiber

H. International Building Code (IBC):
2009 Edition

PART 2 - PRODUCTS

2.1 MATERIALS

A. **ZT ALLOY® Coated Stainless Steel:**
ASTM.240, type 304 stainless steel coated both sides with a minimum alloy (50 Tin/50 Zinc) to a thickness of 20 microns and a mill applied gray pre-weathering.

B. Solder: ASTM B32; pure tin solder with rosin of manufacturer’s standard speed flux.

B. Stainless Steel: ASTM A167, Type 302B, dead soft temper.

K. Fasteners:
1. Stainless steel of size and shape recommended by the manufacturer for each application, unless specified otherwise.

2.2 SHEET METAL THICKNESS

A. Except as otherwise shown or specified use thickness or weight of sheet metal as follows:
1. Terne Coated Stainless steel: 24 gauge with a weight of 1.02#/sf

2.3 FABRICATION, GENERAL

A. General: Fabricate sheet metal flashing and trim to comply with SMACNA guidelines.

B. Joints:

1. Form nonexpansion, but moveable in metal to accommodate sealant to comply with SMACNA guidelines.
2. Conceal all fasteners where possible.

C. Flat and lap joints shall be made in direction of flow.

E. Soldering:

1. Comply with ASTM B32. Remove pre-weather wash coat around edges to be soldered with lacquer thinner. To facilitate soldering, it is recommended that the edges of sheets to be joined be pre-tinned. Use pure tin solder with rosin of manufacturer’s standard speed flux. Flux residues must be neutralized with soda water and removed. Use soldering irons only. Do not use abrasives in preparing the surface for solder.

F. Expansion and Contraction Joints:

1. Fabricate in accordance with the Architectural Sheet Metal Manual recommendations.

G. Cleats:

1. Fabricate cleats, metal edges, drips, edge strips, and attachment devices from the same material as accessory being anchored.

2.4 FINISH

A. Use same finish on adjacent metal or components and exposed metal surfaces unless specified or shown otherwise.

2.6 COUNTERFLASHING

A. Terne coated stainless steel.

B. Comply with SMACNA guidelines for installation tolerances.

C. Fabricate to lap base flashing a minimum of 100 mm (4 inches) with drip.

D. One-piece Counterflashing:

1. Upper edge formed to extend 1″ into brick bed joint.

2.7 HANGING GUTTERS

A. Fabricate gutters to cross-section indicated, complete with end caps, outlet tubes, and other accessories as required.

B. Fabricate hanging gutters in continuous full length sections between expansion joints.

C. Gutter Spacers:

1. Furnish flat stock gutter spacers and brackets from the same material as gutters, and of size recommended by SMACNA.

2.8 ACCESSORIES

A. Ice & Water Membrane: One layer self-adhered rubberized asphalt high density cross-laminated polyethylene membrane with following characteristics:

1. Thickness: 40 mil (min), ASTM D3767

2. Tensile Strength: 250 psi, ASTM D412

3. Elongation: 250%, ASTM D412

4. Adhesion to plywood: 3.0 lbs/in width, ASTM D903

5. Permeance (max): 0.05 perms, ASTM E96

PART 3 - EXECUTION

3.1 INSTALLATION

A. General:

1. Anchor sheet metal flashing and trim and other components of the work securely in place with provisions for thermal and structural movement. Use fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required to complete flashing and trim assemblies.
2. 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.
3. Solder all joints and seams except where SMACNA details call for sealant. Apply Sealant as specified in Section 07 92 00, JOINT SEALANTS.
4. Apply sheet metal and other flashing material to surfaces which are smooth, sound, clean, dry and free from defects that might affect the application.
5. 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 6 mm (1/4 inch) with sheet metal compatible with the roofing and flashing material used.
6. 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.

7. Confine direct nailing of sheet metal to strips 300 mm (12 inch) or less wide. Nail flashing along one edge only. Space nails not over 100 mm (4 inches) on center unless specified otherwise.
8. Install bolts, rivets, and screws where indicated, specified, or required in accordance with the SMACNA Sheet Metal Manual. Space rivets at 75 mm (3 inch) on centers in two rows in a staggered position. Use neoprene washers under fastener heads when fastener head is exposed.
9. Coordinate with roofing work for the installation of metal base flashings and other metal items having roof flanges for anchorage and watertight installation.
10. Nail continuous cleats on 75 mm (3 inch) centers in two rows in a staggered position.
11. Nail individual cleats with two nails and bend end tab over nail heads. Lock other end of cleat into hemmed edge.
12. Install flashings in conjunction with other trades so that flashings are inserted in other materials and joined together to provide a water tight installation.
13. Where required to prevent galvanic action between dissimilar metal isolate the contact areas of dissimilar metal with sheet lead, waterproof building paper, or a coat of bituminous paint.
14. Isolate aluminum in contact with dissimilar metals others than stainless steel, white bronze or other metal compatible with aluminum by:
    a. Paint dissimilar metal with a prime coat of zinc-chromate or other suitable primer, followed by two coats of aluminum paint.
    b. Paint dissimilar metal with a coat of bituminous paint.
    c. Apply an approved caulking material between aluminum and dissimilar metal.
15. Bitumen Stops:
    a. Install bitumen stops for built-up roof opening penetrations through deck and at formed sheet metal gravel stops.
    b. Nail leg of bitumen stop at 300 mm (12 inch) intervals to nailing strip at roof edge before roofing material is installed.

3.3 COUNTERFLASHING

A. General:

1. Install counterflashing over and in conjunction with installation of base flashings, except as otherwise specified or shown.

2. Install counterflashing to lap base flashings not less than 100 mm (4 inch).
3. Install upper edge or top of counterflashing not less than 225 mm (9 inch) above top of the roofing.
4. Lap joints not less than 100 mm (4 inch). Stagger joints with relation to metal base flashing joints.
5. Use surface applied counterflashing on existing surfaces and new work where not possible to integrate into item.
6. When fastening to masonry, use screws driven in expansion shields set in masonry. Use screws to wood and sheet metal. Set fasteners in mortar joints of masonry work.

B. One Piece Counterflashing:
1. Where flashing is installed at new masonry, coordinate to insure proper height, embed in mortar, and end lap.
2. Where flashing is installed in reglet in concrete insert upper edge into reglet. Hold flashing in place with lead wedges spaced not more than 200 mm (8 inch) apart. Fill joint with sealant.
3. Where flashing is surface mounted on flat surfaces.
   a. When top edge is double folded anchor flat portion below sealant "V" joint with fasteners spaced not over 400 mm (16 inch) on center:
      1) Locate fasteners in masonry mortar joints.
      2) Use screws to sheet metal or wood.
   b. Fill joint at top with sealant.
4. Where flashing or hood is mounted on pipe.
   a. Secure with draw band tight against pipe.
   b. Set hood and secure to pipe with a one by 25 mm x 3 mm (1 x 1/8 inch) bolt on stainless steel draw band type clamp, or a stainless worm gear type clamp.
   c. Completely fill joint at top with sealant.

3.5 HANGING GUTTERS

A. Hang gutters with high points equidistant from downspouts. Slope at not less than 1:200 (1/16 inch per foot).
B. Lap joints, except for expansion joints, at least 25 mm (one inch) in the direction of flow. Rivet and seal or solder lapped joints.
C. Support gutters in brackets spaced not more than 600 mm (24 inch) on centers, brackets attached to facial or wood nailer by at least two screws or nails.

1. For stainless steel gutters use stainless steel brackets.
2. Use brass or stainless steel screws.

D. Secure brackets to gutters in such a manner as to allow free movement of gutter due to expansion and contraction.

E. Gutter Expansion Joint:
1. Locate expansion joints midway between outlet tubes.
2. Provide at least a 25 mm (one inch) expansion joint space between end baffles of gutters.
3. Install a cover plate over the space at expansion joint.
4. Fasten cover plates to gutter section on one side of expansion joint only.
5. Secure loose end of cover plate to gutter section on other side of expansion joint by a loose-locked slip joint.

F. Outlet Tubes: Set bracket strainers loosely into gutter outlet tubes.

G. Connect downspouts to underground storm sewer system where specified. Seal connection watertight.

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SECTION 07 92 00
JOINT SEALANTS

PART 1 - GENERAL

1.1 DESCRIPTION:

A. Section covers all sealant and caulking materials and their application, wherever required for complete installation of building materials or systems and in all locations where two different materials join one another unless otherwise specified.

1.2 RELATED WORK:

A. Glazing: Section 08 80 00, GLAZING.

1.3 QUALITY CONTROL:

A. Installer Qualifications: An experienced installer 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.

B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

C. VOC: Acrylic latex and Silicon sealants shall have less than 50g/l VOC content.

1.4 SUBMITTALS:

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Manufacturer's installation instructions for each product used.

C. Manufacturer's Literature and Data:

1. Caulking compound
2. Primers
3. Sealing compound, each type, including compatibility when different sealants are in contact with each other.

1.5 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 4.4 °C (40 °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.

1.6 DELIVERY, HANDLING, AND STORAGE:

A. Deliver materials in manufacturers' original unopened containers, with brand names, date of manufacture, shelf life, and material designation clearly marked thereon.

B. Carefully handle and store to prevent inclusion of foreign materials.

C. Do not subject to sustained temperatures less than 5° C (40° F) or exceeding 32° C (90° F).

1.7 DEFINITIONS:

A. Definitions of terms in accordance with ASTM C717 and as specified.

B. Back-up Rod: A type of sealant backing.

C. Bond Breakers: A type of sealant backing.

D. Filler: A sealant backing used behind a back-up rod.

1.8 WARRANTY:

A. Warranty exterior sealing against leaks, adhesion, and cohesive failure, and subject to terms of "Warranty of Construction", FAR clause 52.246-21, except that warranty period shall be extended to two years.

B. General Warranty: Special warranty specified in this Article shall not deprive Government of other rights Government may have under other provisions of Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of Contract Documents.

1.9 SEQUENCING

A. Schedule caulking to complete in advance of painting. All interior caulk shall be painted to match the adjacent painted surface.

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. American Society for Testing and Materials (ASTM):

C509-06.....Elastomeric Cellular Preformed Gasket and Sealing Material.

C612-04.....Mineral Fiber Block and Board Thermal Insulation.

C717-09.....Standard Terminology of Building Seals and Sealants.

C834-05.....Latex Sealants.

C919-08.....Use of Sealants in Acoustical Applications.

C920-08.....Elastomeric Joint Sealants.

C1021-08.....Laboratories Engaged in Testing of Building Sealants.

C1193-09.....Standard Guide for Use of Joint Sealants.

C1330-02 (R2007).....Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants.

D1056-07.....Specification for Flexible Cellular Materials—Sponge or Expanded Rubber.

E84-09.....Surface Burning Characteristics of Building Materials.

C. Sealant, Waterproofing and Restoration Institute (SWRI).
The Professionals' Guide

PART 2 - PRODUCTS

2.1 SEALANTS:

A. S-1 (General Exterior):
1. ASTM C920, 2 component polyurethane .
2. Type M.
3. Class 25.
4. Grade NS.
5. Shore A hardness of 20-40

B. S-2 (Exterior Flashings):
1. ASTM C920, silicone neutral cure
2. Type S.
3. Class Joint movement range of plus 100 percent to minus 50 percent
4. Grade NS.
5. Shore A hardness of 15-20
6. Minimum elongation of 1200 percent.

2.2 CAULKING COMPOUND:

A. C-1: ASTM C834, acrylic emulsion latex, paintable.

2.3 COLOR:

A. Sealants used with exposed masonry shall match color of mortar joints.

B. Color of sealants for other locations shall be light gray or aluminum, unless specified otherwise.

C. Caulking shall be light gray or white, unless specified otherwise.

2.4 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 indicated below and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance:

1. Type C: Closed-cell material with a surface skin.

C. Elastomeric Tubing Sealant Backings: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D1056, nonabsorbent to water and gas, and capable of remaining resilient at temperatures down to minus 32° C (minus 26° 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.

2.5 FILLER:

A. Mineral fiber board: 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 POUROUS SURFACES:

Chemical cleaners acceptable to manufacturer of sealants and sealant backing material, 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.

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 the following:

a. Concrete.

b. Masonry.

c. Unglazed surfaces of ceramic tile.

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.

a. Metal.

b. Glass.

c. Porcelain enamel.

d. Glazed surfaces of ceramic tile.

C. Do not cut or damage joint edges.

D. Apply 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.
   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.
F. Take all necessary steps to prevent three sided adhesion of sealants.

3.3 BACKING INSTALLATION:

A. Install back-up 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 back-up rod and position the rod at proper depth.
C. Cut fillers installed by others to proper depth for installation of back-up rod and sealants.
D. Install back-up rod, without puncturing the material, to a uniform depth, within plus or minus 3 mm (1/8 inch) for sealant depths specified.
E. Where space for back-up rod does not exist, install bond breaker tape strip at bottom (or back) of joint so sealant bonds only to two opposing surfaces.
F. Take all necessary steps to prevent three sided adhesion of sealants.

3.4 SEALANT DEPTHS AND GEOMETRY:

A. At widths up to 6 mm (1/4 inch), sealant depth equal to width.
B. At widths over 6 mm (1/4 inch), sealant depth 1/2 of width up to 13 mm (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. Comply with manufacturer’s written installation instructions for products and applications indicated.
B. For application of sealants, follow requirements of ASTM C1193 unless specified otherwise.
C. Where gypsum board partitions are of sound rated, fire rated, or smoke barrier construction, follow requirements of ASTM C919 only to seal all cut-outs and intersections with the adjoining construction unless specified otherwise.

1. Apply a 6 mm (1/4 inch) minimum bead of sealant each side of runners (tracks), including those used at partition intersections with dissimilar wall construction.
2. Coordinate with application of gypsum board to install sealant immediately prior to application of gypsum board.
3. Partition intersections: Seal edges of face layer of gypsum board abutting intersecting partitions, before taping and finishing or application of veneer plaster-joint reinforcing.
4. Openings: Apply a 6 mm (1/4 inch) bead of sealant around all cut-outs to seal openings of electrical boxes, ducts, pipes and similar penetrations. To seal electrical boxes, seal sides and backs.
5. Control Joints: Before control joints are installed, apply sealant in back of control joint to reduce flanking path for sound through control joint.

3.6 CLEANING:

A. Fresh compound accidentally smeared on adjoining surfaces: Scrape off immediately and rub clean with a solvent as recommended by the caulking or sealant manufacturer.

B. After filling and finishing joints, remove masking tape.

C. Leave adjacent surfaces in a clean and unstained condition.

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SECTION 08 14 00
WOOD DOORS

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section specifies interior, exterior, and storm stile and rail wood doors.

1.2 RELATED WORK

A. Door hardware including hardware location (height): Section 08 71 00, DOOR HARDWARE.

B. Installation of doors and hardware: Section 08 71 00, DOOR HARDWARE.

1.3 SUBMITTALS

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Shop Drawings:

1. Show every door in project and schedule location in building.
2. Indicate type, grade, finish and size; include detail of wood paneling and pertinent details.
3. Provide information concerning specific requirements not included in the manufacturer's literature and data submittal.

C. Laboratory Test Reports:

1. Screw holding capacity test report in accordance with WDMA T.M.10.
2. Split resistance test report in accordance with WDMA T.M.5.
3. Cycle/Slam test report in accordance with WDMA T.M.7.
4. Hinge-Loading test report in accordance with WDMA T.M.8.

1.4 WARRANTY

A. Doors are subject to terms of Article titled “Warranty of Construction”, FAR clause 52.246-21, except that warranty shall be as follows:

1. For interior doors, manufacturer’s warranty for lifetime of original installation.

1.5 DELIVERY AND STORAGE

A. Factory seal doors and accessories in minimum of 6 mill polyethylene bags or cardboard packages which shall remain unbroken during delivery and storage.

B. Store in accordance with WDMA I.S.1-A, J-1 Job Site Information.

C. Label package for door opening where used.

1.6 APPLICABLE PUBLICATIONS

Publications listed below form a part of this specification to extent referenced. Publications are referenced in text by basic designation only.

B. Window and Door Manufacturers Association (WDMA):

I.S.4-09.....Water-Repellent Preservative Non-Pressure Treatment for Millwork

I.S.6A-08.....Architectural Wood Stile and Rail Doors

T.M.5-90(2009).....Split Resistance Test Method

T.M.6-08.....Adhesive (Glue Bond) Durability Test Method

T.M.7-08.....Cycle-Slam Test Method

T.M.8-08.....Hinge Loading Test Method

T.M.10-08.....Screwholding Test Method

PART 2 - PRODUCTS

2.2 STILE AND RAIL DOORS

A. Meeting requirements of WDMA I.S.6A

B. Ponderosa pine doors of size and design shown.

C. Grade: Standard.

D. Door Panels:

1. Grain of face of panels parallel with longest dimensions of panel.
2. Raised panels: Unless otherwise shown, thickness of raised panels not less than the following:
   a. For 35 mm (1-3/8 inch) and 45 mm (1-3/4 inch) thick doors: 28 mm (1-1/8 inch) thick
3. Where armor plate is required in connection with paneled doors, provide panels with plywood fillers, glued in place, and finished.

E. Stops and Molds:

1. Solid sticking both sides, of same material as stiles and rails, coped at intersections.
2. Glazed openings applied wood stops nailed on interior side of door.

F. Dutch Doors:

1. Consist of two sections, each fabricated as specified for stile and rail doors.
2. Construct shelf as detailed, from clear hardwood stock same species as door.
3. Place shelf on top of lower section of door and support with a pair of wood.

2.4 IDENTIFICATION MARK:

A. On top edge of door.

B. Either a stamp, brand or other indelible mark, giving manufacturer's name, door's trade name, construction of door, code date of manufacture and quality.

C. Accompanied by either of the following additional requirements:

1. An identification mark or a separate certification including name of inspection organization.
2. Identification of standards for door, including glue type.
3. Identification of veneer and quality certification.
4. Identification of preservative treatment for stile and rail doors.

2.5 SEALING:

Give top and bottom edge of doors two coats of catalyzed polyurethane or water resistant sealer before sealing in shipping containers.

PART 3 - EXECUTION

3.1 DOOR PREPARATION

A. Prepare doors in shop for specified hardware. Coordinate with work of Section 08 71 00 DOOR HARDWARE

B. Clearances between Doors and Frames and Floors:

1. Maximum 3 mm (1/8 inch) clearance at the jambs, heads, and meeting stiles, and a 19 mm (3/4 inch) clearance at bottom, except as otherwise specified.

C. Provide cutouts for special details required and specified.

D. Rout doors for hardware using templates and location heights specified in Section, 08 71 00 DOOR HARDWARE.

E. Fit doors to frame, bevel lock edge of doors 3 mm (1/8 inch) for each 50 mm (two inches) of door thickness // undercut where shown. //

F. Immediately after fitting and cutting of doors for hardware, seal cut edges of doors with two coats of water resistant sealer.

G. Finish surfaces, including both faces, top and bottom and edges of the doors smooth to touch.

3.2 INSTALLATION OF DOORS APPLICATION OF HARDWARE

A. Install units in accordance with manufacturer's installation instructions.

B. Install doors and frames plumb, level and square.

C. Anchor door frames securely.

D. Coordinate installation of hardware specified in Section 08710.

E. Set thresholds in bed of mastic and backseal.

F. Install doors to be weathertight in closed position.

G. Repair minor damages to finish in accordance with manufacturer's instructions and as approved by Architect.

H. Remove and replace damaged components that cannot be successfully repaired as determined by Architect.

3.3 DOOR PROTECTION

A. As door installation is completed, place polyethylene bag or cardboard shipping container over door and tape in place.

B. Provide protective covering over knobs and handles in addition to covering door.

C. Maintain covering in good condition until removal is approved by Resident Engineer.

3.3 SCHEDULE

A. Refer to Door Schedule on sheet A-1. Provide exterior 1 3/4″ raised panel wood doors, 1 3/8″ wood storm door, and interior 1 3/4″ raised panel dutch door.

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SECTION 08 51 13
ALUMINUM CLAD WINDOWS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Aluminum clad wood casement windows of size shown on drawings, complete with hardware, related components and accessories.

B. Wood framed storm windows in sizes and configuration shown on drawings complete with hardware and installation accessories.

1.2 DEFINITIONS

A. Accessories: Mullions, staff beads, casings, closures, trim, moldings, clips anchors, fasteners, weather-stripping, hardware and other necessary components required for fabrication and installation of window units.

B. Uncontrolled Water: Water not drained to the exterior, or water appearing on the room side of the window.

1.3 RELATED WORK

A. Color of finish: Section 09 06 00, SCHEDULE FOR FINISHES.

B. Interior paint finish: Section 09 91 00, PAINTING AND SPECIAL COATING

1.4 FIELD SERVICES

A. Prior to preparation of bid all interested bidders shall visit the site and perform an inspection of existing conditions. Bids shall include all costs associated with material, labor and equipment necessary for any additional trim, window leg extensions, window jamb extensions, or other miscellaneous item required to complete the work. No additional compensation will be made for additional window accessories required to complete the work.

1.5 DELIVERY, STORAGE AND HANDLING

A. Protect windows from damage during handling and construction operations before, during and after installation.

B. Store windows under cover, setting upright.

C. Do not stack windows flat.

D. Do not lay building materials or equipment on windows.

1.6 QUALITY ASSURANCE

A. Approval by contracting officer is required of products or service of proposed manufacturers and installers.

B. Approval will be based on submission of certification by Contractor that:

1. Manufacturer regularly and presently manufactures the specified windows as one of its principal products.
2. Installer has technical qualifications, experience, trained personnel and facilities to install specified items.

C. Provide each type of window produced (aluminum clad and wood storm windows) from one source of manufacture.

D. Quality Certified Labels or certificate:

1. Certificates of recent test report (not more than 4 years old) from an independent testing laboratory and certificate signed by window manufacturer stating that windows provided comply with specified requirements.

1.7 SYSTEM DESCRIPTION

A. Design and Performance Requirements:

1. Window units shall be designed to comply with AAMA 2605
2. Air leakage shall not exceed the following when tested at 1.57 psf according to ASTM E 283: 0.30 cfm per square foot of frame.
3. No water penetration when tested at the following pressure according to ASTM E 547: 7.5 psf.
4. Assembly shall withstand a positive or negative uniform static air pressure difference of 75 psf without damage when tested according to ASTM E 330.

1.8 SUBMITTAL

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Shop Drawings:

1. Minimum of 1/2 full scale for each type of windows on project.
2. Identifying parts of window units by name and kind of metal or material, show construction, locking systems, mechanical operators, trim, installation and anchorages.
3. Include glazing details and standards for factory glazed units.

C. Manufacturer's Literature and Data:

Window.

Sash locks, and keepers.

D. Certificates:

1. Certificates as specified in paragraph QUALITY ASSURANCE.
2. Indicating manufacturers and installers qualifications.
3. Manufacturer's Certification that windows delivered to project are identical to windows tested.

E. Test Reports:
Copies of test reports as specified in paragraph QUALITY ASSURANCE.

F. Samples: Provide 150 mm (six-inch) length samples showing finishes, specified.

1.9 WARRANTY

A. Warrant windows against malfunctions due to defects in thermal breaks, hardware, materials and workmanship, subject to the terms of Article “WARRANTY OF CONSTRUCTION”, FAR clause 52.246-21, except provide 10 year warranty period.

B. Insulating glass shall be warranted against visible obstruction through the glass caused by a failure of the insulating glass air seal for a period of twenty (20) years from the date of original purchase.

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. American Society for Testing and Materials (ASTM):
1. E 283: Standard Test Method for Rate of Air Leakage through Exterior Windows, Curtain Walls, and Doors.
2. E 330: Standard Test Method for Structural Performance of Exterior Windows, Curtains Walls, and Doors by Uniform Static Air Pressure Difference.
3. E 547: Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Cyclic Static Air Pressure Differential.
4. E 2190: Specification for Sealed Insulated Glass Units.
5. C 1036: Standard Specification for Flat Glass.

C. WDMA I.S.4: Industry Standard for Water Repellent Preservative Treatment for Millwork.

D. American Architectural Manufactures Association / Window and Door Manufactures Association (AAMA / WDMA): ANSI / AAMA / NWWDA 101 / I.S.2-97 Voluntary Specifications for Aluminum, Vinyl (PVC) and Wood Windows and Glass Doors. and 101 / I.S.2 / NAFS-02 Voluntary Performance Specification for Windows, Skylights and Glass Doors, AAMA / WDMA/CSA 101 / I.S.2 / A440-05 Standard / Specification for Windows, Doors and Unit Skylight.

E. Window and Door Manufacturers Association (WMDA): 101 / I.S.2 WDMA Hallmark Certification Program.

F. Sealed Insulating Glass Manufactures Association / Insulating Glass Certification Council (SIGMA / IGCC).
G. American Architectural Manufacturers Association (AAMA): 2605: Voluntary Specification for High Performance Organic Coatings on Architectural Extrusions and Panels.
H. National Fenestration Rating Council (NFRC): 101: Procedure for Determining Fenestration Product Thermal Properties.

PART 2- PRODUCTS

2.1 MATERIALS

A. Description: Factory assembled clad replacement casement, simulated divided lites and spacers as dimensioned on the drawings and operating exterior swing out window.

2.2 FRAME DESCRIPTION

A. Interior: Clear pine or finger jointed core with clear pine veneer
   1. Kiln dried to moisture content no greater than twelve (12)percent at the time of fabrication.
   2. Water repellent preservative treated in accordance with WDMA I.S.4.
B. Frame thickness: 1 3/16 inches
C. Frame Depth: Overall 3 1/4inch jambs for replacement applications.
D. Frame Bevel: none
E. Frame exterior clad with 0.050 inch thick extruded aluminum.

2.3 SASH DESCRIPTION

A. Clear pine
   1. Kiln dried to moisture content no greater than twelve (12)percent at the time of fabrication.
   2. Water repellent preservative treated in accordance with WDMA I.S.4.
B. Sash thickness: 1 5/8 inches
C. Frame exterior clad with 0.050 inch thick extruded aluminum.

2.4 GLAZING

A. Select quality complying with ASTM C 1036. Insulating glass SIGMA / IGCC certified to performance level CBA when tested in accordance with ASTM E 2190.
B. Glazing method: Insulated glass.
C. Glass type: Clear, LoE^2 272® with Argon.
D. Glazing seal: Silicone bedding at interior and exterior.

2.5 FINISH

A. Exterior: Aluminum clad. Fluoropolymer modified acrylic topcoat applied over primer. Meets or exceeds AAMA 2605 requirements.

1. Standard Color: Stone White

B. Interior: Latex prime coat, white.

2.6 HARDWARE

A. Factory installed operating hardware: Hinges: One at the sill to bottom rail, one at the head jamb to top rail. Hinges shall be steel coated. Hinge track shall be stainless steel. Hinges shall be equipped with adjustable friction limiter device to hold sash in place when opened, plus a feature that locks the sash open at multiple locations.

B. LOCKS: A multi-point lock system with an Oil Rubbed Bronze single lock actuator. The lock on the primary sash locks into the head jamb, sill and into the jamb or style of the secondary sash. The lock on the secondary sash activates bolts that go into the head jamb and sill

C. Handle/Lock finish: Satin Nickel.

2.7 WEATHER STRIP

A. Hollow foamed material bent around 90 degree corner to allow for seamless corner joints beige in color at frame. Sash weather strip shall be white bulb shaped glass filled material.

2.8 JAMB EXTENSION

A. Provide jamb extensions are required to accommodate existing conditions, refer to drawings.

2.9 SIMULATED DIVIDED LITES (SDL)

A. 5/8 inch wide (horizontal) and 1 3/4” wide (vertical) with internal spacer bars.

1. Exterior muntins: 0.055 inch (1.4 mm) thick extruded aluminum.
2. Interior muntins: Pine. Muntins adhered to glass with closed-cell copolymer acrylic foam tape.
3. Pattern: Rectangular; Custom lite layout as indicated on the drawings.
4. Finish: Match sash finish.

2.10 ACCESSORIES

A. Factory installed vinyl nailing fin/drip cap.

B. Installation brackets: size as appropriate

PART 3 - EXECUTION

3.1 PROTECTION (DISSIMILAR MATERIALS)

AAMA 101/I.S.2.

3.2 INSTALLATION, GENERAL

A. Install window units in accordance with manufacturer's specifications and recommendations for installation of window units, hardware, operators and other components of work.

B. Set windows plumb, level, true, and in alignment; without warp or rack of frames or sash.

C. Replacement Windows:

1. Do not remove existing windows until new replacement is available, ready for immediate installation.
2. Remove existing work carefully; avoid damage to existing work to remain.
3. Perform all other operations as necessary to prepare openings for proper installation and operation of new units.
4. Do not leave openings uncovered at end of working day.

3.3 ADJUST AND CLEAN

A. Clean surfaces promptly after installation of windows, exercising care to avoid damage to protective coatings and finishes.

B. Remove excess sealant compounds, dirt, and other substances.

C. Clean glass promptly after installation of windows. Remove glazing and sealant compound, dirt and other substances.

D. Except when a window is being adjusted or tested, keep locked in the closed position during the progress of work on the project.

3.4 SCHEDULE

A. Refer to Window Schedule on sheet A-2. Provide Type F casement windows at all locations shown on the second floor plan.

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SECTION 08 71 00
DOOR HARDWARE

PART 1 - GENERAL

1.1 DESCRIPTION

A. Door hardware and related items necessary for complete installation and operation of doors.

1.2 RELATED WORK

A. Caulking: Section 07 92 00 JOINT SEALANTS.

B. Application of Hardware: Section 08 14 00, WOOD DOORS

C. Painting: Section 09 91 00, PAINTING.

1.3 GENERAL

A. All hardware shall comply with UFAS, (Uniform Federal Accessible Standards) unless specified otherwise.

B. Hardware for application on metal and wood doors and frames shall be made to standard templates. Furnish templates to the fabricator of these items in sufficient time so as not to delay the construction.

C. The following items shall be of the same manufacturer, if possible, except as otherwise specified:

1. Mortise locksets.
2. Hinges for wood doors.

1.4 SUBMITTALS

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES.

B. Hardware Schedule: Prepare and submit hardware schedule in the following form:

Hardware Item	Quantity	Size	Reference Publication Type No.	Finish	Mfr. Name and Catalog No.	Key Control Symbols	UL Mark (if fire rated and listed)	ANSI/BHMA Finish Designation

C. Samples and Manufacturers' Literature: Submit manufacturer’s product literature and installation instructions for each hardware item specified.

D. Certificate of Compliance and Test Reports: Submit certificates that hardware conforms to the requirements specified herein. Certificates shall be accompanied by copies of reports as referenced. The testing shall have been conducted either in the manufacturer's plant and certified by an independent testing laboratory or conducted in an independent laboratory, within four years of submittal of reports for approval.

1.5 DELIVERY AND MARKING

Deliver items of hardware to job site in their original containers, complete with necessary appurtenances including screws, keys, and instructions. Tag one of each different item of hardware and deliver to RE/COTR for reference purposes. Tag shall identify items by Project Specification number and manufacturer's catalog number. These items shall remain on file in RE/COTR's office until all other similar items have been installed in project, at which time the RE/COTR will deliver items on file to Contractor for installation in predetermined locations on the project.

1.6 INSTRUCTIONS

A. Manufacturers' Catalog Number References: Where manufacturers' products are specified herein, products of other manufacturers which are considered equivalent to those specified may be used. Manufacturers whose products are specified are identified by abbreviations as follows:

SC	Schlage	Indianapolis, IN
NA	National Guard Products	Memphis, TN
Hager	Hager Hinge Company	Saint Louis, MO
RX	Rixson	Franklin Park, IL

B. Keying: A new Great Grandmaster key shall be established for this project. The key system shall be removable core type. The manufacturer shall furnish code pattern listings so keys may be reproduced by code. The manufacturer shall design the new key system with the capacity to relock the existing station and also provide for 25 percent expansion capability beyond this requirement. Submit a keying chart for approval showing proposed keying layout and listing expansion capacity.

1. All permanent cores shall be furnished by Owner and installed by the Contractor.
2. Contractor shall provided keyed construction cores.

1.7 APPLICABLE PUBLICATIONS

A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only. In text, hardware items are referred to by series, types, etc., listed in such specifications and standards, except as otherwise specified.

B. American National Standards Institute/Builders Hardware Manufacturers Association (ANSI/BHMA):

A156.1-06.....Butts and Hinges
A156.2-03.....Bored and Pre-assembled Locks and Latches
A156.5-01.....Auxiliary Locks and Associated Products
A156.6-06.....Architectural Door Trim
A156.8-05.....Door Controls-Overhead Stops and Holders
A156.13-05.....Mortise Locks and Latches
A156.16-02.....American National Standard for Auxiliary Hardware
A156.18-06.....Materials and Finishes
A156.21-06.....Thresholds
A156.22-05.....Door Gasketing and Edge Seal Systems
A250.8-03.....Standard Steel Doors and Frames

C. National Fire Protection Association (NFPA):

80-07.....Fire Doors and Fire Windows
101-09.....Life Safety Code

D. Underwriters Laboratories, Inc. (UL):

BUILDING MATERIALS DIRECTORY (2009)

PART 2 - PRODUCTS

2.1 BUTT HINGES

A. ANSI A156.1. The following types of butt hinges shall be used for the types of doors listed, except where otherwise specified:

1. Exterior Doors: Type A2112 for doors 900 mm (3 feet) wide or less and Type A2111 for doors over 900 mm (3 feet) wide. Hinges for exterior doors shall have non-removable pins.
2. Interior Doors: Type 8112 for doors 900 mm (3 feet) wide or less and Type A8111 for doors over 900 mm (3 feet) wide.

2.2 DOOR STOPS

A. Conform to ANSI A156.16.

B. Provide door stops wherever an opened door or any item of hardware thereon would strike a wall, column, equipment or other parts of building construction. For concrete or masonry construction, use lead expansion shields for mounting door stops.

C. Where cylindrical locks with turn pieces or pushbuttons occur, equip wall bumpers Type L02251 (rubber pads having concave face) to receive turn piece or button.

D. Substitute floor stops Type L02141 or L02161 as appropriate, when wall bumpers would not provide an effective door stop.

E. Provide stop Type L02011 or L02181, as applicable for exterior doors.

F. Provide appropriate roller bumper for each set of doors (except where closet doors occur) where two doors would interfere with each other in swinging.

2.3 LOCKS AND LATCHES

A. Conform to ANSI A156.2. Locks and latches for doors 45 mm (1-3/4 inch) thick or over shall have beveled fronts. Lock cylinders shall have not less than 7 pins. Cylinders for all locksets shall be removable core type. Cylinders shall be furnished with construction removable cores and construction master keys. Cylinder shall be removable by special key or tool. Construct all cores so that they will be interchangeable into the core housings of all mortise locks, rim locks, cylindrical locks, and any other type lock included in the Great Grand Master Key System. Disassembly of lever or lockset shall not be required to remove core from lockset. Provide temporary keying device or construction core of allow opening and closing during construction and prior to the installation of final cores.

B. In addition to above requirements, locks and latches shall comply with following requirements:

1. Mortise Lock and Latch Sets: Conform to ANSI/BHMA A156.13. Mortise locksets shall be series 1000, minimum Grade 2. All locksets and latchsets shall have lever handles similar to Falcon S-lever Design. Lever handle shall be fabricated from wrought stainless steel. No substitute lever design or material shall be accepted. All locks and latchsets shall be furnished with curved lip strike and wrought box. Lock function F02 shall be furnished with key plates similar to Russwin's No. A70.

2. Cylindrical Lock and Latch Sets: levers shall meet ADA (Americans with Disabilities Act) requirements. Cylindrical locksets shall be

series 4000 Grade I. Knobs for series 4000 lock and latch sets shall have 57 mm (2-1/4 inch) diameters.

3. Auxiliary locks shall be as specified under hardware sets and conform to ANSI A156.5.

2.4 KEYS

A. Stamp all keys with change number and key set symbol. Furnish keys in quantities as follows:

Locks/Keys	**Quantity**
Cylinder locks	2 keys each
Cylinder lock change key blanks	10 each different key way
Master-keyed sets	6 keys each
Grand Master sets	6 keys each
Great Grand Master set	5 keys
Control key	1 key

2.5 ARMOR PLATES, COMBINATION KICK-MOP PLATES AND DOOR EDGING

A. Conform to ANSI Standard A156.6.

B. Provide protective plates as specified in the hardware schedule.

2.6 THRESHOLDS

A. Conform to ANSI A156.21, mill finish extruded aluminum, except as otherwise specified. In existing construction, thresholds shall be installed in a bed of sealant with machine screws and expansion shields. In new construction, embed aluminum anchors coated with epoxy in concrete to secure thresholds. Furnish thresholds for the full width of the openings.

2.7 WEATHERSTRIPS (FOR EXTERIOR DOORS)

Conform to ANSI A156.22. Air leakage shall not to exceed 0.50 CFM per foot of crack length (0.000774m^3/s/m).

2.8 FINISHES

A. Exposed surfaces of hardware shall have ANSI A156.18, finishes as specified.

2.9 BASE METALS

Apply specified U.S. Standard finishes on different base metals as following:

Finish	**Base Metal**
652	Steel
626	Brass or bronze

630	Stainless steel

PART 3 - EXECUTION

3.1 HARDWARE HEIGHTS

A. For existing buildings locate hardware on doors at heights to match existing hardware. The Contractor shall visit the site, verify location of existing hardware and submit locations to RE/COTR for approval.

3.2 INSTALLATION

A. Hinge leaves shall be sufficiently wide to allow doors to swing clear of door frame trim.

B. Where new hinges are specified for new doors in existing frames or existing doors in new frames, sizes of new hinges shall match sizes of existing hinges.

C. Fastenings: Suitable size and type and shall harmonize with hardware as to material and finish. Provide machine screws and lead expansion shields to secure hardware to concrete or solid masonry. Fiber or rawl plugs and adhesives are not permitted. All fastenings exposed to weather shall be of nonferrous metal.

D. After locks have been installed; show in presence of RE/COTR that keys operate their respective locks in accordance with keying requirements. (All keys, Master Key level and above shall be sent Registered Mail to the Cementary Director along with the bitting list. Also a copy of the invoice shall be sent to the RE/COTR for his records.) Installation of locks which do not meet specified keying requirements shall be considered sufficient justification for rejection and replacement of all locks installed on project.

3.3 HARDWARE SETS

Following sets of hardware correspond to hardware symbols shown on drawings. Where hardware set for a single door is specified for a pair of doors; equip each leaf of such pair of doors with set noted. Only those hardware sets that are shown on drawings will be required. Disregard hardware sets listed in specifications but not shown on drawings.

H A R D W A R E S E T S

Hardware for door 104

3 Hinges	BB1168 4 ½ x 4 ½ Ball Tip FWS	US10B	HA
1 Deadlock	BB660BD	613	SC
1 Lockset	AL53BDSAT	613	SC
1 Protection Plate	194S 6″ x 30″	US10B	HA
1 Saddle Threshold	426 BR 32″	US10B	HA
1 Gasketing	160 VDKB 1 x 32″, 2 x 84″		NA
1 Door Bottom	18 VDKB 32″		NA

Hardware for existing exterior door at room 103

1 Deadlock	BB660BD	613	SC
1 Lockset	AL53BDSAT	613	SC

Hardware for door 100A

4 Hinges	BB1279 4 x 4 FWS	US10B	HA
1 Mortise Bolt	0419-102	10B	Baldwin
1 Door Pull	6N	US10B	HA
2 Storm Dr. Closer	V150		Wright Products

Hardware for door 101A

4 Hinges	BB1168 5 x 4 ½ Ball Tip FWS	US10B	HA
1 Dutch Door Bolt	279D	US10B	HA
1 Lockset	AL53BDSAT	613	SC
1 Overhead Holder	10-326	613E	RX

Hardware for door 101B

4 Hinges	BB1168 5 x 4 ½ Ball Tip FWS	US10B	HA
1 Deadlock	BB660BD	613	SC
1 Lockset	AL53BDSAT	613	SC
1 Protection Plate	194S 6″ x 34″	US10B	HA
1 Saddle Threshold	426 BR 36″	US10B	HA
1 Gasket	672 DKB 36″		NA
1 Gasketing	160 VDKB 1 x 36″, 2 x 96″		NA

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SECTION 08 71 00
DOOR HARDWARE

PART 1 - GENERAL

1.1 DESCRIPTION

A. Door hardware and related items necessary for complete installation and operation of doors.

1.2 RELATED WORK

A. Caulking: Section 07 92 00 JOINT SEALANTS.

B. Application of Hardware: Section 08 14 00, WOOD DOORS

C. Painting: Section 09 91 00, PAINTING.

1.3 GENERAL

A. All hardware shall comply with UFAS, (Uniform Federal Accessible Standards) unless specified otherwise.

B. Hardware for application on metal and wood doors and frames shall be made to standard templates. Furnish templates to the fabricator of these items in sufficient time so as not to delay the construction.

C. The following items shall be of the same manufacturer, if possible, except as otherwise specified:

1. Mortise locksets.
2. Hinges for wood doors.

1.4 SUBMITTALS

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES.

B. Hardware Schedule: Prepare and submit hardware schedule in the following form:

Hardware Item	Quantity	Size	Reference Publication Type No.	Finish	Mfr. Name and Catalog No.	Key Control Symbols	UL Mark (if fire rated and listed)	ANSI/BHMA Finish Designation

C. Samples and Manufacturers' Literature: Submit manufacturer’s product literature and installation instructions for each hardware item specified.

D. Certificate of Compliance and Test Reports: Submit certificates that hardware conforms to the requirements specified herein. Certificates shall be accompanied by copies of reports as referenced. The testing shall have been conducted either in the manufacturer's plant and certified by an independent testing laboratory or conducted in an independent laboratory, within four years of submittal of reports for approval.

1.5 DELIVERY AND MARKING

Deliver items of hardware to job site in their original containers, complete with necessary appurtenances including screws, keys, and instructions. Tag one of each different item of hardware and deliver to RE/COTR for reference purposes. Tag shall identify items by Project Specification number and manufacturer's catalog number. These items shall remain on file in RE/COTR's office until all other similar items have been installed in project, at which time the RE/COTR will deliver items on file to Contractor for installation in predetermined locations on the project.

1.6 INSTRUCTIONS

A. Manufacturers' Catalog Number References: Where manufacturers' products are specified herein, products of other manufacturers which are considered equivalent to those specified may be used. Manufacturers whose products are specified are identified by abbreviations as follows:

SC	Schlage	Indianapolis, IN
NA	National Guard Products	Memphis, TN
Hager	Hager Hinge Company	Saint Louis, MO
RX	Rixson	Franklin Park, IL

B. Keying: A new Great Grandmaster key shall be established for this project. The key system shall be removable core type. The manufacturer shall furnish code pattern listings so keys may be reproduced by code. The manufacturer shall design the new key system with the capacity to relock the existing station and also provide for 25 percent expansion capability beyond this requirement. Submit a keying chart for approval showing proposed keying layout and listing expansion capacity.

1. All permanent cores shall be furnished by Owner and installed by the Contractor.
2. Contractor shall provided keyed construction cores.

1.7 APPLICABLE PUBLICATIONS

A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only. In text, hardware items are referred to by series, types, etc., listed in such specifications and standards, except as otherwise specified.

B. American National Standards Institute/Builders Hardware Manufacturers Association (ANSI/BHMA):

A156.1-06.....Butts and Hinges
A156.2-03.....Bored and Pre-assembled Locks and Latches
A156.5-01.....Auxiliary Locks and Associated Products
A156.6-06.....Architectural Door Trim
A156.8-05.....Door Controls-Overhead Stops and Holders
A156.13-05.....Mortise Locks and Latches
A156.16-02.....American National Standard for Auxiliary Hardware
A156.18-06.....Materials and Finishes
A156.21-06.....Thresholds
A156.22-05.....Door Gasketing and Edge Seal Systems
A250.8-03.....Standard Steel Doors and Frames

C. National Fire Protection Association (NFPA):

80-07.....Fire Doors and Fire Windows
101-09.....Life Safety Code

D. Underwriters Laboratories, Inc. (UL):

BUILDING MATERIALS DIRECTORY (2009)

PART 2 - PRODUCTS

2.1 BUTT HINGES

A. ANSI A156.1. The following types of butt hinges shall be used for the types of doors listed, except where otherwise specified:

1. Exterior Doors: Type A2112 for doors 900 mm (3 feet) wide or less and Type A2111 for doors over 900 mm (3 feet) wide. Hinges for exterior doors shall have non-removable pins.
2. Interior Doors: Type 8112 for doors 900 mm (3 feet) wide or less and Type A8111 for doors over 900 mm (3 feet) wide.

2.2 DOOR STOPS

A. Conform to ANSI A156.16.

B. Provide door stops wherever an opened door or any item of hardware thereon would strike a wall, column, equipment or other parts of building construction. For concrete or masonry construction, use lead expansion shields for mounting door stops.

C. Where cylindrical locks with turn pieces or pushbuttons occur, equip wall bumpers Type L02251 (rubber pads having concave face) to receive turn piece or button.

D. Substitute floor stops Type L02141 or L02161 as appropriate, when wall bumpers would not provide an effective door stop.

E. Provide stop Type L02011 or L02181, as applicable for exterior doors.

F. Provide appropriate roller bumper for each set of doors (except where closet doors occur) where two doors would interfere with each other in swinging.

2.3 LOCKS AND LATCHES

A. Conform to ANSI A156.2. Locks and latches for doors 45 mm (1-3/4 inch) thick or over shall have beveled fronts. Lock cylinders shall have not less than 7 pins. Cylinders for all locksets shall be removable core type. Cylinders shall be furnished with construction removable cores and construction master keys. Cylinder shall be removable by special key or tool. Construct all cores so that they will be interchangeable into the core housings of all mortise locks, rim locks, cylindrical locks, and any other type lock included in the Great Grand Master Key System. Disassembly of lever or lockset shall not be required to remove core from lockset. Provide temporary keying device or construction core of allow opening and closing during construction and prior to the installation of final cores.

B. In addition to above requirements, locks and latches shall comply with following requirements:

1. Mortise Lock and Latch Sets: Conform to ANSI/BHMA A156.13. Mortise locksets shall be series 1000, minimum Grade 2. All locksets and latchsets shall have lever handles similar to Falcon S-lever Design. Lever handle shall be fabricated from wrought stainless steel. No substitute lever design or material shall be accepted. All locks and latchsets shall be furnished with curved lip strike and wrought box. Lock function F02 shall be furnished with key plates similar to Russwin's No. A70.

2. Cylindrical Lock and Latch Sets: levers shall meet ADA (Americans with Disabilities Act) requirements. Cylindrical locksets shall be

series 4000 Grade I. Knobs for series 4000 lock and latch sets shall have 57 mm (2-1/4 inch) diameters.

3. Auxiliary locks shall be as specified under hardware sets and conform to ANSI A156.5.

2.4 KEYS

A. Stamp all keys with change number and key set symbol. Furnish keys in quantities as follows:

Locks/Keys	**Quantity**
Cylinder locks	2 keys each
Cylinder lock change key blanks	10 each different key way
Master-keyed sets	6 keys each
Grand Master sets	6 keys each
Great Grand Master set	5 keys
Control key	1 key

2.5 ARMOR PLATES, COMBINATION KICK-MOP PLATES AND DOOR EDGING

A. Conform to ANSI Standard A156.6.

B. Provide protective plates as specified in the hardware schedule.

2.6 THRESHOLDS

A. Conform to ANSI A156.21, mill finish extruded aluminum, except as otherwise specified. In existing construction, thresholds shall be installed in a bed of sealant with machine screws and expansion shields. In new construction, embed aluminum anchors coated with epoxy in concrete to secure thresholds. Furnish thresholds for the full width of the openings.

2.7 WEATHERSTRIPS (FOR EXTERIOR DOORS)

Conform to ANSI A156.22. Air leakage shall not to exceed 0.50 CFM per foot of crack length (0.000774m^3/s/m).

2.8 FINISHES

A. Exposed surfaces of hardware shall have ANSI A156.18, finishes as specified.

2.9 BASE METALS

Apply specified U.S. Standard finishes on different base metals as following:

Finish	**Base Metal**
652	Steel
626	Brass or bronze

630	Stainless steel

PART 3 - EXECUTION

3.1 HARDWARE HEIGHTS

A. For existing buildings locate hardware on doors at heights to match existing hardware. The Contractor shall visit the site, verify location of existing hardware and submit locations to RE/COTR for approval.

3.2 INSTALLATION

A. Hinge leaves shall be sufficiently wide to allow doors to swing clear of door frame trim.

B. Where new hinges are specified for new doors in existing frames or existing doors in new frames, sizes of new hinges shall match sizes of existing hinges.

C. Fastenings: Suitable size and type and shall harmonize with hardware as to material and finish. Provide machine screws and lead expansion shields to secure hardware to concrete or solid masonry. Fiber or rawl plugs and adhesives are not permitted. All fastenings exposed to weather shall be of nonferrous metal.

D. After locks have been installed; show in presence of RE/COTR that keys operate their respective locks in accordance with keying requirements. (All keys, Master Key level and above shall be sent Registered Mail to the Cementary Director along with the bitting list. Also a copy of the invoice shall be sent to the RE/COTR for his records.) Installation of locks which do not meet specified keying requirements shall be considered sufficient justification for rejection and replacement of all locks installed on project.

3.3 HARDWARE SETS

Following sets of hardware correspond to hardware symbols shown on drawings. Where hardware set for a single door is specified for a pair of doors; equip each leaf of such pair of doors with set noted. Only those hardware sets that are shown on drawings will be required. Disregard hardware sets listed in specifications but not shown on drawings.

H A R D W A R E S E T S

Hardware for door 104

3 Hinges	BB1168 4 ½ x 4 ½ Ball Tip FWS	US10B	HA
1 Deadlock	BB660BD	613	SC
1 Lockset	AL53BDSAT	613	SC
1 Protection Plate	194S 6″ x 30″	US10B	HA
1 Saddle Threshold	426 BR 32″	US10B	HA
1 Gasketing	160 VDKB 1 x 32″, 2 x 84″		NA
1 Door Bottom	18 VDKB 32″		NA

Hardware for existing exterior door at room 103

1 Deadlock	BB660BD	613	SC
1 Lockset	AL53BDSAT	613	SC

Hardware for door 100A

4 Hinges	BB1279 4 x 4 FWS	US10B	HA
1 Mortise Bolt	0419-102	10B	Baldwin
1 Door Pull	6N	US10B	HA
2 Storm Dr. Closer	V150		Wright Products

Hardware for door 101A

4 Hinges	BB1168 5 x 4 ½ Ball Tip FWS	US10B	HA
1 Dutch Door Bolt	279D	US10B	HA
1 Lockset	AL53BDSAT	613	SC
1 Overhead Holder	10-326	613E	RX

Hardware for door 101B

4 Hinges	BB1168 5 x 4 ½ Ball Tip FWS	US10B	HA
1 Deadlock	BB660BD	613	SC
1 Lockset	AL53BDSAT	613	SC
1 Protection Plate	194S 6″ x 34″	US10B	HA
1 Saddle Threshold	426 BR 36″	US10B	HA
1 Gasket	672 DKB 36″		NA
1 Gasketing	160 VDKB 1 x 36″, 2 x 96″		NA

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SECTION 08 80 00
GLAZING

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section specifies glass, related glazing materials and accessories. Glazing products specified apply to factory or field glazed items.

1.2 RELATED WORK

A. Factory glazed by manufacturer in following units:
   1. Glazing in existing wood windows: Section 06 20 00 FINISH CARPENTRY.
   2. Glazing in new doors Section 08 14 00 WOOD DOORS.
   3. Glazing in new windows and window storm sashes Section 08 51 13, ALUMINUM CLAD WINDOWS

1.3 PERFORMANCE REQUIREMENTS

A. Building Enclosure Vapor Retarder and Air Barrier:
   1. Utilize the inner pane of multiple pane sealed units for the continuity of the air barrier and vapor retarder seal.
   2. Maintain a continuous air barrier and vapor retarder throughout the glazed assembly from glass pane to heel bead of glazing sealant.

B. Glass Thickness:
   1. Select thickness of exterior glass to withstand dead loads and wind loads acting normal to plane of glass at design pressures calculated in accordance with ASCE 7 and Kentucky Building Code.
   2. Limit glass deflection to 1/200 or flexure limit of glass, whichever is less, with full recovery of glazing materials.
   3. Test in accordance with ASTM E 330.
   4. Thicknesses listed are minimum. Coordinate thicknesses with framing system manufacturers.

1.4 SUBMITTALS

A. In accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Manufacturer's Certificates:
   1. Certificate on shading coefficient.
   2. Certificate on "R" value when value is specified.

C. Warranty: Submit written guaranty, conforming to General Condition requirements, and to “Warranty of Construction” Article in this Section.

D. Manufacturer's Literature and Data:

1. Glass, each kind required.
2. Insulating glass units.
4. Putty, for wood sash glazing.
5. Glazing cushion.
6. Sealing compound.

E. Samples:
1. Historic glass for existing windows.

F. Preconstruction Adhesion and Compatibility Test Report: Submit glazing sealant manufacturer’s test report indicating glazing sealants were tested for adhesion to glass and glazing channel substrates and for compatibility with glass and other glazing materials.

1.5 WARRANTY

A. Warranty: Conform to terms of "Warranty of Construction", FAR clause 52.246-21, except extend warranty period for the following:
1. Insulating glass units to remain sealed for 10 years.

1.6 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. American National Standards Institute (ANSI):
Z97.1-04.....Safety Glazing Material Used in Building - Safety Performance Specifications and Methods of Test.

C. American Society for Testing and Materials (ASTM):
C542-05.....Lock-Strip Gaskets.
C716-06.....Installing Lock-Strip Gaskets and Infill Glazing Materials.
C864-05.....Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers.
C920-08.....Elastomeric Joint Sealants.
C1036-06.....Flat Glass.
C1048-04.....Heat-Treated Flat Glass-Kind HS, Kind FT Coated and Uncoated Glass.
C1115-06 .....Standard Specification for Dense Elastrometric Silicone Rubber Gaskets and Accessories.
C1281-03.....Standard Specification for Preformed Tape Sealants for Glazing Applications.

C1363-05.....Thermal Performance of Building Assemblies, by Means of A Hot Box Apparatus

E330-02.....Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.

E2190-08.....Insulating Glass Unit

D. Code of Federal Regulations (CFR):
16 CFR 1201 - Safety Standard for Architectural Glazing Materials; 1977, with 1984 Revision.

E. National Fenestration Rating Council (NFRC):
Certified Products Directory (Latest Edition).

F. Safety Glazing Certification Council (SGCC):
Certified Products Directory (Issued Semi-Annually).

PART 2 - PRODUCT

2.1 HEAT-TREATED GLASS

A. Clear Heat Strengthened Float Glass:
1. For use as exterior and interior pane of clear insulated glass unit.
2. ASTM C1048, Kind HS, Condition A, Type I, Class 1, Quality q3.
3. Thickness, (1/4 inch) unless otherwise specified on the drawings.

C. Clear Tempered Glass:
1. For use in doors and transoms.
2. ASTM C1048, Kind FT, Condition A, Type I, Class 1, Quality q3.
3. Thickness, 1/4 inch unless otherwise specified on the drawings.

2.2 INSULATING GLASS UNITS

A. Provide preassembled units consisting of sealed lites separated by a dehydrated interspace and complying with ASTM E774 for class CBA units.

B. Provide overall unit and individual component thickness as specified on the drawings

C. Provide sealing system consisting of a dual seal with primary and secondary sealants consisting of Polyisobutylene and silicone.

D. Provide the manufacturer’s standard spacer material and construction.

2.3 GLAZING ACCESSORIES

A. As required to supplement the accessories provided with the items to be glazed and to provide a complete installation. Ferrous metal accessories exposed in the finished work shall have a finish that will not corrode or stain while in service.

B. Setting Blocks: ASTM C864:
   1. Channel shape; having 6 mm (1/4 inch) internal depth.
   2. Shore a hardness of 80 to 90 Durometer.
   3. Block lengths: 50 mm (two inches) except 100 to 150 mm (four to six inches) for insulating glass.
   4. Block width: Approximately 1.6 mm (1/16 inch) less than the full width of the rabbet.
   5. Block thickness: Minimum 4.8 mm (3/16 inch). Thickness sized for rabbet depth as required.

C. Spacers: ASTM C864:
   1. Channel shape having a 6 mm (1/4 inch) internal depth.
   2. Flanges not less 2.4 mm (3/32 inch) thick and web 3 mm (1/8 inch) thick.
   3. Lengths: One to 25 to 76 mm (one to three inches).
   4. Shore a hardness of 40 to 50 Durometer.

D. Sealing Tapes: Comply with ASTM C 1281.

E. Glazing Gaskets: Comply with ASTM C864 or C1115:

G. Glazing Sealants: ASTM C920, silicone neutral cure:
   1. Type S.
   2. Class 25
   3. Grade NS.
   4. Shore A hardness of 25 to 30 Durometer.

H. Color:
   1. Color of glazing compounds, gaskets, and sealants used for aluminum color frames shall match color of the finished aluminum and be nonstaining.
   2. Color of other glazing compounds, gaskets, and sealants which will be exposed in the finished work and unpainted shall be black, gray, or neutral color.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions:
   1. Examine openings for glass and glazing units; determine they are proper size; plumb; square; and level before installation is started.
   2. Verify that glazing openings conform with details, dimensions and tolerances indicated on manufacturer’s approved shop drawings.

B. Advise Contractor of conditions which may adversely affect glass and glazing unit installation, prior to commencement of installation: Do not proceed with installation until unsatisfactory conditions have been corrected.

C. Verify that wash down of adjacent masonry is completed prior to erection of glass and glazing units to prevent damage to glass and glazing units by cleaning materials.

3.2 PREPARATION

A. For sealant glazing, prepare glazing surfaces in accordance with GANA-02 Sealant Manual.

B. Determine glazing unit size and edge clearances by measuring the actual unit to receive the glazing.

C. Shop fabricate and cut glass with smooth, straight edges of full size required by openings to provide GANA recommended edge clearances.

D. Verify that components used are compatible.

E. Clean and dry glazing surfaces.

F. Prime surfaces scheduled to receive sealants, as determined by preconstruction sealant-substrate testing.

3.3 INSTALLATION - GENERAL

A. Install in accordance with GANA-01 Glazing Manual and GANA-02 Sealant Manual unless specified otherwise.

B. Glaze in accordance with recommendations of glazing and framing manufacturers, and as required to meet the Performance Test Requirements specified in other applicable sections of specifications.

C. Glaze doors in a securely fixed or closed and locked position, until sealant, glazing compound, or putty has thoroughly set.

D. Tempered Glass: Install with roller distortions in horizontal position unless otherwise directed.

E. Insulating Glass Units:

1. Glaze in compliance with glass manufacturer's written instructions.
2. When glazing gaskets are used, they shall be of sufficient size and depth to cover glass seal or metal channel frame completely.
3. Do not use putty or glazing compounds.
4. Do not grind, nip, cut, or otherwise alter edges and corners of fused glass units after shipping from factory.
5. Install with tape or gunnable sealant in wood sash.

SPEC WRITER NOTES:

3.5 INSTALLATION - WET METHOD (SEALANT AND SEALANT)

A. Place setting blocks at 1/4 points and install glazing pane or unit.

B. Install removable stops with glazing centered in space by inserting spacer shims both sides at 24 inch intervals, 1/4 inch below sight line.

C. Fill gaps between glazing and stops with sealant to depth of bite on glazing, but not more than 3/8 inch below sight line to ensure full contact with glazing and continue the air and vapor seal.

D. Apply sealant to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

3.6 INSTALLATION - REGLAZING HISTORIC FRAMING

A. Wood Sash: For glazing with glazing beads: Tape or ASTM C920, gunnable sealant.

3.7 REPLACEMENT AND CLEANING

A. Clean new glass surfaces removing temporary labels, paint spots, and defacement after approval by RE/COTR.

B. Replace cracked, broken, and imperfect glass, or glass which has been installed improperly.

C. Leave glass, putty, and other setting material in clean, whole, and acceptable condition.

3.8 PROTECTION

A. Protect finished surfaces from damage during erection, and after completion of work. Strippable plastic coatings on colored anodized finish are not acceptable.

3.9 GLAZING SCHEDULE

A. Refer to Drawings.

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SECTION 09 06 00

MATERIALS AND FINISH SCHEDULE

PART I – GENERAL

1.1 DESCRIPTION

This section contains a coordinated system in which requirements for materials specified in other sections shown are identified by abbreviated material names and finish codes in the room finish schedule or shown for other locations.

1.2 MANUFACTURERS

Manufacturer’s trade names and numbers used herein are only to identify colors, finishes, textures and patterns. Products of other manufacturer’s equivalent to colors, finishes, textures and patterns of manufacturers listed that meet requirements of technical specifications will be acceptable upon approval in writing by contracting officer for finish requirements.

1.3 SUBMITALS

Submit in accordance with Section 01340, Samples and Shop Drawings provide quadruplicate samples for color approval of materials and finishes specified in this section.

1.4 APPLICABLE PUBLICATIONS

A. Publications listed below form a part of this specification to the extent referenced. Publications are referenced in text by basic designation only.

B. MASTER PAINTING INSTITUTE: (MPI)
2001.....Architectural Painting Specification Manual

PART 2- PRODUCTS

2.1 DIVISION 6 – WOOD AND PLASTIC

A. ROUGH & FINISH CARPENTRY (06 10 00 & 06 20 00).

Item	Finish	Color
Wood Exposed to View or Weather	Paint	White, to match existing, selected by Architect

2.2 DIVISION 7 – THERMAL AND MOISTURE PROTECTION

A. SLATE SHINGLES (07 31 26)

Size	Shape	Manufacturer	Manufacturer Color
5/8” thick x 8.5”	diamond	Evergreen Slate Co.	Blue-Gray Purple Red

B. FLASHING AND SHEET METAL (07 60 00)

Item	Material	Finish
Flashing at Chimney	Terne coated stainless steel	
Flashing at Wall	Terne coated stainless steel	
Hanging Gutters and Downspouts	Terne coated stainless steel	
Box Gutters	Terne coated stainless steel	

C. CUSTOM SHEET METAL ROOFING (07 41 13)

Material	Manufacturer / Product
Terne coated stainless steel,	Follansbee, TCS II

D. SEALANTS (07 92 00)

Location	Color	Manufacturer	Manufacturer Color
Chimney to Flashing Joints	To match flashing, and or mortar	As approved by Architect	Manufacturer’s standard, selected by Architect
Flashing to Wall Joints	To match flashing, and or mortar	As approved by Architect	Manufacturer’s standard, selected by Architect
Stone & Brick Sealed Joints	To Match mortar color	As approved by Architect	Manufacturer’s standard, selected by Architect

2.3 DIVISION 08 - OPENINGS

A. SECTION 08 14 00, WOOD DOORS

Component	Finish/Color
Doors	White, to match existing, selected by Architect
Frames	White, to match existing, selected by Architect

B. SECTION 08 51 13, ALUMINUM CLAD WINDOWS

Type	Finish	Glazing	Manufacturer	Mfg. Color Name/No.
Ultimate Casement (CUCA)	Exterior: Fluoropolymer modified acrylic Interior: latex	5/8″ Low E with argon	Marvin	Exterior: Stone White Interior: Latex white
Storm	Latex Prime Paint	3/16″ clear	Marvin	white

C. SECTION 08 71 00, BUILDERS HARDWARE

Item	Material	Finish
Hinges	Metal	US10B
Door Holders	Metal	613E
Lock/ Latches	Metal	613
Armor Plates	Metal	US10B
Door Pulls	Metal	US10B
Weather Strip	Metal	Dark Brown
Threshold	Metal	US10B

2.4 DIVISION 9 – FINISHES

A. SECTION 09 65 16, VINYL SHEET FLOORING

Finish Code	Pattern name	Manufacturer	Mfg. Color Name/No.
RS	Medintone	Armstrong	As selected from full range of 66 colors options

B. PAINT AND COATINGS (09 91 00)

1. MPI Gloss and Sheen Standards

		Gloss @60	Sheen @85
Gloss Level 1	a traditional matte finish-flat	max 5 units, and	max 10 units
Gloss Level 2	a high side sheen flat-“a velvet-like” finish	max 10 units, and	10-35 units
Gloss Level 3	a traditional “egg-shell like” finish	10-25 units, and	10-35 units
Gloss Level 4	a “satin-like” finish	20-35 units, and	min 35 units

Gloss Level 5 a traditional semi-gloss 35-70 units

Gloss Level 6 a traditional gloss 70-85 units

Gloss level 7 a high gloss more than 85 units

2. Paint code	Gloss	Manufacturer	Mfg. Color Name/No.
P1, (all)	To match existing adjacent surfaces	As approved by Architect	White, to match existing, selected by Architect

PART III EXECUTION

3.1 FINISH SCHEDULES & MISCELLANEOUS ABBREVIATIONS

A. Refer to drawings for finish schedule and abbreviations.

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SECTION 09 24 00
PORTLAND CEMENT PLASTERING

PART 1 GENERAL

1.1 DESCRIPTION

A. This section specifies Portland cement based plaster for repairs of existing plaster.

1.2 SUBMITTALS

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Manufacturer's Literature and Data:

1. Accessories for plaster, each type.
2. Metal plastering bases, each type.
3. Fasteners.
4. Bonding compounds, including application instructions.
5. Admixtures, including mixing and application instructions.

1.3 PROJECT CONDITIONS

A. Comply with ASTM C926.

B. Maintain work areas for interior work at a temperature of not less than 4°C (40°F) for not less than 48 hours prior to application of plaster, during application of plaster and until plaster is completely dry.

C. Plaster shall not be applied to frozen surfaces or surfaces containing frost.

D. Frozen materials shall not be used in the mix.

E. Plaster coats shall be protected against freezing for a period of not less than 24 hours after application.

1.4 APPLICABLE PUBLICATIONS

A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by basic designation only.

B. American Society for Testing And Materials (ASTM):

A653/A653M-09.....Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

A641-09a.....Zinc-Coated (Galvanized) Carbon Steel Wire

C11-08c.....Terminology Relating to Gypsum and Related Building Materials and Systems.

C91-05.....Masonry Cement

C150-07.....Portland Cement

C206-03.....Finishing Hydrated Lime

C207-06.....Hydrated Lime for Masonry Purposes

C260-06.....Air Entraining Admixtures for Concrete.
C841-08e1.....Installation of Interior Lathing and Furring
C847-09.....Metal Lath
C897-05.....Aggregate for Job-Mixed Portland Cement Based Plasters
C926-06.....Application of Portland Cement-Based Plaster
C933-07b.....Welded Wire Lath
C979-05.....Pigments for Integrally Colored Concrete
C1002-07.....Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs
C1063-08.....Installation of Lathing and Furring to Receive Interior and Exterior Portland Cement-Based Plaster

C. Commercial Item Description (CID):
A-A-55615-06.....Shield, Expansion (Wood Screw and Lag Bolt Self-Threading Anchors)
UU-B-790A-92.....Building Paper, Vegetable Fiber (Kraft, Waterproofed, Water Repellent and Fire Resistant)

PART 2 - PRODUCTS

2.1 METAL PLASTERING BASES

A. Expanded Metal Lath:
1. ASTM C847, with ASTM A653 G60, Hot Dipped Galvanized Coating.
2. Weight: 1.8 kg/m^2 (3.4 pounds per square yard).

B. Building Paper Backing for Metal Plastering Bases:
1. Backing attached to lath as specified in ASTM C933.
2. Vapor Permeable Backing: Fed. Spec. UU-B-790, Type I, Grade D.
3. Water Resistant Backing: Fed. Spec. UU-B-790, Type I, Grade B.

2.2 ACCESSORIES FOR CEMENT PLASTER

A. ASTM C841, except fabricate from zinc alloy.
B. ASTM C1063
C. Control Joints: ASTM C841, zinc.
D. Corner Bead
E. Casing Bead

2.3 FASTENERS

A. Comply with ASTM C1063

2.4 CEMENT

A. Portland: ASTM C150, Type I.
B. Masonry: ASTM C91. Lime where added, ASTM C207, Type S.

2.5 LIME

A. ASTM C206, Type S.

B. ASTM C207, Type S.

2.6 AGGREGATES (SAND)

A. ASTM C897, graded as required to suit texture of finish specified.

2.7 BONDING AGENT

A. ASTM C932

2.8 FACTORY PREPARED FINISH COAT FOR CEMENT PLASTER (STUCCO)

A. Factory prepared dry blend of materials, integrally colored, designed for exterior finish coat application.

B. Pigments: ASTM C979, lime proof mineral oxide.

C. Not more than 35 percent, by weight of all ingredients (cement, aggregate, hydrated lime, admixture and coloring pigment) shall pass a number 100 sieve.

2.9 ADMIXTURES

Air Entrainment: ASTM C260.

PART 3 - EXECUTION

3.1 APPLYING METAL PLASTERING BASES

A. In accordance with ASTM C841 and C1063, except as otherwise specified or shown.

3.2 INSTALLING PLASTERING ACCESSORIES

A. Install accessories in accordance with ASTM C841, except as otherwise specified.

B. Corner Beads: Install at all vertical and horizontal external plaster corners, as required to establish grounds, and where shown.

C. Casing Beads:

1. Install casing beads where shown and at transitions to dissimilar materials.

3.3 SURFACE PREPARATION OF SOLID BASES

A. Surfaces that are to receive plaster shall be prepared and conditioned in accordance with ASTM C926, except as otherwise specified.

B. Existing surfaces of masonry:

1. Clean surface of dirt and other foreign matter which will prevent bond.
2. Apply dash bond coat or bonding agent as specified herein.
3. Where existing surfaces have a coating such as paint or bituminous waterproofing apply metal plastering base as specified herein.

3.4 PORTLAND CEMENT BASED PLASTER

A. Comply with ASTM C926

3.5 TOLERENCES

A. Do not deviate more than 1/4 inch in 10 feet from true plane in finished plaster surfaces as measured with a 10 foot straight edge.

B. Finish plaster flush with metal accessory surfaces and other built-in items unless otherwise directed.

3.5 SCHEDULE

A. Restore existing plaster surfaces where specified on the drawings.

B. For plaster wall surfaces scheduled to be restored that are currently concealed from view behind wood paneling bidders shall assume restoration will require repair to 20% of the full wall surface area. Cost adjustment for actual work required will be made using contract unit prices.

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SECTION 09 29 00
GYPSUM BOARD

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section specifies installation and finishing of gypsum board & ceiling suspension system.

1.2 RELATED WORK

A. Framing for walls, partitions, furring, soffits and ceilings: Section 06 10 00 ROUGH CARPENTRY.

B. Caulking: Section 07 92 00 JOINT SEALANTS.

1.3 TERMINOLOGY

A. Definitions and description of terms shall be in accordance with ASTM C11, C840, and as specified.

1.4 SUBMITTALS

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Manufacturer's Literature and Data:

1. Cornerbead and edge trim.
2. Finishing materials.
3. Gypsum board, each type.

1.5 DELIVERY, IDENTIFICATION, HANDLING AND STORAGE

A. In accordance with the requirements of ASTM C840.

1.6 ENVIRONMENTAL CONDITIONS

A. In accordance with the requirements of ASTM C840.

1.7 APPLICABLE PUBLICATIONS

A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.

B. American Society for Testing And Materials (ASTM):

C11-08c.....Terminology Relating to Gypsum and Related Building Materials and Systems

C475-02(R2007).....Joint Compound and Joint Tape for Finishing Gypsum Board

C840-08.....Application and Finishing of Gypsum Board

C1002-07.....Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs

C1047-05.....Accessories for Gypsum Wallboard and Gypsum Veneer Base

C1396-09.....Gypsum Board

PART 2 - PRODUCTS

2.1 GYPSUM BOARD

A. Gypsum Board: ASTM C1396, (Type X,) 5/8 inch thick unless shown otherwise. Shall contain a minimum of 20 percent recycled gypsum.

B. Gypsum cores shall contain a minimum of 95 percent post industrial recycled gypsum content. Paper facings shall contain 100 percent post-consumer recycled paper content.

2.2 SUSPENDED CEILING SYSTEM FOR GYPSUM BOARD

A. Conform to ASTM C635 and C754. For materials and sizes

B. Conform to ASTM C641 for wire hangers.

2.3 ACCESSORIES

A. ASTM C1047.

2.4 FASTENERS

A. ASTM C1002 and ASTM C840, except as otherwise specified.

2.5 FINISHING MATERIALS AND LAMINATING ADHESIVE

A. ASTM C475 and ASTM C840.

PART 3 - EXECUTION

3.1 GYPSUM BOARD HEIGHTS

A. Extend gypsum board from floor to finished plaster ceiling above unless otherwise specified on the drawings.

3.2 INSTALLING FURRED AND SUSPENDED CEILINGS OR SOFFITS

A. Install furred and suspended ceilings or soffits in accordance with ASTM C754 or ASTM C841 except as otherwise specified or shown for screw attached gypsum board ceilings and for plaster ceilings or soffits.

B. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or ceiling suspension system. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, counter splaying, or other equally effective means.

C. Where width of ducts and other construction within ceiling plenum produces hanger spacing that interfere with the location of hangers required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards.

D. Secure wire hangers by looping and wire-tying, either directly to structures or to inserts, eyescrews, or other devices and fasteners that are secure and appropriate for substrate, and in a manner that will not cause them to deteriorate or otherwise fail.

E. Install suspended steel framing components in sizes and at spacing indicated, but not less than that required by the referenced steel framing installation standard.
   1. Wire Hangers: 48 inches o.c.
   2. Carrying Channels (Main Runners): 48 inches o.c.
   3. Furring Channels (Furring Members): 16 inches o.c
F. Installation Tolerances: Install steel framing components for suspended ceilings so that cross-furring or grid suspension members are level to within 1/8 inch in 12 feet as measured both lengthwise on each member and transversely between parallel members.
G. Wire-tie or clip furring members to main runners and to other structural supports as indicated.
H. Grid Suspension System: Attach perimeter wall track or angle where grid suspension system meets vertical surfaces. Mechanically join main beam and cross-furring members to each other and butt-cut to fit into wall track

3.3 INSTALLING GYPSUM BOARD

A. Install gypsum board in accordance with ASTM C840, using only concealed metal corner beads. Use of exposed plastic accessories is NOT allowed.
B. Accessories:
   1. Install the following accessories in accordance with ASTM C1047.
      a. Corner Beads – concealed metal, fully mudded
      b. Edge Trim (casing beads) – concealed metal, fully mudded.

3.4 FINISHING OF GYPSUM BOARD

A. Finish joints, edges, corners, and fastener heads in accordance with ASTM C840. Use Level 5 finish for all finished areas open to public view; level 2 finish in utility, maintenance and service areas and level 1 in plenums, attics and other concealed areas. Follow manufacturer’s fire testing reports where fire resistant construction is shown on drawings.

3.5 REPAIRS

A. After taping and finishing has been completed, and before decoration, repair all damaged and defective work, including nondecorated surfaces.
B. Patch holes or openings 1/2 inch or less in diameter, or equivalent size, with a setting type finishing compound or patching plaster.
C. Repair holes or openings over 1/2 inch diameter, or equivalent size, with 5/8 inch thick gypsum board secured in such a manner as to provide solid substrate equivalent to undamaged surface.

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SECTION 09 64 00
MAINTENANCE OF WOOD FLOORING

PART 1 GENERAL

1.1 SUMMARY

A. Section includes refinishing of existing wood flooring, stripping, sanding, and surface finishing.

B. Related Sections:
1. Section 02 05 00 Minor Demolition for Renovation: protection of existing wood floor.

1.2 REFERENCES

A. APA-The Engineered Wood Association:
1. APA/EWA PS 1 - Voluntary Product Standard for Construction and Industrial Plywood.

B. ASTM International:
1. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials.

C. Maple Flooring Manufacturers Association:
1. MFMA - MFMA Guide Specifications.

D. National Fire Protection Association:
1. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source.

E. National Oak Flooring Manufacturers Association:
1. NOFMA 24 - Installing Hardwood Flooring - Strip, Plank & Parquet.

1.3 SUBMITTALS

A. Section 01 33 23 – SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

B. Product Data: Submit data for floor stripping, sealing, and finish materials.

C. Manufacturer's Installation Instructions: Submit standard and special installation procedures, and perimeter conditions requiring special attention. Include manufacturer's recommendations for accessory products.

1.4 CLOSEOUT SUBMITTALS

A. Section 01 00 00 – GENERAL REQUIREMENTS: 1.23 Instructions.

B. Operation and Maintenance Data: Submit maintenance procedures, recommended maintenance materials, suggested schedule for cleaning, stripping, and re-finishing, stain removal methods, and polishes and waxes.

1.5 QUALITY ASSURANCE

A. Surface Burning Characteristics:
1. Floor Finishes: Class I, minimum 0.45 watts/sq cm when tested in accordance with NFPA 253.

1.6 QUALIFICATIONS

A. Installer: Company specializing in performing work of this section with minimum three years documented experience approved by manufacturer.

1.7 ENVIRONMENTAL REQUIREMENTS

A. Section 01 57 19 - TEMPORARY ENVIRONMENTAL CONTROLS.

B. Do not refinish floor until ambient air at installation space has moisture content stabilized between 35 and 50 percent and temperature is stabilized between 65 and 75 degrees F.

C. Provide heat, light (minimum of 80 footcandles), and ventilation prior to installation.

D. Maintain room temperature and humidity for period of two days prior to refinishing work, during installation, and continuously after installation.

1.8 COORDINATION

A. Coordinate work of this section with all other interior finishes. Schedule work after completion of all demolition work.

PART 2 PRODUCTS

2.1 ACCESSORIES

A. Floor Sealer: Two coats polyurethane.

B. Floor Finish: Two coats clear polyurethane.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify ambient temperatures, and humidity levels are within acceptable tolerances. Verify ventilation systems are operational and can be utilized to facilitate curing of coatings.

B. Verify all activities generating dirt/dust are complete and the room can be sealed from other areas.

3.2 FLOOR STRIPPING

A. Remove all existing coatings utilizing MFMA approved products.

3.3 FLOOR SANDING

A. Mask off adjacent surfaces before beginning sanding.

B. Sand flooring to smooth even finish with no evidence of sander marks.

C. Machine sand with coarse, fine paper to a smooth, even and uniform surface removing not more than 1/32” thickness of wood flooring.

D. Remove sanding dust from entire surface by tack of vacuum.

E. Refer to MFMA sanding and finishing guide for procedures.

3.4 FLOOR FINISHING

A. Finishing:
1. Inspect entire area of floor to insure that surface is acceptable for finishing, completely free from sanding dust and perfectly clean.
2. Apply two coats of sealer in accordance with manufacturer’s instructions.
3. Apply first finish coat, allow to dry, then buff lightly with steel wool to remove irregularities. Vacuum clean and wipe with damp cloth before applying succeeding coat.
4. Apply second coat. Allow to dry.

3.5 CLEANING

A. Clean and polish floor surfaces.

3.6 PROTECTION OF INSTALLED CONSTRUCTION

A. Prohibit traffic on floor finish for 48 hours after installation.

B. If traffic must occur on the floor prior to Owner Occupancy and after 48 hours then protect installed flooring with kraft paper.

3.7 SCHEDULES

A. Refinish existing wood floor in Reception 101 as work of Base Bid.

B. Refinish existing wood floor in Workroom 102 and Director’s Office 103 as work of Bid Alternate #1.

END OF SECTION

SECTION 09 65 16
RESILIENT SHEET FLOORING

PART 1 - GENERAL

1.1 DESCRIPTION

A. This Section specifies nonbacked, nonlayered polyurethane coated homogeneous vinyl composition of polyvinyl chloride resin, plasticizers, stabilizers, fillers and pigments sheet flooring and cove base.

1.2 RELATED WORK

A. Removal of existing sheet flooring: Section 02 50 00 Minor Demolition for Renovation.

1.3 QUALITY CONTROL-QUALIFICATIONS:

A. The Contracting Officer shall approve products of proposed manufacturer.

B. The sheet vinyl floor coverings shall meet fire performance characteristics as determined by testing products, per ASTM test method, indicated below by Underwriters Laboratories, Inc. (UL) or another recognized testing and inspecting agency acceptable to authorities having jurisdiction.

1. Critical Radiant Flux: 0.45 watts per sq. cm or more, Class I, per ASTM E648.
2. Smoke Density: Less than 450 per ASTM E662.

C. The floor covering manufacturer shall certify that products supplied for installation comply with local regulations controlling use of volatile organic compounds (VOC’s).

1.4 SUBMITTALS

A. In accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES, submit following:

B. Manufacturer's Literature and Data:

1. Description of resilient material and accessories to be provided.
2. Resilient material manufacturer's recommendations for adhesives.
3. Application and installation instructions.

C. Samples:

1. Sheet materials: Submit samples of full range of color and pattern options for selection.
2. Rubber base: Submit samples of full color range.

D. Certificates: Quality Control Certificate Submittals and lists specified in paragraph, QUALIFICATIONS.

1.5 PROJECT CONDITIONS

A. Maintain temperature of floor materials and room, where work occurs, above 65 °) and below 100 °) for 48 hours before, during and for 48

hours after installation. After above period, room temperature shall not fall below 55 °F.

B. Construction in or near areas to receive flooring work shall be complete. Follow flooring manufacturer's recommendations for bond and moisture testing.

C. Schedule construction so that floor receives no construction traffic when completed.

1.6 DELIVERY, STORAGE AND HANDLING

A. Follow manufacturer's instructions for storage and protection from damage by handling and construction operations

B. Move sheet vinyl floor coverings and installation accessories into spaces where they will be installed at least 48 hours in advance of installation.

1.7 APPLICABLE PUBLICATIONS

A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in text by basic designation only.

B. American Society For Testing Materials (ASTM):

E648-08.....Critical Radiant Flux of Floor-Covering Systems Using a Radiant Energy Source.

E662-09.....Specific Optical Density of Smoke Generated by Solid Materials.

E1907-06.....Evaluating Moisture Conditions of Concrete Floors to Receive Resilient Floor Coverings

F1913-04.....Sheet Vinyl Flooring without Backing

C. Resilient Floor Covering Institute (RFCI):

Recommended Work Practices for Removal of Resilient Floor Coverings.

1.8 SCHEDULING

Interior finish work such as plastering, drywall finishing, ceiling work, and painting work shall be complete and dry before installation. Mechanical, electrical, and other work above ceiling line shall be completed. Heating, ventilating, and air conditioning systems shall be installed and operating in order to maintain temperature and humidity requirements.

1.9 WARRANTY:

Submit written warranty, in accordance with FAR clause 52.246-21, Warranty of Construction requirements except that warranty period shall be extended to include two (2) years.

PART 2 - PRODUCTS

2.1 SHEET VINYL FLOORING

A. ASTM F1913.

B. Minimum nominal thickness 0.08 inch; 6 ft minimum width.

C. Wear Layer thickness: 0.08 inch.

D. Critical Radiant Flux: 0.45 watts per sq.cm or more, Class I, per ASTM E648.

E. Smoke density: less than 450 per ASTM E662.

F. Color and pattern of sheet flooring of the same production run.

2.2 RUBBER WALL BASE

A. Base: ASTM F1861 rubber top set; coved

B. Height: 4 inch.

C. Thickness: 0.125 inch thick.

D. Finish: Satin.

E. Length: roll

2.3 APPLICATION MATERIALS AND ACCESSORIES

A. Floor and Base Adhesive: Water resistant type recommended by the sheet flooring manufacturer for the conditions of use.

PART 3 - EXECUTION

3.1 PROJECT CONDITIONS

A. Maintain temperature of sheet flooring above 36 °C (65 °F), for 48 hours before installation.

B. Maintain temperature of rooms where sheet flooring work occurs above 36 °C (65 °F), for 48 hours, before installation and during installation.

C. After installation, maintain temperature at or above 36 °C (65 °F.)

D. Building is permanently enclosed.

E. Wet construction in or near areas to receive sheet flooring is complete, dry and cured.

3.2 SUBFLOOR PREPARATION

A. Broom or vacuum clean substrates to be covered by sheet vinyl floor coverings immediately before installation. Following cleaning, examine substrates to determine if there is visually any evidence of moisture, alkaline salts, carbonation, or dust.

B. Correct conditions which will impair proper installation, including holes, pits, dents, protrusions, cracks or joints.

C. Clean floor of oil, paint, dust and deleterious substances. Leave floor dry and cured free of residue from existing curing or cleaning agents.

3.2 INSTALLATION OF FLOORING

A. Install work in strict compliance with manufacturer's instructions and approved layout drawings.
B. Maintain uniformity of sheet vinyl floor covering direction and avoid cross seams.
C. Arrange for a minimum number of seams and place them in inconspicuous and low traffic areas, but in no case less than 150 mm (6 inches) away from parallel joints in flooring substrates.
D. Match edges of resilient floor coverings for color shading and pattern at seams.
E. Where resilient sheet flooring abuts other flooring material floors shall finish level.
F. Extend sheet vinyl floor coverings into toe spaces, door reveals, closets, and similar openings.
G. Inform the Resident Engineer of conflicts between this section and the manufacturer's instructions or recommendations for auxiliary materials, or installation methods, before proceeding.
H. Install sheet in full coverage adhesives.
   1. Air pockets or loose edges will not be accepted.
   2. Trim sheet materials to touch in the length of intersection at pipes and vertical projections; seal joints at pipe with waterproof cement or sealant.
I. Keep joints to a minimum; avoid small filler pieces or strips.
J. Follow manufacturer’s recommendations for seams at butt joints. Do not leave any open joints that would be readily visible from a standing position.
K. Follow manufacturer’s recommendations regarding pattern match, if applicable.

3.5 INSTALLATION – BASE

A. Application of vinyl cove base by single or multiple bead caulking guns shall not be allowed. Application shall be made with notched full-spread trowels covering the entire surface within 1/16” of all edges. The amount of adhesive shall be determined by manufacturer’s recommendations and surface texture. All excess adhesive shall be removed according to manufacturer’s specifications.
B. Trowel apply adhesive to back of base – covering the entire surface within 1/16” of all edges. The amount of adhesive shall be determined by manufacturer’s recommendation and substrate surface texture. All excess adhesive shall be removed according to mfr. specifications.

C. Fit joints tightly and make vertical. Minimize to greatest degree possible all joints. Maintain minimum dimension of 18 inches between joints.
D. Miter internal corners. At external corners, “v” cut back of base strip to 2/3 of it’s thickness and fold.
E. Install base on solid backing. Bond tightly to wall and floor surfaces.
F. Scribe and fit to door frames and other interruptions.

3.5 CLEANING

A. Clean small adhesive marks during application of sheet flooring and base before adhesive sets, excessive adhesive smearing will not be accepted.
B. Remove visible adhesive and other surface blemishes using methods and cleaner recommended by floor covering manufacturers.
C. Clean and polish materials per flooring manufacturer’s written recommendations.
D. Vacuum floor thoroughly.
E. Do not wash floor until after period recommended by floor covering manufacturer and then prepare in accordance with manufacturer’s recommendations.
F. Upon completion, Resident Engineer shall inspect floor and base to ascertain that work was done in accordance with manufacturer's printed instructions.
G. Perform initial maintenance according to flooring manufacturer’s written recommendations.

3.6 PROTECTION:

A. Protect installed flooring as recommended by flooring manufacturer against damage from rolling loads, other trades, or placement of fixtures and furnishings.
B. Keep traffic off sheet flooring for 24 hours after installation.
C. Where construction traffic is anticipated, cover sheet flooring with reinforced kraft paper properly secured and maintained until removal is authorized by the Resident Engineer.
D. Where protective materials are removed and immediately prior to acceptance, repair any damage, re-clean sheet flooring, lightly re-apply polish and buff floor.

- - - E N D - - -

SECTION 09 91 00
PAINTING AND SPECIAL COATINGS

PART 1-GENERAL

1.1 DESCRIPTION

A. Painting includes stains, varnishes, sealers, cementitious coatings, new clear sealer on existing porch and identity markings.

B. Removal of existing exterior paint coatings on all wood surfaces to bare wood using methods specified in Section 02 83 33.13 Lead Based Paint Removal and Disposal.

c. Preparation of all surfaces scheduled to received new paint coatings.

1.2 RELATED WORK

A. Removal of existing exterior paint coatings: Section 02 83 33.13 Lead-Based Paint Removal and Disposal.

B. Type of Finish, Color, and Gloss Level of Finish Coat: Section 09 06 00, SCHEDULE FOR FINISHES.

1.3 SUBMITTALS

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Manufacturer's Literature and Data:
Before work is started, or sample panels are prepared, submit manufacturer's literature, the current Master Painters Institute (MPI) "Approved Product List" indicating brand label, product name and product code as of the date of contract award, will be used to determine compliance with the submittal requirements of this specification. The Contractor may choose to use subsequent MPI "Approved Product List", however, only one list may be used for the entire contract and each coating system is to be from a single manufacturer. All coats on a particular substrate must be from a single manufacturer. No variation from the MPI "Approved Product List" where applicable is acceptable.

C. Samples:
1. After painters' materials have been approved and before work is started submit samples showing each type of finish and color specified.
2. Samples to show color: Composition board, 150 by 150 (6 inch by 6 inch).

D. Manufacturers' Certificates indicating compliance with specified requirements:
1. Manufacturer's paint substituted for Federal Specification paints meets or exceeds performance of paint specified.

1.4 DELIVERY AND STORAGE

A. Deliver materials to site in manufacturer's sealed container marked to show following:

1. Name of manufacturer.
2. Product type.
3. Batch number.
4. Instructions for use.
5. Safety precautions.

B. In addition to manufacturer's label, provide a label legibly printed as following:
1. Federal Specification Number, where applicable, and name of material.
2. Surface upon which material is to be applied.
3. If paint or other coating, state coat types; prime, body or finish.

C. Maintain space for storage, and handling of painting materials and equipment in a neat and orderly condition to prevent spontaneous combustion from occurring or igniting adjacent items.

D. Store materials at site at least 24 hours before using, at a temperature between 18 and 30 degrees C (65 and 85 degrees F).

1.5 FIELD SERVICES

A. Bidders shall field verify existing conditions and test existing paint coatings to ensure compatibility of proposed new coatings prior to preparation of bid. Include all costs required to adjust specified coatings as appropriate for compatibility with existing conditions.

1.6 APPLICABLE PUBLICATIONS

A. Publications listed below form a part of this specification to the extent referenced. Publications are referenced in the text by basic designation only.

B. American Conference of Governmental Industrial Hygienists (ACGIH):
ACGIH TLV-BKLT-2009.....Threshold Limit Values (TLV) for Chemical Substances and Physical Agents and Biological Exposure Indices (BEIs)
ACGIH TLV-DOC-2009.....Documentation of Threshold Limit Values and Biological Exposure Indices, (Seventh Edition)

C. American National Standards Institute (ANSI):
A13.1-07.....Scheme for the Identification of Piping Systems

D. American Society for Testing and Materials (ASTM):
D260-86 (2001).....Boiled Linseed Oil

E. Federal Specifications (Fed Spec):
TT-P-1411A.....Paint, Copolymer-Resin, Cementitious (For Waterproofing Concrete and Masonry Walls) (CEP)

F. Master Painters Institute (MPI):
No. 4-08.....Interior/ Exterior Latex Block Filler

No. 5-02.....Exterior Alkyd Wood Primer
No. 7-02.....Exterior Oil Wood Primer
No. 8-07.....Exterior Alkyd, Flat MPI Gloss Level 1 (EO)
No. 9-07.....Exterior Alkyd Enamel MPI Gloss Level 6 (EO)
No. 10-07.....Exterior Latex, Flat (AE)
No. 11-07.....Exterior Latex, Semi-Gloss (AE)
No. 26-03.....Cementitious Galvanized Metal Primer
No. 27-07.....Exterior / Interior Alkyd Floor Enamel, Gloss (FE)
No. 43-06.....Interior Satin Latex, MPI Gloss Level 4
No. 44-08.....Interior Low Sheen Latex, MPI Gloss Level 2
No. 45-02.....Interior Primer Sealer
No. 46-04.....Interior Enamel Undercoat
No. 47-02.....Interior Alkyd, Semi-Gloss, MPI Gloss Level 5 (AK)
No. 48-05.....Interior Alkyd, Gloss, MPI Gloss Level 6 (AK)
No. 49-02.....Interior Alkyd, Flat, MPI Gloss Level 1 (AK)
No. 50-08.....Interior Latex Primer Sealer
No. 51-02.....Interior Alkyd, Eggshell, MPI Gloss Level 3
No. 52-06.....Interior Latex, MPI Gloss Level 3 (LE)
No. 53-06.....Interior Latex, Flat, MPI Gloss Level 1 (LE)
No. 54-06.....Interior Latex, Semi-Gloss, MPI Gloss Level 5 (LE)
No. 59-07.....Interior/Exterior Alkyd Porch & Floor Enamel, Low Gloss (FE)
No. 60-07.....Interior/Exterior Latex Porch & Floor Paint, Low Gloss
No. 68-07.....Interior/ Exterior Latex Porch & Floor Paint, Gloss
No. 77-08.....Epoxy Cold Cured, Gloss (EC)
No. 79-08.....Marine Alkyd Metal Primer
No. 94-07.....Exterior Alkyd, Semi-Gloss (EO)
No. 95-03.....Fast Drying Metal Primer
No. 101-08.....Epoxy Anti-Corrosive Metal Primer
No. 108-08.....High Build Epoxy Coating, Low Gloss (EC)
No. 114-06.....Interior Latex, Gloss (LE) and (LG)
No. 119-07.....Exterior Latex, High Gloss (acrylic) (AE)
No. 134-06.....Primer, Galvanized, Water Based
No. 135-06.....Non-Cementitious Galvanized Primer
No. 138-06.....Interior High Performance Latex, MPI Gloss Level 2 (LF)
No. 139-06.....Interior High Performance Latex, MPI Gloss Level 3 (LL)
No. 140-06.....Interior High Performance Latex, MPI Gloss Level 4

No. 141-06.....Interior High Performance Latex (SG) MPI Gloss Level 5

G. Steel Structures Painting Council (SSPC):
SSPC SP 1-04.....Solvent Cleaning
SSPC SP 2-04.....Hand Tool Cleaning
SSPC SP 3-04.....Power Tool Cleaning

PART 2 - PRODUCTS

2.1 MATERIALS

A. Wood Sealer: thinned with thinner recommended by manufacturer at rate of about one part of thinner to four parts of varnish.
B. Exterior Alkyd Wood Primer: MPI 5
C. Exterior Oil Wood Primer: MPI 7
D. Exterior Alkyd Enamel (EO): MPI 9.
E. Interior Primer Sealer: MPI 45.
F. Interior Enamel Undercoat: MPI 46
G. Interior Latex Primer Sealer: MP1 50
H. Interior Latex, MPI Gloss level 3 (LE): MPI 52
I. Interior Latex, Flat, MPI Gloss level 1 (LE): MPI 53
J. Wood Filler Paste: MPI 91
K. Exterior Alkyd, Semi-Gloss (EO): MPI 94
L. Fast Drying Metal Primer: MPI 95
M. Interior Latex, Gloss (LE) and (LG): MPI 119
N. Exterior Latex, High Gloss (acrylic) (AE) MPI 119
O. Waterborne Galvanized Primer: MPI 134
P. Non-Cementitious Galvanized Primer: MPI 135.
Q. Cementitious Coating: Portland-cement based coating for masonry with the following performance characteristics:
   1. Service temperatures: Immersion, up to 140 degrees F; cleaning water, up to 200 degrees F; dry air, up to 220 degrees F.
   2. VOC: 0 lbs/gal (0 g/L) less water and exempt solvents.
   3. Initial Set, minutes at 70 degree F, 50 percent relative humidity: 10 minutes per Lab Method.
   4. Final Set, minutes at 70 degree F, 50 percent relative humidity: 90 minutes per Lab Method.
   5. Density (cured): 129 pounds per foot (2,080 kg/m) per Lab Method.
   6. Positive resistance to hydrostatic pressure, hrs, at 200 psi, 461 head feet, air cured at 70 degree F, 50 percent relative humidity: 752 (No leakage, no softening) per CRD C 48, modified.

7. Negative resistance to hydrostatic pressure, hours, at 200 psi, 461 head feet, air cured at 70 degree F, 50 percent relative humidity: 664 (Limited dampness) per CRD C 48, modified.
8. Potable water (direct contact): Suitable approved per BS6920, NSF Standard 61.
9. Water absorption, boiling water submersion at 24 hour: 3.6 percent per ASTM C 67 (Section 7.3).
10. Compressive strength, ASTM C 109:
    a. 7 days: 4,200 psi (29 MPa)
    b. 28 days: 6,030 psi (42 MPa)
11. Flexural strength, ASTM C 348:
    a. 7 days: 360 psi (2.5 MPa)
    b. 28 days: 1,027 psi (7 MPa)
12. Tensile strength, ASTM C 190:
    a. 7 days: 250 psi (2 MPa).
    b. 28 days: 440 psi (3 MPa).
13. Modulus of elasticity, ASTM C 469, 28 days: 2.72 x 10 to the 6th psi (1.87 x 10 to the 4th MPa).
14. Permeance:
    a. Perms: 12 (0.10698) per ASTM E 96
    b. Metric permeability 18 x 10 to the 3rd resistance (water-vapor transmission) per Swedish standard SS-02-15-82.
15. Impact strength (Gardener impact tester): No chipping per Fed. A. Spec. TT-P-0035
16. Hardness, (Barber Colemen Impressor) Requirement min = 30, max = 60 (para 4.4.9) Fed. Spec. TT-P-0035:
    a. 7 days: 35.
    b. 14 days: 47.
    c. 21 days: 52.
17. Abrasion resistance 3,000 L sand: Passed per Fed. Spec. TT-P-141B.
18. Fungus resistance at 21 days: No growth; meets all requirements of Fed. Spec. TT-P-29B.
19. Surface burning characteristics per ASTM E 84:
    a. Flame Spread: 0.
    b. Smoke developed: 5.
    c. Fire Propagation Flame spread: Index = 1.5, Class 1 per BS476: Part 6:1981, BS476: Part 7:1971.

2.2 PAINT PROPERTIES

A. Use ready-mixed (including colors), except two component epoxies, polyurethanes, polyesters, paints having metallic powders packaged separately and paints requiring specified additives.

B. Where no requirements are given in the referenced specifications for primers, use primers with pigment and vehicle, compatible with substrate and finish coats specified.

2.3 REGULATORY REQUIREMENTS/QUALITY ASSURANCE

A. Paint materials shall conform to the restrictions of the local Environmental and Toxic Control jurisdiction.
   1. Volatile Organic Compounds (VOC): VOC content of paint materials shall not exceed 10g/l for interior latex paints/primers and 50g/l for exterior latex paints and primers.
   2. Lead-Base Paint:
      a. Lead based paint is not permitted to be used.
      b. For lead-paint removal, see Section 02 83 33.13, LEAD-BASED PAINT REMOVAL AND DISPOSAL.
   3. Asbestos: Materials shall not contain asbestos.
   4. Chromate, Cadmium, Mercury, and Silica: Materials shall not contain zinc-chromate, strontium-chromate, Cadmium, mercury or mercury compounds or free crystalline silica.
   5. Human Carcinogens: Materials shall not contain any of the ACGIH-BKLT and ACGHI-DOC confirmed or suspected human carcinogens.
   6. Use high performance acrylic paints in place of alkyd paints, where possible.
   7. VOC content for solvent-based paints shall not exceed 250g/l and shall not be formulated with more than one percent aromatic hydro carbons by weight.

PART 3 - EXECUTION

3.1 JOB CONDITIONS

A. Safety: Observe required safety regulations and manufacturer's warning and instructions for storage, handling and application of painting materials.
   1. Take necessary precautions to protect personnel and property from hazards due to falls, injuries, toxic fumes, fire, explosion, or other harm.
   2. Deposit soiled cleaning rags and waste materials in metal containers approved for that purpose. Dispose of such items off the site at end of each day’s work.

B. Atmospheric and Surface Conditions:
   1. Do not apply coating when air or substrate conditions are:
      a. Less than 3 degrees C (5 degrees F) above dew point.
      b. Below 10 degrees C (50 degrees F) or over 35 degrees C (95 degrees F), unless specifically pre-approved by the Contracting Officer and the product manufacturer. Under no circumstances shall application conditions exceed manufacturer recommendations.

2. Maintain interior temperatures until paint dries hard.
3. Do no exterior painting when it is windy and dusty.
4. Do not paint in direct sunlight or on surfaces that the sun will soon warm.
5. Apply only on clean, dry and frost free surfaces except as follows:
   a. Apply water thinned acrylic and cementitious paints to damp (not wet) surfaces where allowed by manufacturer's printed instructions.
   b. Dampened with a fine mist of water on hot dry days concrete and masonry surfaces to which water thinned acrylic and cementitious paints are applied to prevent excessive suction and to cool surface.
6. Varnishing:
   a. Apply in clean areas and in still air.
   b. Before varnishing vacuum and dust area.
   c. Immediately before varnishing wipe down surfaces with a tack rag.

3.2 SURFACE PREPARATION

A. Method of surface preparation is optional, provided results of finish painting produce solid even color and texture specified with no overlays.

B. General:
   1. Remove prefinished items not to be painted such as lighting fixtures, escutcheon plates, hardware, trim, and similar items for reinstallation after paint is dried.
   2. Remove items for reinstallation and complete painting of such items and adjacent areas when item or adjacent surface is not accessible or finish is different.
   3. See other sections of specifications for specified surface conditions and prime coat.
   4. Clean surfaces for painting with materials and methods compatible with substrate and specified finish. Remove any residue remaining from cleaning agents used. Do not use solvents, acid, or steam on concrete and masonry.

C. Wood (Interior) – **Coordinate preparation procedures with Specification Section 02 83 33.13 Lead Based Paint Removal & Disposal**:
   1. Sand to a smooth even surface and then dust off.
   2. Sand surfaces showing raised grain smooth between each coat.
   3. Wipe surface with a tack rag prior to applying finish.
   4. Surface painted with an opaque finish:
      a. Coat knots, sap and pitch streaks with Knot Sealer before applying paint.
      b. Apply two coats of Knot Sealer over large knots.
   5. After application of prime or first coat of stain, fill cracks, nail and screw holes, depressions and similar defects with wood filler

paste. Sand the surface to make smooth and finish flush with adjacent surface.

6. Before applying finish coat, reapply wood filler paste if required, and sand surface to remove surface blemishes. Finish flush with adjacent surfaces.
7. Fill open grained wood such as oak, walnut, ash and mahogany with Wood Filler Paste, colored to match wood color.
   a. Thin filler in accordance with manufacturer's instructions for application.
   b. Remove excess filler, wipe as clean as possible, dry, and sand as specified.

C. Wood (Exterior):
1. Remove paint to bare wood following procedures specified in Section 02 83 33.13 LEAD BASED PAINT REMOVAL AND DISPOSAL.

D. Ferrous Metals:
1. Remove oil, grease, soil, drawing and cutting compounds, flux and other detrimental foreign matter in accordance with SSPC-SP 1 (Solvent Cleaning).
2. Remove loose mill scale, rust, and paint, by hand or power tool cleaning, as defined in SSPC-SP 2 (Hand Tool Cleaning) and SSPC-SP 3 (Power Tool Cleaning). Exception: where high temperature aluminum paint is used, prepare surface in accordance with paint manufacturer's instructions.
3. Fill dents, holes and similar voids and depressions in flat exposed surfaces of hollow steel doors and frames, access panels, roll-up steel doors and similar items specified to have semi-gloss or gloss finish with TT-F-322D (Filler, Two-Component Type, For Dents, Small Holes and Blow-Holes). Finish flush with adjacent surfaces.
   a. This includes flat head countersunk screws used for permanent anchors.
   b. Do not fill screws of item intended for removal such as glazing beads.
4. Spot prime abraded and damaged areas in shop prime coat which expose bare metal with same type of paint used for prime coat. Feather edge of spot prime to produce smooth finish coat.
5. Spot prime abraded and damaged areas which expose bare metal of factory finished items with paint as recommended by manufacturer of item.

F. Masonry, Concrete, Cement Board, Cement Plaster Parged Masonry surfaces:
1. Clean and remove dust, dirt, oil, grease efflorescence, form release agents, laitance, and other deterrents to paint adhesion.

2. Use emulsion type cleaning agents to remove oil, grease, paint and similar products. Use of solvents, acid, or steam is not permitted.
3. Remove loose mortar and/or existing loose cementitious coatings (basement) in masonry work.
4. Replace mortar and fill open joints, holes, cracks and depressions with new mortar specified in Section 04 05 13, MASONRY MORTARING. Do not fill weep holes. Finish to match adjacent surfaces.
5. Repair broken and spalled concrete edges with concrete patching compound to match adjacent surfaces as specified in CONCRETE Sections. Remove projections to level of adjacent surface by grinding or similar methods.

G. Gypsum Plaster and Gypsum Board:
1. Remove efflorescence, loose and chalking plaster or finishing materials.
2. Remove dust, dirt, and other deterrents to paint adhesion.
3. Fill holes, cracks, and other depressions with CID-A-A-1272A [Plaster, Gypsum (Spackling Compound) finished flush with adjacent surface, with texture to match texture of adjacent surface. Patch holes over 25 mm (1-inch) in diameter as specified in Section for plaster or gypsum board.

3.3 PAINT PREPARATION

A. Thoroughly mix painting materials to ensure uniformity of color, complete dispersion of pigment and uniform composition.
B. Do not thin unless necessary for application and when finish paint is used for body and prime coats. Use materials and quantities for thinning as specified in manufacturer's printed instructions.
C. Remove paint skins, then strain paint through commercial paint strainer to remove lumps and other particles.
D. Mix two component and two part paint and those requiring additives in such a manner as to uniformly blend as specified in manufacturer's printed instructions unless specified otherwise.
E. For tinting required to produce exact shades specified, use color pigment recommended by the paint manufacturer.

3.4 APPLICATION

A. Start of surface preparation or painting will be construed as acceptance of the surface as satisfactory for the application of materials.
B. Unless otherwise specified, apply paint in three coats; prime, body, and finish. When two coats applied to prime coat are the same, first coat applied over primer is body coat and second coat is finish coat.
C. Apply each coat evenly and cover substrate completely.

D. Allow not less than 48 hours between application of succeeding coats, except as allowed by manufacturer's printed instructions, and approved by RE/COTR.
E. Finish surfaces to show solid even color, free from runs, lumps, brushmarks, laps, holidays, or other defects.
F. Apply by brush or roller, except as otherwise specified.
G. Do not spray paint in existing occupied spaces unless approved by RE/COTR, except in spaces sealed from existing occupied spaces.
   1. Apply painting materials specifically required by manufacturer to be applied by spraying.
   2. In areas, where paint is applied by spray, mask or enclose with polyethylene, or similar air tight material with edges and seams continuously sealed including items specified in WORK NOT PAINTED, motors, controls, telephone, and electrical equipment, fronts of sterilizes and other recessed equipment and similar prefinished items.
I. Do not paint in closed position operable items such as access doors and panels, window sashes, overhead doors, and similar items except overhead roll-up doors and shutters.

3.5 PRIME PAINTING

A. After surface preparation, prime surfaces before application of body and finish coats, except as otherwise specified.
B. Spot prime and apply body coat to damaged and abraded painted surfaces before applying succeeding coats.
C. Additional field applied prime coats over shop or factory applied prime coats are not required.
D. Prime rebates for stop and face glazing of wood, and for face glazing of steel.
E. Wood and Wood Particleboard:
   1. Use same kind of primer specified for exposed face surface.
      a. Exterior wood: MPI 7 (Exterior Oil Wood Primer) for new construction and MPI 5(Exterior Alkyd Wood Primer) for repainting bare wood primer. Back-prime and seal ends of exterior woodwork and edges of exterior plywood specified to be finished.
      b. Interior wood except for transparent finish: MPI 45 (Interior Primer Sealer) or MPI 46 (Interior Enamel Undercoat), thinned if recommended by manufacturer.
      c. Transparent finishes as specified under Transparent Finishes on Wood.
F. Metals:
   1. Steel and iron: MPI 95 (Fast Drying Metal Primer).
   2. Terne Metal: MPI 95 (Fast Drying Metal Primer).

G. Gypsum Plaster and Veneer Plaster:
   1. MPI 45 (Interior Primer Sealer), except use MPI 50 (Interior Latex Primer Sealer) when an alkyd flat finish is specified.
   2. Surfaces scheduled to have MPI 53 (Interior Latex, Flat, MPI Gloss Level 1 LE)), MPI 52 (Interior Latex, MPI Gloss Level 3 (LE)), MPI 114 (Interior Latex, Gloss (LE) and (LG)) finish: Use MPI 53 (Interior Latex, Flat, MPI Gloss Level 1 LE)), MPI 52 Latex, MPI Gloss Level 3 (LE)), MPI 114 (Interior Latex, Gloss (LE) and (LG)), respectively.

3.6 EXTERIOR FINISHES

A. Apply following finish coats where specified in Section 09 06 00, SCHEDULE FOR FINISHES.
B. Steel and Ferrous Metal (including metal window grates), Including Tern:
   1. Two coats of MPI 94 (Exterior Alkyd, Semi-Gloss (EO)) on exposed surfaces, except on surfaces over 94 degrees C (200 degrees F).
C. Wood:
   1. Two coats of MPI 9 (Exterior Alkyd Enamel (EO).

3.7 INTERIOR FINISHES

A. Apply following finish coats over prime coats in spaces or on surfaces specified in Section 09 06 00, SCHEDULE FOR FINISHES.
B. Gypsum Board / Plaster:
   1. One coat of MPI 45 (Interior Primer Sealer) or MPI 50 (Interior Latex Primer Sealer).
   2. Two coats of Interior Latex, MPI Gloss Level 3 (LE): MPI 52 or Interior Latex, Flat, MPI Gloss level 1 (LE): MPI 53
C. Parged Masonry Walls scheduled to receive new cementitious coating:
   1. Apply coating with manufacturer recommend brush or broom or equivalent stiff fiber brush or by textured spray equipment. Spray, back-brush, or broom applications of first coat to fill voids and achieve uniformity.
   2. Completely dampen substrate with water before starting application. Do not saturate substrate. Keep substrate cool and damp throughout application.
   3. Work first coat thoroughly into substrate to completely fill and cover voids, holes, and nonmoving cracks.
   4. Total: 3 pounds per square yard (1.6 kg/sm), cured nominal thickness of 1/16 inch (1.6 mm).
D. Wood (coordinate with specification section 02 83 33.13 Lead Based Paint Removal and Disposal:
   1. Sanding:
      a. Use 220-grit sandpaper.
      b. Sand sealers and varnish between coats.

c. Sand enough to scarify surface to assure good adhesion of subsequent coats, to level roughly applied sealer and varnish, and to knock off "whiskers" of any raised grain as well as dust particles.

2. Sealers:
   a. Apply sealers specified except sealer may be omitted where pigmented, penetrating, or wiping stains containing resins are used.
   b. Allow manufacturer's recommended drying time before sanding, but not less than 24 hours or 36 hours in damp or muggy weather.
   c. Sand as specified.
3. Paint Finish:
   a. One coat of MPI 45 (Interior Primer Sealer).
   c. Two coats of MPI 119 (Interior Latex, Gloss (LE) and (LG)).

3.8 REFINISHING EXISTING PAINTED SURFACES

A. Clean, patch and repair existing surfaces as specified under surface preparation.
B. Remove and reinstall items as specified under surface preparation.
C. Remove existing finishes or apply separation coats to prevent non compatible coatings from having contact.
D. Patched or Replaced Areas in Surfaces and Components: Apply spot prime and body coats as specified for new work to repaired areas or replaced components.
E. Except where scheduled for complete painting apply finish coat over plane surface to nearest break in plane, such as corner, reveal, or frame.
F. Refinish areas as specified for new work to match adjoining work unless specified or scheduled otherwise.
G. Coat knots and pitch streaks showing through old finish with Knot Sealer before refinishing.
H. Sand or dull glossy surfaces prior to painting.
I. Sand existing coatings to a feather edge so that transition between new and existing finish will not show in finished work.

3.9 PAINT COLOR

A. Color and gloss of finish coats is specified in Section 09 06 00, SCHEDULE FOR FINISHES.
B. Coat Colors:
   1. Color of priming coat: Lighter than body coat.
   2. Color of body coat: Lighter than finish coat.
   3. Color prime and body coats to not show through the finish coat and to mask surface imperfections or contrasts.

3.10 MECHANICAL AND ELECTRICAL WORK FIELD PAINTING SCHEDULE

A. Field painting of mechanical and electrical consists of cleaning, touching-up abraded shop prime coats, and applying prime, body and finish

coats to materials and equipment if not factory finished in space scheduled to be finished.

B. In spaces not scheduled to be finish painted in Section 09050, MATERIALS AND FINISH SCHEDULES paint as specified under paragraph H, colors.

C. Paint after tests have been completed.

D. Omit prime coat from factory prime-coated items.

E. Finish painting of mechanical and electrical equipment is not required when located in interstitial spaces, above suspended ceilings, in concealed areas such as pipe and electric closets, pipe basements, pipe tunnels, trenches, attics, roof spaces, shafts and furred spaces except on electrical conduit containing feeders 600 volts or more.

F. Color:

1. Paint items having no color specified in Section 09050, MATERIALS AND FINISH SCHEDULES to match surrounding surfaces as approved by Architect.

2. Paint colors as specified in Section 09050, INTERIOR EXTERIOR FINISHES, MATERIALS AND FINISH SCHEDULES except for following:

a. White .....Exterior unfinished surfaces of enameled plumbing fixtures. Insulation coverings on breeching and uptake inside boiler house, drums and drum-heads, oil heaters, condensate tanks and condensate piping.

b. Gray: .....Heating, ventilating, air conditioning and refrigeration equipment (except as required to match surrounding surfaces), and water and sewage treatment equipment and sewage ejection equipment.

c. Aluminum Color: Ferrous metal on outside of boilers and in connection with boiler settings including supporting doors and door frames and fuel oil burning equipment, and steam generation system (bare piping, fittings, hangers, supports, valves, traps and miscellaneous iron work in contact with pipe).

d. Federal Safety Red: Exposed fire protection piping hydrants, post indicators, electrical conducts containing fire alarm control wiring, and fire alarm equipment.

e. Federal Safety Orange: .Entire lengths of electrical conduits containing feeders 600 volts or more.

f. Color to match brickwork sheet metal covering on breeching outside of exterior wall of boiler house.

I. Apply paint systems on properly prepared and primed surface as follows:

1. Exterior Locations:

a. Apply two coats of [MPI 10 Exterior Latex, Flat (AE), MPI 11 Exterior Latex, Semi Gloss (AE), MPI 119 (Exterior Latex, High Gloss

(acrylic) (AE)] as required to match existing to the following metal items:

Galvanized and zinc-copper alloy metal specifically indicated to be painted.

3.11 PROTECTION CLEAN UP, AND TOUCH-UP

A. Protect work from paint droppings and spattering by use of masking, drop cloths, removal of items or by other approved methods.

B. Upon completion, clean paint from hardware, glass and other surfaces and items not required to be painted of paint drops or smears.

C. Before final inspection, touch-up or refinished in a manner to produce solid even color and finish texture, free from defects in work which was damaged or discolored.

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SECTION 26 41 00
FACILITY LIGHTNING PROTECTION

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section specifies the furnishing and installation of a complete master labeled lightning protection system, complying with NFPA 780, UL 96 and UL 96A.

1.2 RELATED WORK

A. Section 07 41 13 CUSTOM METAL ROOFING

B. Section 07 60 00, FLASHING AND SHEET METAL: penetrations through the roof.

C. Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS: General electrical requirements that are common to more than one section of Division 26.

D. Section 26 05 26, GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS: Requirements for personnel safety and to provide a low impedance path to ground for possible ground faults.

1.3 QUALITY ASSURANCE

Refer to Paragraph, QUALIFICATIONS, in Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS.

1.4 SUBMITTALS

A. In accordance with Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS, submit the following:

B. Shop Drawings:

1. Isometric and plan views showing layout and connections to the required metal surfaces.
2. Show the methods of mounting the system to the adjacent construction.

C. Qualifications: Submit proof that the installer of the lightning protection system is a certified Lighting Protection Institute (LPI) installer, and has had suitable and adequate experience installing other lightning protection systems, and is capable of installing the system as recommended by the manufacturer of the equipment.

D. Certification: Two weeks prior to final inspection, submit four copies of the following certifications to the Resident Engineer/COTR:

1. Certification that the lightning protection system has been properly installed and tested.
2. Certification that the lightning protection system has been inspected by a UL representative and has been approved by UL without variation.

1.5 APPLICABLE PUBLICATIONS

A. Publications listed below (including amendments, addenda, revisions, supplements, and errata) form a part of this specification to the extent referenced. Publications are referenced in the text by designation only.

B. National Fire Protection Association (NFPA):

70-08.....National Electrical Code (NEC)

780-00.....Standard for the Installation of Lightning Protection Systems

C. Underwriters Laboratories, Inc. (UL):

96-94.....Lightning Protection Components

96A-02.....Installation Requirements for Lightning Protection Systems

UL 467-07 .....Standard for Grounding and Bonding Equipment

PART 2 - PRODUCTS

2.1 MATERIALS

A. Attach master labels to each item by its manufacturer as evidence that the materials have been manufactured in conformance with the UL Standards for master label lightning protection materials.

B. In additional to conformance to UL 96, the component material requirements are as follows:

1. Conductors: Electrical grade copper. Conductors shall be in accordance with NFPA 780 and UL 96 for Class I, Class II, or Class II modified materials as applicable.
2. Air terminals: Solid copper, 457 mm (18 inches) long, not less than 9mm (3/8 inch)diameter, with sharp nickel-plated points.
3. Ground rods: Copper clad steel, not less than 1/2 inch diameter by 8 fee) long. Rods made of copper-clad steel shall conform to UL 467 and galvanized ferrous rods shall conform to IEEE C135.30. Ground rods of copper-clad steel, steel, stainless steel, galvanized ferrous, and solid copper shall not be mixed on the project.
4. Ground plates: Solid copper, not less than 1/16 inch thick.
5. Tubing: Stiff copper or brass.

C. Anchors and fasteners: Bolt type which are most suitable for the specific anchor and fastener installations. Clamp-type connectors for splicing conductors shall conform to UL 96, class as applicable, and, Class 2, style and size as required for the installation. Clamp-type connectors shall only be used for the connection of the roof conductor to the air terminal and to the guttering. All other connections, bonds, and splices shall be done by exothermic welds or by high compression fittings. The exothermic welds and high compression fittings shall be listed for the purpose. The high compression fittings shall be the type

which require a hydraulically operated mechanism to apply a minimum of 10,000 psi.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Installation shall be coordinated with the roofing manufacturer and installer.

B. Install the conductors as inconspicuously as practical and with the proper bends.

C. Install the vertical conductors within the concealed cavity of exterior walls. Run the conductors to the exterior at elevations below the finished grade and make the ground connections to the earth outside of the building.

D. Make connections of dissimilar metal with bimetallic type fittings to prevent electrolytic action.

E. Use the exothermic welding type connections that form solid metal joints in the main vertical and horizontal conductors, and for connections that are not exposed in the finish work.

F. Protect copper conductors with stiff copper or brass tubing, which enclose the conductors from the top to the bottom of the tubing, between 300mm (1 foot) below and 2100mm (7 feet) above the finished grade. The conductor shall be bonded to the top and bottom of the tubing.

G. Sheath copper conductors, which pass over cast stone, cut stone, architectural concrete and masonry surfaces, with not less than a 2mm (1/16 inch) thickness of lead to prevent staining of the exterior finish surfaces.

H. For the earth connections, install ground rods and ground plates, and the conductor connections to them and the main water pipes in the presence of the Resident Engineer/COTR. For the conductors located outside of the building, install the conductors not less than 600mm (2 feet) below the finished grade.

I. Connect lightning protection cables to all metallic projections, equipment, and components above the roof.

J. Connect exterior metal surfaces, located within 900mm (3 feet) of the lightning protection system conductors, to the lightning protection system conductors to prevent flashovers.

K. Maintain horizontal or downward coursing of main conductor and insure that all bends have at least a 203 mm (8-inch) radius and do not exceed 90 degrees.

L. Conductors shall be rigidly fastened every 900mm (3 feet) along the roof and down to the building to ground.

M. Air terminals shall be secured against overturning either by attachment to the object to be protected or by means of a substantial tripod or other braces permanently and rigidly attached to the building or structure. Install air terminal bases, cable holders and other roof-system supporting means without piercing roof metal.

N. Use through-roof connectors for down-conductor attachment to roof system. Provide flashing in accordance with Section 07 60 00, FLASHING AND SHEET METAL.

O. A counterpoise, where shown, shall be of No. 1/0 copper cable or equivalent material having suitable resistance to corrosion and shall be laid around the perimeter of the structure in a trench not less than 600mm (2 feet) deep at a distance not less than 900mm (3 feet) nor more than 2.5m (8 feet) from the nearest point of the structure.

P. Grounding: Test the ground resistance to earth by standard methods and conform to the ground resistance requirements specified in Section 26 05 26, GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS.

Q. When the lightning protection systems have been installed, have the systems inspected by a UL representative. Obtain and install a UL numbered master label for each of the lightning protection systems at the location directed by the UL representative and the Resident

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SECTION 32 05 23
CEMENT AND CONCRETE FOR EXTERIOR IMPROVEMENTS

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section shall cover site work concrete constructed upon the prepared subgrade and in conformance with the lines, grades, thickness, and cross sections shown. Construction shall include the following:

B. Pedestrian Pavement: Walks

C. Equipment Pads: Condensing Pads

1.2 DESIGN REQUIREMENTS

Design all elements with the latest published version of applicable codes.

1.3 SUBMITTALS

A. In accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES, furnish the following:

B. Manufacturers' Certificates and Data certifying that the following materials conform to the requirements specified.

1. Expansion joint filler
2. Reinforcement
3. Curing materials

C. Data and Test Reports: Select subbase material.

1. Job-mix formula.
2. Source, gradation, liquid limit, plasticity index, percentage of wear, and other tests as specified and in referenced publications.

1.4 APPLICABLE PUBLICATIONS

A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only. Refer to the latest edition of all referenced Standards and codes.

B. American Association of State Highway and Transportation Officials (AASHTO):

M31-07.....Deformed and Plain Billet Steel Bars for Concrete Reinforcement (ASTM A615/A615M-96A)

M55M/55M-09.....Welded Steel Wire Fabric for Concrete Reinforcement (ASTM A185)

M147-04.....Materials for Aggregate and Soil-Aggregate Subbase, Base and Surface Courses (R 1996)

M148-05.....Liquid Membrane-Forming Compounds for Curing Concrete (ASTM C309A)

M171-05.....Sheet Materials for Curing Concrete (ASTM C171
M182-05.....Burlap Cloth Made from Jute or Kenaf
M213-05.....Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Type) (ASTM D1751)
T99-09.....Moisture-Density Relations of Soils Using a 2.5 kg. (5.5 lb) Rammer and a 305 mm (12 in.) Drop
T180-09.....Moisture-Density Relations of Soils Using a 4.54 kg (10 lb.) Rammer and a 457 mm (18 in.) Drop

C. American Society for Testing and Materials (ASTM):
C94/C94M-09.....Ready-Mixed Concrete
C143/C143M-08.....Slump of Hydraulic Cement Concrete

PART 2 - PRODUCTS

2.1 GENERAL

Concrete shall be Type C, air-entrained as specified in Section 03 30 53, SHORT FORM CAST-IN-PLACE CONCRETE, with the following exceptions:

TYPE	MAXIMUM SLUMP*
Pedestrian Pavement	75 mm (3")
Equipment Pad	75 to 100 mm (3" to 4")
* For concrete to be vibrated: Slump as determined by ASTM C143. Tolerances as established by ASTM C94.	

2.2 REINFORCEMENT

A. The type, amount, and locations of steel reinforcement shall be as shown on the drawings and in the specifications.
B. Welded wire-fabric shall conform to AASHTO M55.
C. Dowels shall be plain steel bars conforming to AASHTO M31 or M42. Tie bars shall be deformed steel bars conforming to AASHTO M31 or M42.
D. Fiber Reinforcement-Polypropylene fibers designed for use in concrete pavement ASTM C1116 Type III 13 to 38 mm (1/2 to 1 1/2 inches) long. Use 2.27 Kg (5lbs) per .76 M^3 (1 cubic yard) of concrete in batch.

2.3 SELECT SUBBASE (WHERE REQUIRED)

A. Subbase material shall consist of select granular material composed of sand, sand-gravel, crushed stone, crushed or granulated slag, with or without soil binder, or combinations of these materials conforming to AASHTO M147, Grading E or F.

B. Materials meeting other gradations than that noted will be acceptable whenever the gradations are within a tolerance of three to five percent, plus or minus, of the single gradation established by the job-mix formula.

C. Subbase material shall produce a compacted, dense-graded course, meeting the density requirement specified herein.

2.4 FORMS

A. Use metal or wood forms that are straight and suitable in cross-section, depth, and strength to resist springing during depositing and consolidating the concrete, for the work involved.

B. Do not use forms if they vary from a straight line more than 3 mm (1/8 inch) in any 3000 mm (ten foot) long section, in either a horizontal or vertical direction.

C. Wood forms should be at least 50 mm (2 inches) thick (nominal). Wood forms shall also be free from warp, twist, loose knots, splits, or other defects. Use approved flexible or curved forms for forming radii.

2.5 CONCRETE CURING MATERIALS

A. Concrete curing materials shall conform to one of the following:

1. Burlap conforming to AASHTO M182 having a weight of 233 grams (seven ounces) or more per square meter (yard) when dry.
2. Impervious Sheeting conforming to AASHTO M171.

2.6 EXPANSION JOINT FILLERS

Material shall conform to AASHTO M213.

PART 3 - EXECUTION

3.1 SUBGRADE PENETRATION

A. Prepare, construct, and finish the subgrade as required.

B. Maintain the subgrade in a smooth, compacted condition, in conformance with the required section and established grade until the succeeding operation has been accomplished.

3.2 SELECT SUBBASE (WHERE REQUIRED)

A. Mixing: Proportion the select subbase by weight or by volume in quantities so that the final approved job-mixed formula gradation, liquid limit, and plasticity index requirements will be met after subbase course has been placed and compacted. Add water in approved quantities, measured by weight or volume, in such a manner to produce a uniform blend.

B. Placing:

1. Place the mixed material on the prepared subgrade in a uniform layer to the required contour and grades, and to a loose depth not to

exceed 8 inches, and that when compacted, will produce a layer of the designated thickness.

3. In no case will the addition of thin layers of material be added to the top layer in order to meet grade.
4. If the elevation of the top layer is 1/2 inch or more below the grade, excavate the top layer and replace with new material to a depth of at least 3 inches in compacted thickness.

C. Compaction:

1. Perform compaction with approved equipment (hand or mechanical) well suited to the material being compacted.
2. Moisten or aerate the material as necessary to provide the moisture content that will readily facilitate obtaining the specified compaction with the equipment used.
3. Compact each layer to at least 95 percent or 100 percent of maximum density as determined by AASHTO T180 or AASHTO T99 respectively.

D. Smoothness Test and Thickness Control:

Test the completed subbase for grade and cross section with a straight edge.

1. The surface of each layer shall not show any deviations in excess of 10 mm (3/8 inch).
2. The completed thickness shall be within 13 mm (1/2 inch) of the thickness as shown.

E. Protection:

1. Maintain the finished subbase in a smooth and compacted condition until the concrete has been placed.
2. When Contractor's subsequent operations or adverse weather disturbs the approved compacted subbase, excavate, and reconstruct it with new material meeting the requirements herein specified, at no additional cost to the VA.

3.3 SETTING FORMS

A. Base Support:

1. Compact the base material under the forms true to grade so that, when set, they will be uniformly supported for their entire length at the grade as shown.
2. Correct imperfections or variations in the base material grade by cutting or filling and compacting.

B. Form Setting:

1. Set forms sufficiently in advance of the placing of the concrete to permit the performance and approval of all operations required with and adjacent to the form lines.

2. Set forms to true line and grade and use stakes, clamps, spreaders, and braces to hold them rigidly in place so that the forms and joints are free from play or movement in any direction.
3. Forms shall conform to line and grade with an allowable tolerance of 3 mm (1/8 inch) when checked with a straightedge and shall not deviate from true line by more than 6 mm (1/4 inch) at any point.
4. Do not remove forms until removal will not result in damaged concrete or at such time to facilitate finishing.
5. Clean and oil forms each time they are used.

3.4 EQUIPMENT

A. The Resident Engineer shall approve equipment and tools necessary for handling materials and performing all parts of the work prior to commencement of work.

B. Maintain equipment and tools in satisfactory working condition at all times.

3.5 PLACING REINFORCEMENT

A. Reinforcement shall be free from dirt, oil, rust, scale or other substances that prevent the bonding of the concrete to the reinforcement.

B. Before the concrete is placed, the Resident Engineer shall approve the reinforcement, which shall be accurately and securely fastened in place with suitable supports and ties. The type, amount, and position of the reinforcement shall be as shown.

3.7 PLACING CONCRETE - GENERAL

A. Obtain approval of the Resident Engineer before placing concrete.

B. Remove debris and other foreign material from between the forms before placing concrete. Obtain approval of the Resident Engineer before placing concrete.

C. Before the concrete is placed, uniformly moisten the subgrade, base, or subbase appropriately, avoiding puddles of water.

D. Convey concrete from mixer to final place of deposit by a method which will prevent segregation or loss of ingredients. Deposit concrete so that it requires as little handling as possible.

E. While being placed, spade or vibrate and compact the concrete with suitable tools to prevent the formation of voids or honeycomb pockets. Vibrate concrete well against forms and along joints. Over-vibration or manipulation causing segregation will not be permitted. Place concrete continuously between joints without bulkheads.

F. Install a construction joint whenever the placing of concrete is suspended for more than 30 minutes and at the end of each day's work.

G. Workmen or construction equipment coated with foreign material shall not be permitted to walk or operate in the concrete during placement and finishing operations.

3.8 PLACING CONCRETE FOR PEDESTRIAN PAVEMENTS, AND EQUIPMENT PADS

A. Place concrete in the forms in one layer of such thickness that, when compacted and finished, it will conform to the cross section as shown.
B. Deposit concrete as near to joints as possible without disturbing them but do not dump onto a joint assembly.
C. After the concrete has been placed in the forms, use a strike-off guided by the side forms to bring the surface to the proper section to be compacted.
D. Consolidate the concrete thoroughly by tamping and spading, or with approved mechanical finishing equipment.
E. Finish the surface to grade with a wood or metal float.
F. All Concrete pads and pavements shall be constructed with sufficient slope to drain properly.

3.10 CONCRETE FINISHING - GENERAL

A. The sequence of operations, unless otherwise indicated, shall be as follows:
   1. Consolidating, floating, straight-edging, troweling, texturing, and edging of joints.
   2. Maintain finishing equipment and tools in a clean and approved condition.

3.12 CONCRETE FINISHING PEDESTRIAN PAVEMENT

A. Walks:
   1. Finish the surfaces to grade and cross section with a metal float, trowled smooth and finished with a broom moistened with clear water.
   2. Brooming shall be transverse to the line of traffic.
   3. Finish all slab edges, including those at formed joints, carefully with an edger having a radius as shown on the Drawings.
   4. Unless otherwise indicated, edge the transverse joints before brooming. The brooming shall eliminate the flat surface left by the surface face of the edger. Execute the brooming so that the corrugation, thus produced, will be uniform in appearance and not more than 2 mm (1/16 inch) in depth.
   5. The completed surface shall be uniform in color and free of surface blemishes, form marks, and tool marks. The finished surface of the pavement shall not vary more than 5 mm (3/16 inch) when tested with a 3000 mm (10 foot) straightedge.
   6. The thickness of the pavement shall not vary more than 1/4 inch.

7. Remove and reconstruct irregularities exceeding the above for the full length between regularly scheduled joints.

3.14 CONCRETE FINISHING EQUIPMENT PADS

A. After the surface has been struck off and screeded to the proper elevation, give it a smooth dense float finish, free from depressions or irregularities.
B. Carefully finish all slab edges with an edger having a radius as shown in the Drawings.
C. After removing the forms, rub the faces of the pad with a wood or concrete rubbing block and water until blemishes, form marks, and tool marks have been removed. The finish surface of the pad shall not vary more than 1/8 inch when tested with a 10 foot straightedge.
D. Correct irregularities exceeding the above.

3.15 JOINTS - GENERAL

A. Place joints, where shown, conforming to the details as shown, and perpendicular to the finished grade of the concrete surface.
B. Joints shall be straight and continuous from edge to edge of the pavement.

3.16 CONTRACTION JOINTS

A. Cut joints to depth as shown with a grooving tool or jointer of a radius as shown or by sawing with a blade producing the required width and depth.
B. Plates shall remain in place until concrete has set sufficiently to hold its shape and shall then be removed.
D. Finish edges of all joints with an edging tool having the radius as shown.
E. Score pedestrian pavement with a standard grooving tool or jointer.

3.17 EXPANSION JOINTS

A. Use a preformed expansion joint filler material of the thickness as shown to form expansion joints.
B. Material shall extend the full depth of concrete, cut and shaped to the cross section as shown, except that top edges of joint filler shall be below the finished concrete surface where shown to allow for sealing.
C. Anchor with approved devices to prevent displacing during placing and finishing operations.
D. Round the edges of joints with an edging tool.
E. Form expansion joints as follows:
   1. Without dowels, about structures and features that project through, into, or against any site work concrete construction.
   2. Using joint filler of the type, thickness, and width as required.

3. Installed in such a manner as to form a complete, uniform separation between the structure and the site work concrete item.

3.18 CONSTRUCTION JOINTS

A. Place transverse construction joints of the type shown, where indicated and whenever the placing of concrete is suspended for more than 30 minutes.

3.19 FORM REMOVAL

A. Forms shall remain in place at least 12 hours after the concrete has been placed. Remove forms without injuring the concrete.

B. Do not use bars or heavy tools against the concrete in removing the forms. Promptly repair any concrete found defective after form removal.

3.20 CURING OF CONCRETE

A. Cure concrete by one of the following methods appropriate to the weather conditions and local construction practices, against loss of moisture, and rapid temperature changes for at least seven days from the beginning of the curing operation. Protect unhardened concrete from rain and flowing water. All equipment needed for adequate curing and protection of the concrete shall be on hand and ready to install before actual concrete placement begins. Provide protection as necessary to prevent cracking of the pavement due to temperature changes during the curing period. If any selected method of curing does not afford the proper curing and protection against concrete cracking, remove and replace the damaged pavement and employ another method of curing as directed by the Resident Engineer.

B. Burlap Mat: Provide a minimum of two layers kept saturated with water for the curing period. Mats shall overlap each other at least 150 mm (6 inches).

C. Impervious Sheeting: Use waterproof paper, polyethylene-coated burlap, or polyethylene sheeting. Polyethylene shall be at lease 4 mils in thickness. Wet the entire exposed concrete surface with a fine spray of water and then cover with the sheeting material. Sheets shall overlap each other at least 12 inches. Securely anchor sheeting.

3.21 CLEANING

A. After completion of the curing period:
   1. Remove the curing material.
   2. Sweep the concrete clean.
   3. After removal of all foreign matter from the joints, seal joints as herein specified.
   4. Clean the entire concrete of all debris and construction equipment as soon as curing and sealing of joints has been completed.

3.22 PROTECTION

The contractor shall protect the concrete against all damage prior to final acceptance by the Government. Remove concrete containing excessive cracking, fractures, spalling, or other defects and reconstruct the entire section between regularly scheduled joints, when directed by the Resident Engineer, and at no additional cost to the Government. Exclude traffic from vehicular pavement until the concrete is at least seven days old, or for a longer period of time if so directed by the Resident Engineer.

3.23 FINAL CLEAN-UP

Remove all debris, rubbish and excess material from the Station.

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SECTION 33 46 13
STORM DRAINAGE

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section specifies underground storm drainage and foundation drainage systems, including installation, backfill, and cleanout extensions, to point of discharge.

1.2 SUBMITTALS

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Product Data: Certifications from the manufacturers attesting that materials meet specification requirements.

1.3 RELATED WORK

A. Safety requirements: Section 00 72 00, GENERAL CONDITIONS, Article, ACCIDENT PREVENTION.

B. Protection of existing utilities, fire protection services, existing equipment, roads, and pavements: Section 01 00 00, GENERAL REQUIREMENTS.

1.4 APPLICABLE PUBLICATIONS

A. The publications listed below form a part of this specification to the extent referenced. The publications are referred in the text by basic designation only.

B. American Association of State Highway and Transportation Officials (AASHTO):

M006-08-UL.....Standard Specification for Fine Aggregate for Hydraulic Cement Concrete, Single User Digital Publication

M252-08-UL.....Corrugated Polyethylene Drainage Pipe

M288-06-UL.....Geotextile Specification for Highway Applications

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

D448-08.....Standard Classification for Sizes of Aggregate for Road and Bridge Construction

D2321-08.....Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications

D2751-(2005).....Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Sewer Pipe and Fittings

D2729-03.....Standard Specification for Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings

D2737-03.....Standard Specification for Polyethylene (PE) Plastic Tubing

D3034-08.....Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings

D4216-06.....Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) and Related PVC and Chlorinated Poly (Vinyl Chloride) (CPVC) Building Products Compounds

F477-08.....Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe

F758-95(2000)e1 .....Standard Specification for Smooth-Wall Poly (Vinyl Chloride)(PVC)Plastic Underdrain Systems for Highway, Airport, and Similar Drainage.

F949-(2006a).....Poly(Vinyl Chloride) (PVC) Corrugated Sewer Pipe with a Smooth Interior and Fittings

PART 2 - PRODUCTS

2.1 MATERIALS

Pipe for foundation drainage system shall be of the type and size indicated. Appropriate transitions, adapters, or joint details shall be used where pipes of different types or materials are connected.

A. Underslab Header:

1. ASTM A74 or ASTM A746 cast-iron soil pipe and fittings in DN 100 to DN 375 (NPS 4 to NPS 15). Joints shall be hub-and-spigot, gasket type.
2. PE drainage tubing and fittings per ASTM D2737, in DN 100 to DN 250 (NPS 4 to NPS 10). Joints shall be coupling type.
3. PE pipe and fittings per ASTM D2737, in DN 300 to DN 900 (NPS 12 to NPS 36). Joints shall be coupling type.
4. PVC sewer pipe and fittings per ASTM D3034, in DN 100 to DN 375 (NPS 4 to NPS 15). Joints shall be bell-and-spigot. ASTM F477, elastomeric seal gaskets shall be used.

B. Perforated Drainage Pipe:

1. Perforated, PE pipe and fittings per ASTM D2737, in DN 100 to DN 150 (NPS 4 to NPS 6). Joints shall be coupling type.
2. Perforated, PE pipe and fittings per ASTM D2737, in DN 200 to DN 600 (NPS 8 to NPS 24). Joints shall be coupling type.
3. Perforated, PVC sewer pipe and fittings per ASTM D2729, in DN 100 (NPS 4) only. Joints shall be bell-and-spigot, loose type.

C. Cleanout Extension: ASTM A74, cast iron pipe or ASTM A746 ductile iron. Gravity Sewer pipes shall have a neoprene gasket joints and long sweep elbow fittings. Cleanouts for pre-placed crypt field underdrains shall be as indicated on the drawings and shall be set so as to not interfere with mowing operations. Plastic tops for the crypt field cleanouts shall be provided with concrete anchorage with all features set so as to not cause damage to the mowers.

D. Drainage Conduit:
1. Pipe, fittings, and couplings shall be perforated and smooth PVC complying with ASTM D4216 and ASTM D2729.
2. Pipe size shall be 200 mm (8 inches) and have a high minimum flow rate equal to a DN 100 (NPS 4) pipe.
3. Fittings shall be PVC with DN 100 (NPS 4) outlet connection.
4. Couplings shall be PVC.

E. Filter Fabric

Filter fabric shall be a pervious sheet of polyester, nylon, or polypropylene filaments woven or otherwise formed into a uniform pattern with distinct and measurable openings. The filter fabric shall provide an equivalent opening size (AOS) no finer than the US Standard Sieve No. [_____] and no coarser than the US Standard Sieve No. [_____]. AOS is defined as the number of the US Standard sieve having openings closest in size to the filter fabric openings. [The percent open area provided shall not be less than [_____] percent and not more than [_____] percent. Percent open area is defined as the summation of open areas divided by the total area of the filter fabric and expressed as a percent.] [The filaments shall consist of a long-chain synthetic polymer composed of at least 85 percent by weight of propylene, ethylene, or vinylidene-chloride, and shall contain stabilizers and/or inhibitors added to the base plastic to make the filaments resistant to deterioration due to ultraviolet and heat exposure.] The fabric shall have a minimum physical strength of [_____] pounds per inch in any direction when tested in accordance with ASTM D 5034 using the grab

test method with 1 square inch jaws and a constant rate of travel of 12 inches per minute. Elongation at failure shall be between [30] [_____] and [70] [_____] percent. The fabric shall be constructed so that the filaments will retain their relative position with respect to each other. [The edges of the fabric shall be selvaged or otherwise finished to prevent the outer material from pulling away from the fabric.] [The fabric shall be woven into a width that may be installed as shown without longitudinal seams.]

F. Drainage Material:

1. Bedding: Crushed stone, 20 mm (3/4 inch) to 25 mm (No. 4) per ASTM D448.
2. Fill to 300 mm (1 foot) above pipe: Crushed stone, 20 mm (3/4 inch) to 25 mm (No. 4) per ASTM D448.

G. Concrete Sand: AASHTO M006.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Trenching and Excavation

Perform required trenching and excavation in accordance with Section 31 00 00 EARTHWORK. Keep trenches dry during installation of drainage system. Changes in direction of drain lines shall be made with 1/8 bends. Use wye fittings at intersections.

B. Bedding

Place graded bedding, minimum 6 inches in depth, in the bottom of trench for its full width and length compacted as specified prior to laying of foundation drain pipe. Each section shall rest firmly upon the bedding, through the entire length, with recesses formed for bell joints. Except for recesses for bell joints, the bedding shall fully support the lower quadrant of the pipe.

C. Pipe Laying

1. Lay drain lines to true grades and alignment with a continuous fall in the direction of flow. Bells of pipe sections shall face upgrade. Clean interior of pipe thoroughly before being laid. When drain lines are left open for connection to discharge lines, the open ends shall be temporarily closed and the location marked with wooden stakes. Perforated pipe shall be laid with perforations facing down. Any length that has had its grade or joints disturbed shall be removed and relaid at no additional cost to the Government. Perforated corrugated polyethylene drainage tubing and plastic

piping shall be installed in accordance with manufacturer's specifications and as specified herein. Tubing and piping with physical imperfections shall not be installed.

2. Prior to installation of bedding materials or piping, examination of excavation and subgrades are to be observed by the Resident Engineer. Invert elevation of drain pipe shall not be higher than top of lowest floor elevation nor lower than a 45 degree line projected from bottom of any adjacent footing. Lay drain lines and firmly bed in granular material a minimum of 75 mm (3 inches) below invert to top of pipe to true grades and alignment with bells facing upgrade, and to slope uniformly between elevations shown on foundation drainage drawings. Keep trenches dry until pipe is in place and granular material backfill is completed to 300 mm (1 foot) above top of pipe, unless otherwise noted.
3. Install gaskets, seals, sleeves, and couplings according to manufacturers written instructions and per the applicable standard:
   a. PE and PVC pipe installation shall be per ASTM D2321 and ASTM F758.
   b. PE joint construction shall be per ASTM D2737 and AASHTO HB17, Division II, Section 26.4.2.4, “Joint Properties.”
   c. PVC joint construction shall be per ASTM D3034 with elastomeric seals gaskets per ASTM D2321.
   d. Perforated PVC joint construction shall be per ASTM D2729, with loose bell and spigot joints.
4. Lay perforated pipe with perforations down. Lay plain end pipe with closed joints held in place with two No. 9 spring steel wire clips at each joint or by standard clay collars.
5. For foundation subdrainage, install piping pitched down in direction of flow, at a minimum slope of 0.5 percent and with a minimum cover of 900 mm (3 feet), unless otherwise indicated.
6. For underslab subdrainage, install piping pitched down in direction of flow, at a minimum slope of 0.5 percent.
7. Install cleanout extensions where shown on the Contract Documents.
8. Prior to backfilling, check drain lines to assure free flow. Remove obstructions and recheck lines until satisfactory.

D. Jointing

Perforated and porous types of drain pipes shall be laid with closed joints.

E. Backfilling: Place a minimum of 12 inches of granular material, hand tamped, extending in width a minimum of 2 fee) from building wall. Then place a minimum of 6 inches of sand, well tamped. Continue backfill to within 3 feet of finished grade in planting areas. Remainder of backfill shall be comparable to existing adjacent soils. Where foundation drain is within 2 feet of finished grade, one-half of fill shall be made with crushed stone.

1. Filter fabric may be substituted for sand layer.
2. Vertical drainage mat in conjunction with geotextile may be substituted for sand and drainage material.
3. When drain lines are left open for connection to discharge line, the open ends shall be temporarily closed and their location marked with wooden stakes.

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