Smithsonian Institution

Office of Planning, Design & Construction

SPECIFICATIONS

PROJECT NO.: 1570104

PROJECT TITLE: SCBI-VA: NZP-SCBI ADMIN ROW ABATEMENT

FACILITY: NZP-SCBI Residence Row Improvements
NZP-Smithsonian Conservation Biology Institute
Front Royal, VA 22630

DATE: March 01 2022

This project is approved as being in conformance with applicable provisions of the Smithsonian Directive (SD) 410.

Michael J. Carrancho, P.E., Deputy Director Date

600 Maryland Avenue, S.W.
Suite 5001
Washington, D.C. 20024
Voice: 202.633.6230 Fax: 202.633.6233

USPS Mail: OPDC Capital Gallery
MRC 511
P.O. Box 37012
Washington, D.C. 20013-7012

S P E C I F I C A T I O N S

TABLE OF CONTENTS

54. Identification Badges [NOT USED]
55. NOT USED
56. Security of Temporary Openings
57. Existing Building Alarm Systems [NOT USED)
58. SCBI Officer Duty Charges

SCHEDULES AND PAYMENTS

59. Schedule of Values
60. Scheduling & Payments / Bar Chart
61. Scheduling & Payments / Critical Path Method
62. Assignment of Claims

PROJECT CLOSEOUT REQUIREMENTS

63. Project Closeout
64. Substantial Completion
65. Final Completion and Acceptance

DIVISION 2 EXISTING CONDITIONS

028200 Asbestos Abatement
028300 Lead Abatement

DIVISION 3-5 NOT USED

DIVISION 6 WOOD, PLASTICS AND COMPOSITES

061000 Rough Carpentry
062200 Millwork

DIVISION 7 THERMAL AND MOISTURE PROTECTION

079200 Joint Sealants

DIVISION 8 OPENINGS

085413 Fiberglass Doors

DIVISION 9 FINISHES

092900 Gypsum Board
099123 Interior Painting

DIVISION 10-33 NOT USED

END OF TABLE OF CONTENTS

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01000

SUPPLEMENTARY CONDITIONS FOR CONSTRUCTION

PROJECT SUMMARY AND INFORMATION

1. PROJECT INFORMATION

1.1. OFEO Project No. 1570104

NZP-SCBI Residence Row Improvements
NZP-Smithsonian Conservation Biology Institute 1500 Remount Road
Front Royal, VA 22630

1.2. Smithsonian Institution Contacts:

Contracting Officer (CO), address for Fed Ex and UPS delivery: Smithsonian Institution
Office of Contracting (OCON) 2011 Crystal Drive
Suite 350/MRC/200 Arlington, VA 22202-3709

Contracting Officer (CO), address for USPS delivery: Smithsonian Institution
Office of Contracting (OCON) PO Box 37012
MRC 1200
Arlington, VA 20013-7012

Contracting Officer's Technical Representative (COTR) Mr. Mathew Burch for Construction Phase Smithsonian Institution
National Zoological Park
General Services Building, Room 109 Office of Planning, Design and Construction
3001 Connecticut Avenue, NW
Washington, DC 20008

2. SUMMARY OF WORK

2.1. The Contractor shall furnish all supervision, labor, materials, and equipment needed to abate lead paint and hazardous asbestos for (6) residential/commercial buildings located along Administration Road, Front Royal, VA 22630 at the Smithsonian Institution's SCBI (Smithsonian Conservation Biology Institute), as set forth on the Drawings for OFEO Project No. 1570104, sheets l through 9 and in these specifications, both dated December 17, 2021.

2.2. The work includes but is not limited to:

2.2.1 Test and investigate dust and insulation particles in the crawl spaces of Building 54, 86, 110 and 86 for potential Asbestos Containing Material (ACM). Perform full abatement of ACM.

2.2.2 Refer to a Lead Base Paint (LBP) Assessment and Risk Management Report prepared by Mantec company for items having LBP. Remove LBP as directed by COTR and as noted on the drawings.

2.2.3 Modify existing architectural items as required for the HVAC and Electrical systems and as noted on the drawings.

2.2.4 Remove and replace windows and doors from the Basement Level floors.

When contractor has completed and checked his work, he or she will contact COTR for an inspection. Contractor shall clean up and dispose all debris associated with job. Contractor will be responsible for all labor, materials, and equipment to complete project.

This short description, however, shall not, in any way, be construed to limit the Contractor’s obligation for compliance with the contract specifications.

2.3. Critical Elements of the Work: The successful Contractor shall be fully qualified to install critical elements of the Work. Upon request of the Contracting Officer, bidders shall submit a statement of qualifications to address the following critical elements of the Work:

HazMat Removal

Working on a occupied campus

3. CONTRACT TIME FOR COMPLETION

3.1 Work under this contract shall begin by the Contractor within seven (7) calendar days after the Notice to Proceed and shall be completed within the total contract time of 180 calendar days. All work, including inspections, testing, correction of deficiencies, and project close-out activities, shall be completed in every respect within the contract time.

3.2 The start date and completion date shall be as stated in the Notice to Proceed issued by the Contracting Officer.

4. SCHEDULE OF OPTIONS FOR BID

4.1. The following is a brief statement of the Work identified for bid options. The complete description of the Work is identified elsewhere in the drawings and specifications.

N/A

5. SCHEDULE OF UNIT PRICES – NOT USED

6. BIDDER/OFFEROR EXAMINATION OF SITE

6.1. Every effort was made to indicate all work necessary to complete the project as identified. All bidders must carefully examine the premises during the bid period and satisfy themselves as to the extent, nature and location of the work, general and local conditions, particularly those bearing on transportation, disposal, handling and storage of materials, availability of labor, water, electric power, access routes, uncertainties of the weather, type of equipment and facilities needed for the successful execution of the Work.

6.2. Pre-Bid Conference and Site Visit. Before the bid opening date, a scheduled pre-bid conference and site visit will be announced by the Contracting Officer. The purpose of the scheduled meeting is to provide an opportunity for all bidders to review the project site. Any comments, information or discussion during the site visit shall not modify the contract documents.

6.3. This project requires special arrangements for access to a non-public area. Access to the site may be restricted at times other than during the scheduled visit. Coordinate access with COTR.

7. AVAILABILITY OF DOCUMENTS – N/A

7.1. The bidder may obtain a compact disc with electronic versions of drawings and specifications from:

Smithsonian Institution
Office of Engineering Design and Construction
600 Maryland Avenue, SW., Suite 5001
Washington, DC 20560

7.2. The bidder is responsible for making their own hard copies of the solicitation documents.

SPECIAL PROJECT REQUIREMENTS

8. UNITS OF MEASURE

8.1. All fabrication and installation shall be performed in accordance with the units of measure given in the Contract Documents. Units of measure on this project are Imperial units.

9. NON-PUBLIC, TENANT AND SECURED SPACES

9.1. Certain tenant spaces, non-public spaces, utility and equipment rooms and other areas related to or used for purposes of storage, conservation, research, curation of SCBI collection and artifacts or for scientific research may have restricted access.

9.2. The Contractor shall identify to the COTR as soon as possible, but no less than two (2) workings days in advance, any occupied areas that the Contractor must access that are located outside the limits of the project site. The Contractor shall identify in writing:

9.2.1. Restricted areas to be accessed.

9.2.2. Specific reason for needing access.

9.2.3. Nature of the work to be performed.

9.2.4. Date(s) and hours needed to complete construction work activity.

10. ARTIFACTS AND SCIENTIFIC RESEARCH MATERIALS (NOT USED)

11. PROTECTION OF HISTORIC PROPERTIES

11.1. The project site is located in a designated National Historic Landmark property and requires special attention to the quality of materials selected for installation and workmanship

efforts to satisfactorily preserve and restore historic elements and finishes of an historic landmark structure.

11.2. Upon request of the COTR, the Contractor shall submit evidence of technical competence in restoration work for National Historic Landmark structures, including subcontractor resumes, references and photographs or previous similar work.

12. COMMITMENT TO SUSTAINABILITY

(This is not a LEED project however Construction Waste Management and Disposal in Section 12.2 will apply.)

12.1. The Smithsonian Institution is a trust instrumentality of the United States (recognized as a tax-exempt organization under Section 501(c)(3) of the Internal Revenue Code) and although not an Executive Branch of the U.S. Government, is committed to planning, designing, constructing, maintaining and operating its owned and leased buildings and facilities consistent with Federal environmental and energy management requirements, as listed in the Smithsonian SF Codes, Standards and Guidelines document, dated February 15, 2012, to the maximum extent practical.

13. COMMISSIONING

13.1. The Smithsonian requires Fundamental Commissioning (as defined by the LEED NC and CI rating systems) of all eligible design and construction projects, even if the project is not eligible to pursue LEED certification.. The Contractor shall coordinate work of different trades, as necessary, with the activities of and the requirements issued by the Smithsonian and the Commissioning Provider, including:

13.1.1. The Commissioning Plan, a resource to identify the strategies, aspects and responsibilities within the commissioning process for each phase of the project, outlining the overall project schedule, organization, responsibilities and documentation requirements of the design process. Refer to specific trade commissioning requirements that may be located in other sections of the technical specifications.

13.1.2. The Owner’s Project Requirements (OPR), the functional requirements of a project and expectations of the building’s use and operation as they relate to systems to be commissioned. The OPR addresses the owner use and requirements, environmental and sustainability goals, energy efficiency goals,

indoor environmental quality requirements, equipment and system expectations, building occupant and operations and maintenance personnel requirements.

13.1.3. Basis of Design (BOD), which includes a narrative description of the design of any systems to be commissioned and any design assumptions.

CONTRACTOR USE OF PREMISES

14. HOURS OF WORK, WORKDAYS AND GOVERNMENT HOLIDAYS

14.1. Work shall be performed, under this contract, during the normal workdays of Monday through Friday, except Smithsonian holidays and special events as specified herein and the normal work hours of <TBD at Pre-construction Meeting>. Coordinate with COTR.

14.2. The premises will be continually occupied, requiring that certain work under this contract may need to be performed during periods other than that specified above. All shutdowns and outages must be approved by and coordinated with the COTR and occur between the hours of 6:00 p.m. to 6:00 a.m., unless otherwise approved.

14.3. For each occasion the Contractor intends to work on Saturdays, Sundays or Smithsonian holidays or during hours other than those indicated above, the Contractor shall obtain written permission from the COTR, at least three (3) working days in advance.

14.4. The Contractor shall reimburse the Smithsonian Institution for security and inspection services provided by the Smithsonian when the Contractor chooses to work outside the normal workdays and hours, as identified herein. However, the Contractor will not be charged for SCBI overtime security and inspection services, if in the opinion of the COTR, the work cannot be done during the normal workdays and hours due to requirements of the Smithsonian.

14.5. Smithsonian Holidays: For holidays that fall on Saturday, the Smithsonian holiday is observed on the previous Friday. For holidays that fall on Sunday, the Smithsonian holiday is observed on the following Monday. The Smithsonian Holidays are listed below. Also see the National Zoological Park website for a listing of special events.

New Year's Day	January 1
Martin Luther King Jr.'s Birthday	January, third Monday
George Washington's Birthday	February, third Monday
Memorial Day	May, last Monday
Independence Day	July 4
Labor Day	September, first Monday
Columbus Day	October, second Monday
Veterans' Day	November 11
Thanksgiving Day	November, fourth Thursday
Christmas Day	December 25
*President's Inauguration Day	*January 20, xxxx

15. CONDITIONS AFFECTING CONTRACTOR'S WORK

15.1. Existing Occupied Spaces: The premises will be occupied during the performance of the Work. The Contractor shall schedule work activities to minimize interruption of occupants and occupied spaces. Efforts will be made to temporarily move employees and contents out of specific areas under construction, as needed, during the times requested by the Contractor. However, the needs of the Smithsonian Institution take precedence and free access for the Contractor cannot always be guaranteed. The Contractor may work in animal areas only in the presence of authorized Smithsonian staff. Areas that will remain occupied include the grounds of the SCBI.

15.2. Relocation of Existing Occupants: N/A

15.3. Space for Contractor Use: The space available for Contractor's use shall be coordinated with COTR at the project site. Space allocation and availability are subject to change, at the discretion of the Smithsonian, to meet the needs of all parties requiring access and space within the building, work area, and the surrounding areas.

16. CONTRACTOR DELIVERIES, HAULING AND ACCESS

16.1. Normal deliveries shall be made between the hours of 7:00 AM and 02:00 PM. The Contractor's materials and equipment shall be delivered, received, receipted for and handled by the Contractor's personnel.

16.2. Access to the site for on- and off-loading of all material, structures and equipment shall be designated by the COTR .

17. DRESS AND DEPORTMENT

17.1. Contractors' personnel shall be fully and appropriately clothed at all times and shall conduct themselves in a manner appropriate to a public place. The COTR may require removal of any individual from the premises and project for unacceptable dress, demeanor or disruptive conduct, if the Contractor superintendent fails to correct conditions in violation of this paragraph.

17.2. The Government reserves the right to exclude or remove from the site or building any employee of the Contractor or Subcontractor as the Government deems incompetent, careless, insubordinate, or otherwise objectionable, or whose continued employment of the work is deemed by the Government to be contrary to public interest.

18. CONTRACTOR PARKING

18.1. Coordinate with COTR.

19. EATING, DRINKING, SMOKING AND ILLEGAL SUBSTANCE USE

19.1. Eating and drinking in Smithsonian buildings or leased space will be allowed only in designated areas. Offenders may be subject to removal from the premises and project should the Contractor's Superintendent fail to correct conditions, which, in the opinion of the COTR, violate this clause.

19.2. Gambling and the consumption of alcoholic beverages by the Contractor's personnel is prohibited in all Smithsonian buildings or leased space.

19.3. Smoking or carrying lighted tobacco products is prohibited in all Smithsonian buildings or leased space, in exhibition and public spaces, in areas where hazardous materials are stored or handled and in areas undergoing construction, renovation or repair. Acceptable areas for smoking are outside of the building, as designated by the COTR.

19.4. The possession, sale and/or use of narcotics or other illegal substances or firearms by Contractor employees are strictly prohibited in all Smithsonian facilities and leased space. Contractor employees are strictly prohibited from working on the project under the influence of alcohol and/or illegal substances. Contractor employees in violation of any of the above prohibitions will be removed from the project.

PROJECT COORDINATION

20. COORDINATION OF TRADES

20.1. The Contractor shall coordinate work of different trades so that interference between mechanical, electrical, architectural and structural work, including existing services, shall be avoided.

20.2. Refer to MasterSpec (AIA) Division 01 sections on General Commissioning Requirements following this section 010000.

20.3 Where work by separate entities requires off-site fabrication of products and accurate interfacing of materials to produce the required results, the Contractor shall prepare coordination drawings to indicate how work shown on separate shop drawings will be interfaced, intermeshed and sequenced for installation. Coordination drawings shall be submitted in accordance with the requirements of the "Submissions" section.

20.3.1. Work installed prior to approval of coordination drawings shall be at the Contractor's risk. Subsequent relocations required to avoid interferences shall be made without additional expense to the Smithsonian. If an interference develops, the COTR will decide which work shall be relocated, regardless of which was installed first.

20.4. Installation of equipment and systems shall allow the maximum practical space for operation, repair, removal and testing, within the limits indicated on the Contract Documents. Pipes, conduit, ducts and other system components shall be installed as close as possible to

ceiling slabs, walls and columns to minimize space used while accommodating function and maintenance.

21. QUALITY CONTROL

21.1. The Contractor shall provide qualified site personnel responsible for quality control, inspections, testing and re-testing as necessary for all work, including that of Subcontractors, to assure compliance with the contract documents.

21.2. Testing Requirements: Except as specifically stated otherwise, the Contractor shall be responsible for all field sampling and in-place testing required by the contract documents.

21.2.1. Independent Testing Laboratory: The Contractor shall provide an independent, commercial testing laboratory to perform all sampling and testing services required, unless otherwise specified. The testing services shall be on- or off-site as required. Submit complete documentation of all tests performed in connection with the construction contract.

21.2.2. Smithsonian Acceptance of Laboratories: Except for factory tests, all field sampling and testing normally performed by commercial laboratories shall be performed by an independent commercial laboratory employed by the Contractor and accepted by the COTR. The Contractor shall submit the following information to the COTR for approval:

21.2.2.1. Name, registration number and engineering discipline of the Registered Professional Engineer in charge of the laboratory.

21.2.2.2. Affidavit of compliance and certification that the laboratory performs work in accordance with requirements as stated in the contract documents.

21.2.2.3. A list of testing equipment proposed for each test procedure including latest calibration data.

21.2.2.4. A copy of the latest Laboratory Inspection Report by an independent agency with laboratory certification that deficiencies (if any) have been corrected.

21.2.2.5. Names and qualifications of persons actually performing testing and sampling. Changes in personnel shall be approved by the COTR prior to performance of work under this contract.

21.3.4. Test Results: Test results shall cite the contract requirements, the test or analytical procedures used the actual results and include a statement that the item tested or analyzed conforms or fails to conform to specification requirements. The cover sheet for each report shall be conspicuously stamped in large red letters "CONFORMS" or

"DOES NOT CONFORM" to the specification requirements, as the case may be. All test reports shall be signed by a testing laboratory representative authorized to sign certified test reports. The Contractor shall arrange for immediate and direct delivery of the signed reports, certifications and other documentation to the COTR.

21.8. Documentation: The CQC shall prepare or assist with the preparation of the following documents:

21.8.1. Daily Reports: The Contractor's Daily Report, as discussed in the section Contractor Correspondence and Daily Reports, shall be signed by the CQC Representative as well as the Superintendent. The CQC Representative's signature certifies that, to the best of his or her knowledge, the report is complete and correct and that all materials, equipment and work described on the report are in compliance with the contract plans and specifications, except as noted otherwise.

21.8.2. Special Inspection and Documentation: Reports of Special Inspections shall be signed by both the CQC Representative and the CQC Specialized Supplemental Person who witnessed the test or inspection certifying compliance with the specific contract requirement.

21.8.3. As-Builts: The CQC Representative shall ensure that all requirements for as-built record drawings and specifications are met. The CQC Representative or Specialized Supplemental Personnel assigned to inspect that particular portion of work shall initial each as-built drawing or technical specification section to certify its accuracy prior to submission in accordance with the Project Close-Out Requirements section.

22. PERMITS, LICENSES& FEES

22.1. The Contractor shall obtain and pay for all applicable permits and licenses required by D.C. regulating agencies, including but not limited to: storm water management, water quality as it relates to Rock Creek disturbance, elevator permits, etc.

22.2. The Contractor shall pay all duties, fees, taxes and other charges and give all notices necessary and incidental to the due and lawful execution of the work.

22.3. The Contractor shall keep the Smithsonian indemnified against all penalties and liability for breach of provisions of any national, provincial, district or city statute, ordinance or law and the regulations and by-laws of any local or other duly constituted authority, which may be applicable to the Work and with such rules and regulations of public bodies and companies.

22.4. Accessibility for Physically-Disabled Persons: The Contractor's shall provide temporary constructions at the site as necessary to maintain access for physically disabled persons. All provisions for temporary access shall be subject to the approval of the COTR.

23. UTILITY SERVICE INTERRUPTIONS AND NEW CONNECTIONS

23.1. Any planned interruption in utility service must be approved by and coordinated through the COTR. The Contractor shall submit a written request as far in advance of scheduled interruption as possible, but no less than two (2) full working days in advance. The Contractor shall make the necessary temporary provisions to supply continuous electrical power, HVAC space conditioning and security as required during periods when service is interrupted.

23.2. Work shall be coordinated to minimize the number and duration of outages.

23.3. All planned shutdowns and outages must occur between the hours of 6:00 p.m. to 6:00 a.m., unless otherwise approved by the COTR.

23.4. The Contractor's work efforts to restore service shall be continuous until the interrupted utility is back in service.

23.5. The electrical power for may not be interrupted without advanced coordination with the COTR.

23.6. A fire watch shall be provided for the time periods when fire suppression and detection systems are out of service.

24. SMITHSONIAN-FURNISHED ITEMS INSTALLED BY THE CONTRACTOR

24.1. The following items shall be furnished by the Smithsonian for installation by the Contractor as part of this contract:

ITEM	DELIVERY LOCATION
Not Applicable	

24.2. Required delivery dates for all Smithsonian furnished items shall be included in the Contractor's Project Schedule, as discussed in the Schedules and Payments section. Any items requiring delivery within the first sixty (60) days of the project or prior to submission of the Project Schedule shall be identified at the Preconstruction Meeting.

24.3. The COTR will notify the Contractor of scheduled delivery dates no less than two (2) full working days in advance of delivery. The Contractor shall accept delivery of the items on scheduled dates or be responsible for any damage and/or expenses resulting from his failure to take delivery. Promptly upon delivery, the Contractor shall contact the COTR and they shall jointly inspect the material or equipment for possible shortage or damage. If a shortage or damage is found, the Contractor and the COTR shall submit a report to the Contracting Officer.

24.4. The Contractor shall be responsible for proper storage and protection of items delivered, including all expenses incidental thereto.

24.5. For each item, the Contractor shall receive, sign for receipt, provide additional transportation as necessary, uncrate, assemble, locate in place and provide complete installation including all connections necessary for operation or use. Installation and connection shall be in accordance with manufacturer's specifications as well as contract documents, including all labor and material required.

25. SALVAGE

25.1. The Smithsonian Institution assumes no responsibility for salvage value or any loss or damage to materials or structures on the site for which the Contractor may have reflected a salvage value in his or her offer.

25.2. Except as specifically stated in the contract documents, construction materials, equipment or other items that are to be removed and neither re-used under this contract nor reserved as property of the Smithsonian Institution shall become the property of the Contractor and shall be removed from the premises by the Contractor.

26. CUTTING, PATCHING AND MATCHING EXISTING WORK

26.1. Existing work shall be cut, drilled, altered, removed or temporarily removed and replaced as necessary for performance of work under the contract. Work that is replaced shall match similar existing work. Structural members shall not be cut or altered, except where noted on drawings, without authorization of the COTR. Work to remain in place, which is damaged or defaced during this contract shall be restored to match the conditions existing at the time of award of the contract, at no additional cost to the Smithsonian.

26.2. Conditions exposed by removal of existing work that do not match new finishes or align with new work shall be called to the COTR's immediate attention. Necessary corrective work directed by the COTR will be subject to adjustment provisions as stated in the General Conditions of the contract.

PROTECTION OF THE SITE DURING CONSTRUCTION

27. PROTECTION OF THE SITE

27.1. The Contractor shall provide adequate protection for all parts of the building, including interior and exterior surfaces, its occupants and contents and grounds wherever work under this contract is performed.

27.2. Plan for Protection of the Site: The Contractor shall submit a plan for protection of the site to the COTR for approval. As a minimum, the Plan shall describe:

27.2.1. Proposed method, location and construction of temporary enclosures.

27.2.2. Routes of access and egress, including those for people with disabilities.

27.2.3. Location and maintenance of emergency exits.

27.2.4. Methods of protection of existing surfaces and occupants.

27.2.5. Means of connection of temporary enclosures/surfaces to existing historic materials.

27.3. During construction, temporary enclosures shall be constructed to prevent unauthorized access or egress. Dust and fume barriers shall be constructed, as needed or as determined by the COTR, to seal and isolate the work area from the remainder of the interior areas while the work is in progress. Wood used for protection of the site shall be pressure-impregnated, fire-retardant. All plastic sheeting shall be fire retardant 6-mil polyethylene. Submit product data to the COTR for review and approval.

27.4. The Contractor shall submit information describing the proposed construction of temporary enclosures and methods of installation to the COTR for approval. Any connections to existing structures must be accomplished in such a way as to minimize disturbance of existing surfaces.

28. PROTECTION OF FLORA, FAUNA AND IRRIGATION SYSTEM

28.1. Flora Protection: The Contractor is expressly prohibited from collecting plant materials on Smithsonian property.

28.2. The Contractor shall not store materials inside the drip-line of trees or shrubs. Prior to the start of the work on site, the Contractor shall surround trees within the project site and adjacent areas with a protective fence ("snow fence"), 1.4 m high (minimum), 300 mm outside the drip line (minimum). The protective fencing shall be constructed of heavy-duty metal posts or pressure-treated 100 mm X 100 mm wooden posts, 1 m on center, with a top and bottom stringer of 50 mm X 100 mm members. The fencing fabric shall consist of 40 mm X 13 mm slats, pressure-treated.

28.3. Vehicular traffic inside the drip-line of trees, on turf areas or on flowerbeds is not permitted without prior approval of the NZP's Department of Horticulture through the COTR. If flowerbeds must be crossed by vehicles, bridging is required. Bridging shall be 100 mm thick timbers 2 layers of ¾ inch exterior grade plywood or 2" x 10" or 1" protective plastic decking such as Bravo mat or equal] to help prevent soil compaction of the soil in the lawn areas and flowerbeds. Any turf area used for parking with prior approval as noted above must first be planked by the Contractor.

28.4. Where aerial work is being performed above flower/shrub beds, the Contractor shall protect them with an approved protective framework installed at least 300 mm above the tops of the plant materials. The Contractor shall submit the proposed method of protection to the COTR for approval. Trees and shrubs shall only be tied back with the approval of the COTR.

28.5. Any damage to the existing irrigation systems during construction shall be repaired by the Contractor within two calendar days from when the damage occurred.

28.6. The Contractor shall bear all costs for replacement of damaged plant materials. Replacement plant materials shall meet the criteria established by the SCBI

28.7. Plant material removed by the Contractor for reuse shall be balled, bagged and protected

28.8. The Contractor shall be responsible for the daily removal of trash and construction debris from turf and flower/shrub beds within the limits of construction.

28.9. Any plant material destroyed and/or damaged by the Contractor during construction shall be replaced with like genus and species of the same size, at no additional cost to the Smithsonian. The damaged plant materials must be replaced prior to final payment. The same applies to artifacts or furniture collection pieces. The COTR requires five (5) working days' notice should any of the artifacts or furniture collection need to be removed to facilitate construction.

29 DEBRIS CONTROL AND DAILY CLEANUP

29.1. The Contractor shall regularly clean up the work areas and shall, at all times, maintain the project in as neat and orderly a manner as is consistent with normal operations. Debris resulting from construction operations shall be removed from the site daily by the Contractor. The Contractor shall keep all access, haul routes and site areas free of dirt, debris and other materials resulting from construction activities.

29.2. Under no circumstances shall any rubbish or waste be dropped or thrown from one level of scaffolding to another or within or outside the building. Rubbish may be lowered by way of chutes, taken down on hoists or lowered in receptacles.

29.3. In addition to a general daily clean-up and removal of rubbish, the Contractor shall immediately prior to final inspection for completion and acceptance, or when directed by the COTR, have all surfaces swept and dusted, and all finished surfaces washed and in a new appearing condition with all stains, soil marks, dirt and other forms of defacement removed.

29.4. Trash receptacles: The Contractor shall provide enclosed trash receptacle(s) in quantity and size necessary to meet project needs, located as approved by the COTR. Trash receptacles shall not be placed out of public viewing.

29.5. Refer to -Construction Waste Demolition Waste Tracking Sheet, following section 010000.

The Contractor shall recycle, salvage or otherwise divert from landfills and incinerators, at least 50%, with a goal of at least 75%, by weight (tons), unless otherwise noted, of non-hazardous construction and demolition material. The contractor shall track recycling efforts and diversion rates using the Construction and Demolition Waste Tracking Sheet, attached. Before any work is started, the contractor shall submit a Construction Waste Management Plan, consisting of waste identification and a waste reduction work plan. Waste identification shall indicate anticipated

types and quantities of demolition, site-clearing, and construction waste generated by the Work. Include estimated quantities and assumptions for estimates. Waste reduction work plan shall list each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures. With each application for payment, the contractor shall submit the Construction and Demolition Waste Tracking Sheet, attached, with data compiled for the payment period, including receipts from hauler or destination. Before request for substantial completion, the contractor shall submit calculated end-of-Project percentage of waste diverted from landfills and incinerators (recycled, salvaged, or disposed) as a percentage of total waste generated by the Work. With request for final payment, the contractor shall submit actual percentage of waste diverted from landfills and incinerators (recycled, salvaged, or disposed) as a percentage of total waste generated by the Work.

29.6. All food and food wrappings brought on the premises must be properly disposed of in approved containers that are secured from animals and pests.

30. DUST AND AIR QUALITY CONTROL

30.1. The Contractor will execute the Work by methods that minimize dust, vapors and gases raised by construction operations. The Contractor will utilize engineering controls and work practices to prevent airborne dust, vapors, gases and objectionable odors from dispersing into the atmosphere and from being drawn into existing air-intake louvers, ductwork, and adjacent elevator shafts. A work plan of methods and means for this section shall be submitted to the COTR for review and approval.

30.2. Dust barriers shall be erected, where necessary, to protect adjacent areas from dust infiltration as required by the COTR. Dust barriers shall be rigid and visually opaque and shall seal the work area by affixing to the structure on all sides (i.e. ceiling, walls and floor). Wood used for dust barriers shall be pressure-impregnated, fire-retardant treated lumber. All plastic sheeting shall be fire-retardant 6-mil polyethylene. Submit product data for review and approval to the COTR.

30.3. Means of connection of dust barriers to existing structures shall not damage the building fabric. Details of barriers shall be submitted for approval to the COTR.

30.4. No open fires or burning of trash are permitted.

31. NOISE CONTROL

31.1. The Contractor shall comply with the regulations of the Virginia and OSHA Standards 1926.52 and 1910.95 and all other regulations relative to safety noise control.

31.2. Activities that generate excessive noise or vibration and interrupt SCBI functions or create public disturbances may be required to be performed during off-hours at the discretion of the COTR.

31.3. The Contractor shall provide sound attenuation to maintain acoustic level below 75 dBA at a distance of 15 m or below 75 dBA in occupied staff areas if less than 15 m away from noise source.

32. VERMIN, PEST AND RODENT CONTROL

32.1. The Contractor shall use non-chemical means and practices that deter or prevent the introduction of pests into the project site or premises. No chemical means shall be permitted. Contractor's focus should be NO FOOD DEBRIS on site with mandatory daily cleanup and removal.

33. DRILLING, WELDING TORCH CUTTING AND OTHER OPERATIONS THAT PRODUCE AIRBORNE CONTAMINANTS

33.1. Daily Permits:
When welding, torch cutting or other heating operations are to occur inside existing structures, the Contractor shall obtain a daily HOT WORK PERMIT. During the course of the Work, all existing smoke and heat detectors and sprinklers heads must remain operable. Coverings may be applied to protect them from spray coatings or other hazardous conditions only during the actual operations. Coverings must be removed immediately after the operations have concluded, but at the end of each working day at a minimum. When work produces dust or other airborne contaminants, e.g. spray painting, that could impair existing fire suppression or detection system(s) or when the system itself is otherwise impaired (drained down, etc.), the Contractor shall obtain a daily FIRE SYSTEM IMPAIRMENT PERMIT.
Each permit must be obtained at least two working days in advance from the COTR and posted at the job site prior to beginning the scheduled work.

33.2. Fire Watch: No welding or torch cutting shall be performed unless adequate fire protection is provided. The Contractor shall maintain a fire watch for the duration of welding, cutting and heating operations and for at least 30 minutes after the 'hot' work has stopped. A fire extinguisher (minimum 10 pounds, dry-chemical type, typical) shall be on hand when drilling, welding or cutting.

33.3. Use of Impact Hammers: The use of impact hammers or other equipment causing vibration, noise and dust may be harmful to collection animals and/or building occupants. The Contractor shall request approval from the COTR at least five (5) working days before beginning this type of work to ensure adequate time for notification of building occupants and protection of objects and collections.

33.4 Ventilation: The Contractor shall provide adequate ventilation to prevent air contamination or the accumulation of toxic materials. Take necessary measures to prevent welding fumes from entering mechanical ventilation systems, or passive transfer to adjacent areas. Seal all adjacent ducts and equipment openings with plastic. Where transfer is deemed likely or verified by the COTR, utilize local exhaust ventilation with HEPA filtration to control

welding fumes. The Contractor shall submit means and methods for controlling air contamination to the COTR for review and approval.

TEMPORARY CONSTRUCTION FACILITIES

34. CONTRACTOR FIELD OFFICES, TRAILERS AND SHEDS

34.1. The Contractor shall [may] establish a temporary office at the project site. The Contractor shall provide information about proposed locations of any temporary office, sheds, trailers and staging and storage areas and designation of size, color and materials to the COTR for approval at least five (5) working days prior to mobilization.

34.2. The Contractor may provide his own locking device on the door to the temporary office, trailer or shed. The Contractor shall be solely responsible for the safekeeping and security of the construction facilities, materials and equipment.

34.3. Upon completion of the Work, the temporary offices, trailers and sheds shall be removed and the area returned to its original pre-contract condition.

35. STAGING, STORAGE AND WORK AREAS

35.1. Staging and Storage Areas: The Contractor shall coordinate with the COTR the use of any area proposed for staging and storage of materials and equipment at least five working days prior to mobilization or at the Preconstruction Meeting, whichever is first.

35.2. The Contractor shall provide adequate storage and protection of materials and equipment delivered to the site to prevent theft, weather damage, mold infiltration, moisture damage and other physical damage. . The site shall be maintained in a neat and orderly manner as to further minimize hazards to personnel, animals, visitors, materials and equipment.

35.3. Plan for Staging, Storage& Work Areas: The Contractor shall submit a drawing of areas proposed for construction operations for approval by the COTR at least five (5) working days prior to mobilization or at the Preconstruction Meeting, whichever is first. The drawing shall show buildings, utilities, temporary toilet facilities, temporary utility extensions, temporary interior walls and barriers to limit unauthorized intrusion and to control noise and dust, pedestrian walkways, vehicular access, temporary fencing, trailers, sheds, storage areas and the Contract's desired route for access and egress to the premises and to the project site.

35.4. All wood used for temporary, interior construction shall be pressure-impregnated with a "Dricon" treatment or an equal treatment approved by the Smithsonian Institution. All pieces must bear the UL "FR-S" stamp. Intumescent (fire-retardant) paint shall not be used. All plastic sheeting shall be fire retardant 6-mil polyethylene. Submit product data to the COTR for review and approval.

35.5. Fencing: The Contractor shall provide and maintain a construction fence surrounding the project in accordance with the contract plans and technical specifications and wind requirements.

36. SANITARY/TOILET FACILITIES

36.1. Contractor Shall provide to meet employees' requirements.

37. TEMPORARY UTILITY SERVICES AND EXTENSIONS

37.1. Existing electrical, and water utilities are available for the Contractor's use as designated by the COTR.

38. SCAFFOLDING AND PLATFORMS

38.1. The Contractor shall erect temporary scaffolding in accordance with OSHA 29 CFR 1926.451 and ANSI A10.8. The Contractor shall provide landing platforms with stairways or ladders for proper access and egress to all work areas.

38.2. For all frame scaffolding greater than two sections height, the Contractor shall submit working drawings to the COTR a minimum of ten (10) working days in advance of scaffolding erection. Working drawings submitted by the Contractor shall be certified by a registered Professional Engineer. Provide additional safety plan and training certifications for any motorized scaffolding or lifts. Provide weight and size of any proposed motorized lifts for approval.

38.3. During non-working hours, the Contractor shall close and lock the scaffolding/lifts with a physical barrier to prevent access by unauthorized persons.

39. PROJECT SIGNS – N/A

MEETINGS

40. PRECONSTRUCTION MEETING

40.1. A Preconstruction Meeting will be scheduled with the Contractor before any work is started at the site. As soon as possible after the Date of Award, the COTR will contact the Contractor to arrange a time, date and place for the conference to review the contract requirments for the project.

40.2. All of the Contractor's staff and Subcontractors whose presence is necessary or requested by the COTR shall attend the Preconstruction Meeting.

40.3. Coordination Plan: The Contractor shall use the Preconstruction Meeting to develop a Coordination Plan for interaction with other parties working in or using the facility. The plan shall be submitted no less than five (5) working days after the Preconstruction Meeting and shall address interactions with other contractors, tenants, the public and any others making use of the site and surrounding areas. As a minimum it shall include:

40.3.1. Locations of overlap in use of the site by the Contractor and others, including work areas, delivery points, access/egress areas.

40.3.2. Specific items of work by others required to support critical milestones in the Contractor's schedule.

40.3.3. Completion or delivery of work by others that may impact the Contractor's schedule.

40.3.4. Portions of the work that create special hazards or disturbances.

40.3.5. Portions of the work that affect utilities, fire-protection or detection systems or security systems.

40.3.6. Events requiring access to areas outside of the project site or secured spaces.

40.3.7. Protection to be provided by the Contractor for work completed by others either before or during this project.

41. PRE-CONDITION SURVEY OF THE SITE

41.1. After the Preconstruction Meeting and before the start of work on the site, the project site (i.e. building, yards, contents, grounds and equipment) shall be inspected by the Contractor, major Subcontractors, COTR and other Smithsonian Institution and SCBI personnel as may be required for the purpose of verification of the existing conditions. Any damages or defective equipment will be noted at this time and this survey will serve as the basis for the establishment of the pre-contract conditions. The identification of pre-contract conditions will be jointly established by the Contractor and Smithsonian Institution.

4.1.2. Any damage to the buildings, yards, their contents, grounds, or equipment that occurs during the contract period, unless noted as existing during the inspection as specified above shall be repaired to its pre-contract condition by the Contractor at no cost to the Smithsonian or National Zoological Park. The COTR will determine the adequacy of the repairs as required in the previous paragraph.

41.3. Written and photographic documentation: The Contractor shall prepare a typewritten and photographic report in PDF format to identify damages or defects of materials, equipment and the site. The Contractor shall submit report electronically to the Contracting Officer and the COTR.

42. PROJECT MEETINGS

42.1. Progress Meetings: The COTR will lead regular progress meetings with an interdisciplinary integrated management team consisting of representatives (as required) of the Contractor, Smithsonian, Architect/Engineer, Commissioning Provider, major Subcontractors and other critical Subcontractors and suppliers. The purposes of these meetings are to expedite the work, coordinate and schedule the Work and coordinate the work with Smithsonian activities. Progress meetings shall be held weekly unless otherwise directed by the COTR. The time and place of the meetings will be established at the Preconstruction Meeting. The Contractor shall

ensure that all required Subcontractors and suppliers attend the Progress Meetings and the COTR will ensure that all necessary SI personnel attend.

42.2. Special-Topic Meetings: At the discretion of the COTR, additional separate meetings may be scheduled to address issues of quality control, sustainability requirements, coordination between contractors on the premises, coordination with other agencies, scheduling of the work, application for payments, etc. The Contractor's staff and Subcontractors or Suppliers whose presence is necessary or requested by the COTR shall attend.

42.3. Meeting Minutes: The Contractor shall promptly prepare minutes of each meeting and transmit to the COTR, within five (5) working days.

SUBMISSIONS

43. SUBMITTAL DEFINITIONS

43.1. Submittals are defined to include shop drawings, product data, samples and additional data required for submission to the COTR for review and approval prior to incorporation into the work.

43.1.1. Shop Drawings: Detailed drawings, schedules, diagrams and illustrations prepared specifically for this project by the Contractor or any subcontractor, manufacturer, supplier or distributor to illustrate fabrication and/or installation of a portion of the Work.

43.1.2. Schedule: A detailed tabulation of components, items or parts to be furnished for use on this project.

43.1.3. Statement: An affirmation prepared by the Contractor, the installer or manufacturer of a material, product or system, to satisfy a requirement defined in a technical section.

43.1.4. Factory Test Report: A written report of the findings of a test performed by the Contractor on an actual portion of the Work or prototype prepared for this project before it is shipped to the site.

43.1.5. Field Test Report: A written report of the findings of a test performed by the Contractor on a portion of the Work during or after installation.

43.1.6. Certificate of Compliance: A written statement, signed by an authorized official of the manufacturer of a product or system or supplier of a material attesting that the product, system or material meets the requirements of the contract documents. The certificate of compliance must be dated after the award of this Contract and must name

the project and cite the specification section, paragraph and requirements, which it is intended to address.

43.1.7. Product Data: Illustrations, standard schedules, performance charts, instructions, brochures, diagrams, manufacturer's descriptive literature and catalog information illustrating a material, product or system to be installed on this project, including all data related to LEED requirements, such as recycled and regional content information, Volatile Organic Compound (VOC) product schedules, Forest Stewardship Council (FSC) chain-of-custody documentation and other documentation as requested by the COTR.

43.1.8. Color Charts: Pre-printed brochures showing the color range of a material.

43.1.9. Test Reports: Reports verifying that a material, assembly, system, process or laboratory meets requirements established in the Contract Documents. Reports shall indicate compliance by naming and describing the test method and test results. Testing must have occurred within three (3) years of the date of award of this contract.

43.1.10. Samples: Physical examples of materials, equipment, assemblies or workmanship establishing standards for evaluating finished Work.

43.1.11. Color/Texture Selection Sample: Samples of an available range of textures and/or colors of a material formed of the actual finish material over a substrate identical to that which will be used in the field.

43.1.12. Mock-up: An assembly or sample panel constructed in accordance with specifications to show construction details, finished appearance and/or performance.

43.1.13. Material Safety Data Sheets: Instructions, warnings and recommended and required handling and use procedures for individual hazardous materials published by the product manufacturer.

44. SUBMITTALS AND REVIEWS

44.1. Contractor Responsibility for Submittals: The Contractor shall provide all required submittals, by technical specification section, in accordance with the contract documents. All submittals, with exception of mockups or samples, are to be submitted electronically by email in PDF format. The Contractor shall clearly indicate on the submittal that it has been reviewed by the Contractor and found to meet the project requirements. Any items submitted as substitutions shall be clearly identified as such on the submittal and the transmittal document. If shop drawings show variations from the contract documents because of standard shop practices or for other reasons, the Contractor shall provide a separate, written description of variations along with the submittal. The Contractor shall:

44.1.1. Review each submittal for conformance with requirements of the contract documents and coordination with related work.

44.1.2. Determine and verify all field measurements, required material quantities, method of assembly or erection, installation requirements and proper connection to adjoining materials installed by others.

44.1.3. Assure that all submittals use the appropriate units of measure. All drawings and technical data shall be in SI (metric) units for projects designed in SI units. Preprinted literature in other units shall be accompanied by documentation to show conformance to project requirements.

44.1.4. Transmit all required submittals for a technical specification section at the same time unless prior written waiver of this requirement has been provided by the COTR.

44.1.5. Transmit submittals to the COTR in a logical and orderly sequence in accordance with the Submittal Schedule to prevent project delays or adversely impact work by the Smithsonian Institution or other contractors.

44.1.6. Correct and resubmit submittals according to response from Smithsonian Office of Engineering Design & Construction.

44.1.7. Commence work on items requiring submittals only after all related submittals are reviewed and approved by the Smithsonian. All Work shall conform to approved submittals.

44.2. Submittal Schedule and Control Log: The Contractor shall submit, to the COTR, a schedule of work-related submittals using the Smithsonian SF Submittal Log form within *fourteen (14) calendar days after the effective date of the Notice to Proceed. (An electronic Submittal Log form is available upon request.) Submittals shall be listed in the order they are scheduled to be submitted and the following information shall be given:

44.2.1. Project Name, Project Number, Contractor Name, Contract Number;

44.2.2. Technical Specification Section for each submittal;

44.2.3. Unique Submittal Number;

44.2.4. Description of item to be submitted, as listed in the specifications;

44.2.5. Date item must be submitted to the Smithsonian in order to support the project schedule;

44.2.6. Subcontractor providing submittal (in "Comments" column).

44.3. Quantities for Submittals: Unless otherwise noted in the technical specification, the Contractor shall deliver to the COTR:

44.3.1. Shop Drawings: Submit electronic copy of shop drawings in PDF format. Submittal will be forwarded electronically to the AE for review. After submittal review,

submittal will be returned to the Contractor electronically, in PDF format. Submit in DWG format, if requested. Submit two reproducible black line prints, if requested.

44.3.2. Product Data, Test Reports, Color Charts, etc. The Contractor will make electronic submittals in PDF format, except for Color Charts. Submit two (2) original Color Charts from each product representative to be retained by the Smithsonian; copies or printouts from the computer will not be accepted. After submittal review, submittal will be returned to the Contractor electronically, in PDF format.

44.3.3. Color/Texture Samples: Submit two (2) samples, minimum size 600 mm by 600 mm, unless otherwise specified. After submittal review, one (1) sample may be retained by the Smithsonian.

44.3.4. Mock-up and Sample Installations: Unless otherwise specified, minimum size shall be as noted to complete a panel section or normal break in the work.

44.3.5. Written Text Documents, Plans and Reports: Submit electronic copy of written text documents, plans and reports in PDF format. Submittal will be forwarded electronically to the AE for review. After submittal review, submittal will be returned to the Contractor electronically, in PDF format.

44.4. Submittal Reviews by the Smithsonian: Reviewed submittals will be marked "Approved," "Approved as Noted," "Resubmit" or "Disapproved." Submittal approval by the Smithsonian shall not relieve the Contractor of responsibility for submittal errors, omissions or deviations from the contract documents. Approval of submissions does not constitute acceptance of substitutions except as covered under sub-paragraph entitled "Contract Requests for Substitutions."

44.5. Submittal Review Period: The Contractor shall transmit, to the COTR, all submittals sufficiently in advance of the time necessary for fabrication and installation to allow for review by the Smithsonian and return to the Contractor, including any time needed for correction and resubmission by the Contractor. The expected time required by the Smithsonian for review of initial submission is 14 calendar days. No extension of the Contract Time will be granted for the Contractor's failure to allow sufficient time for review and processing, including resubmission of items that are initially rejected due to improper submission or non-compliance with the Contract Documents.

44.6. Contractor Requests for Substitutions: Contractor requests for items identified by manufacturer, brand name, make, catalog number, etc. in the contract documents shall be submitted to the Contracting Officer for approval prior to contract award, in accordance with the General Conditions. After award of the contract, contractor requests for substitutions may be considered and accepted by the Smithsonian at the discretion of the Contracting Officer.

44.7. Construction Progress Schedule Submittal: The Contractor shall submit a progress schedule within one (1) calendar day from the date of the Notice to Proceed. No work shall start at the site until the progress schedule has been approved by the COTR. The schedule shall

provide a weekly breakdown of activity including interaction between trades and be subdivided in accordance with items of work or areas of the job where the work is to take place. The schedule shall also list equipment, special devices, hardware, products or other items requiring long lead time, when these items are ordered and the projected delivery dates. The last week of the schedule shall reflect final inspection, testing, and the correction of deficiencies.

45. CRITERIA FOR PRODUCT SELECTION

45.1. To the greatest extent possible, subject to the restrictions of the Buy American Act, provide products, materials or equipment of a singular generic kind from a single source. Where more than one choice of a product or material is available for Contractor's selection, select an option, which is compatible with other products and materials already selected.

45.2. Provide products complete with accessories, trim, finish, safety guards and other devices and details needed for complete installation for intended use and effect.

45.3. Products, which, by nature of their application, are likely to be needed at a later date for maintenance and repair or replacement work, shall be current models for which replacement parts are available.

45.4. Product selection shall be done in accordance with the following requirements:

45.4.1. Standards, Codes and Regulations: Select from among products that are in compliance with the project requirements, as well as with construction standards, all applicable codes and regulations and LEED requirements.

45.4.2. Performance Requirements: Provide products that comply with specific performances indicated and are recommended by the manufacturer (in published product literature or by individual certification) for the application indicated.

45.4.3. Prescriptive Requirements: Provide products that have been produced in accordance with prescriptive requirements, using specified ingredients and components and complying with specified requirements for mixing, fabricating, curing, finishing, testing and other operations in the manufacturing process.

45.4.4. Visual Matching: Where matching with an established sample for color, pattern and/or texture, the COTR shall determine whether a proposed product matches the sample.

45.4.5. Avoidance of banned materials: The Contractor will commit to not using the following toxic and hazardous materials:

45.4.5.1. Products containing asbestos, urea formaldehyde, polychlorinated biphenyls (PCBs) and/or chlorinated fluorocarbons;

45.4.5.2. Products containing lead content, including older or flux containing more than 0.2 percent lead; domestic water pipe or pipe fittings containing more than 8 percent lead; and paint containing more than 0.06 percent lead.

46. PROGRESS PHOTOS – N/A

47. CONTRACTOR CORRESPONDENCE AND DAILY REPORTS

47.1. The Contractor shall correspond with the COTR for all matters related to this construction project, unless otherwise directed. All correspondence shall be signed and dated by the Contractor and shall reference the project, project number and contract number.

47.2. The Contractor shall maintain daily reports using the Smithsonian Institution Contractor's Daily Report form. Reports shall be numbered consecutively and all sections shall be completed or noted as "not applicable." Reports shall contain detailed remarks each day, including but not limited to progress on the job, problems discovered and discussions with Smithsonian staff. Reports shall be submitted to the COTR each day for the previous workday.

SAFETY, HEALTH AND FIRE PROTECTION

48. JOB SITE SAFETY

48.1. Safety Coordinator: The Contractor shall designate a person responsible and accountable for personnel safety at both corporate and project level at the project site for the duration of the project. Contracts specifically requiring safety or industrial hygiene personnel shall include a copy of their resumes. Qualifications for the Safety Coordinator shall include the OSHA 30-hour course or equivalent course.

48.2. Job Site Safety Plan: The Contractor shall submit a Jobsite Safety Plan within 5 calendar days of the Contract Award and at least 5 calendar days prior to mobilization to the site for approval by the COTR. As a minimum, the plan shall detail the procedures, designated persons, instructions and reports to be used to assure jobsite safety for all contractors, subcontractors, Smithsonian personnel, the public and others on the site.

48.2.1. Site Specific Safety Plan: Upon award of this contract, the contractor shall provide a Site-Specific Safety Plan (SSSP). The SSSP is a safety and health policy and program document and outlines how the contractor will safely conduct their work. This plan shall be job-specific and shall also address any unusual or unique aspects of the project or activity for which it is written. The SSSP shall interface with the employer's overall safety and health program, and a copy shall be available on the work site. Any portions of the employer's overall safety and health program that is referenced in the

SSSP shall be included as appropriate. The plan shall include but not limited to the following:

a. Signature Sheet that must include plan concurrence (e.g., Chief of Operations, Corporate Chief of Safety, Corporate Industrial Hygienist, project manager or superintendent, project safety professional, project QC). Provide concurrence of other applicable corporate and project personnel (Contractor).
b. Background Information that must include Brief project description, description of work to be performed, and location; phases of work anticipated these will require a Job Hazard Analysis (JHA's). OSHA 3071
c. Statement of Safety and Health Policy
d. Responsibilities and lines of Authority
e. Subcontractors and Suppliers
f. Training
g. Safety and Health inspections that include assignment of responsibilities for a minimum daily/weekly job site safety and health inspection during periods of work activity level of technical proficiency needed to perform the inspections, proof of inspector's training/ qualifications
h. Accident Reporting
i. Plans (programs, procedures) required by the Safety Manual. Based on a risk assessment of contracted activities and on mandatory OSHA compliance programs, the Contractor shall address all applicable occupational risks and compliance plans. Using the 29 CFR 1926 and/or current and accepted procedures in the EM 385-1-1 as a guide.
j. Risk Management Processes Detailed project-specific hazards and controls shall be provided by a Job Hazard Analysis for each major phase/activity of work, including but not limited to work involving confined space, fall protection, trenching/excavation, crane/rigging, steel erection, hot work, protection of the public, scaffolding, and other activities that involve high risk potential.

48.2.2 Project Specific Safety Plan Must Include the following:

SCBI Safety and Security Safety Plan Insert

SCBI SAFETY & SECURITY ORIENTATION – A pre-work safety and security orientation will be required for the on-site supervisor at a minimum but is available to all contracted parties if requested. This is to ensure that SCBI policies and procedures in these areas listed below are well understood. This will be coordinated through the SCBI Safety Coordinator and SCBI Police offices on or before the project start date.

ON-SITE COMMUNICATION – An ICOM hand-held radio and charger will be issued to the on-site Project Supervisor to better enhance communications between contractors and SCBI personnel. This radio will be furnished by the SCBI COTR's. The COTR's office is located in Building #99 Deer Circle.

MEDICAL EMERGENCY RESPONSE AND POC'S

- DIAL 911 for all MEDICAL EMERGENCIES! (Warren County 911 Cal1 Center/Front Royal)
    - Fire Department – Warren County
    - Ambulance – Warren County
    - Sheriff's Department – Warren County

- **All 911 calls from SCBI property** WILL be followed by an immediate call to SCBI Police, if no answer, then to Allied Barton Security (ABS), in order to facilitate a timely response.

- **Accident Reporting** - All accidents on-site (SCBI) will be reported to the SCBI Police, SCBI Safety Office or COTR as soon as is feasible. A paper copy of the report will be requested for documentation purposes only!

- **Hospital Location** - In the event of a serious injury or extreme medical emergency, workers will be transported to the nearest emergency room.
    - Warren Memorial Hospital: 1000 North Shenandoah Avenue, Front Royal (540) 636-0300

- **Urgent Care Location** - Minor injuries will be referred to the nearest medical facility.
    - Front Royal Urgent Care: 65 Riverton Commons Plaza (Walmart/Lowes/Cracker Barrel on the east side of Interstate 66 on Hwy 522), Front Royal (540) 635-0700

- A map showing both medical facility locations is included.

- **First Aid** - Each worksite, if more than one, must be equipped with an easily accessible, well-stock first aid kit and at least one contracted employee who is trained/certified in first aid.

SCBI GATE 2 HOURS OF OPERATION: Monday – Friday, 6:00am to 5:00pm. Any deviation from these work times must be coordinated through the SCBI Police Office/Allied Barton Security and the SCBI COTR.

- Contractors will be issued temporary badges and vehicle rearview mirror tags for the duration of the work on SCBI. These are considered sensitive items and must be returned.

- Gate 3 can be utilized for special exceptions (oversized vehicle/loads) when needed.

*** ROAD SAFETY:**

- All large construction equipment (bulldozers, excavators, loaders, cranes, backhoes, etc.) moving on or near a facility road must have a FLAGMAN directing traffic. No exceptions! Flag persons must be wearing a high-visibility vest at a minimum.

- All heavy construction equipment mentioned above traveling-on SCBI roads must have a ground vehicle positioned in front as an escort vehicle. This restriction will be clarified based on vehicle type and job location.

- Facility wide **SPEED LIMIT – 15 MPH! This is strictly enforced!** Get stopped for speeding and your driving privileges will be revoked!

* **SCBI is a FEDERAL FACILITY** and therefore, any type of weapons, explosives, or illegal drugs is strictly prohibited!

* **Animal Areas/Buildings/Enclosures** – All "SCBI animal areas" are off-limits unless accompanied by an animal supervisor, animal keeper or curator!

* **Code Green Procedure** – Animal Emergency – Follow instructions given over hand-held radio! If assistance is needed during a Code Green event contact the SCBI Police or COTR.

* **Snake Removal** – Contact the SCBI Police, Safety Office or COTR for snake removal. Contractors are not authorize to handle or remove snakes from a job site without permission.

* **Feral/Wild Animal Safety** – Do not engage or harass facility feral animal wildlife. Contact the SCBI Police, Safety Office or COTR for a potential animal related problem or animal emergency.

EMERGENCY MANAGEMENT

- The **SCBI Emergency Shelter** is located in the Auditorium Bldg. #285 basement on the corner of Conservation Drive and Slate Hill Road. It is always accessible/open. Any basement area is considered an emergency shelter.
- Archives Bldg **Emergency Warning Siren** activation – seek shelter immediately and wait for follow-on instructions.
- Emergency instructions will be communicated over the hand-held radio and VOIP telephone intercom system

SCBI Points of Contact

Sgt. Luther Nichols/Officer Evelyn Jarrett/Officer Sara Riffle (SCBI Police-First Responders)
O: 540-635-6585 – SCBI emergency number
O: 540-635-6592
C: 540-532-5196
Hand-held ICOM radio - provided

Allied-Barton Security (ABS) - secondary POC Manager
O: 540-635-0069
C: 540-422-3238
Hand-held radio

Chuck Herndon – Facility Maintenance
O: 540-635-6512
C: 202-609-4659
Hand-held radio

TBA – Safety Coordinator
Manager
O: 540-635-6544
C: 202-498-2900
Hand-held radio

Robert Elswick – Asst. Facility Maint.

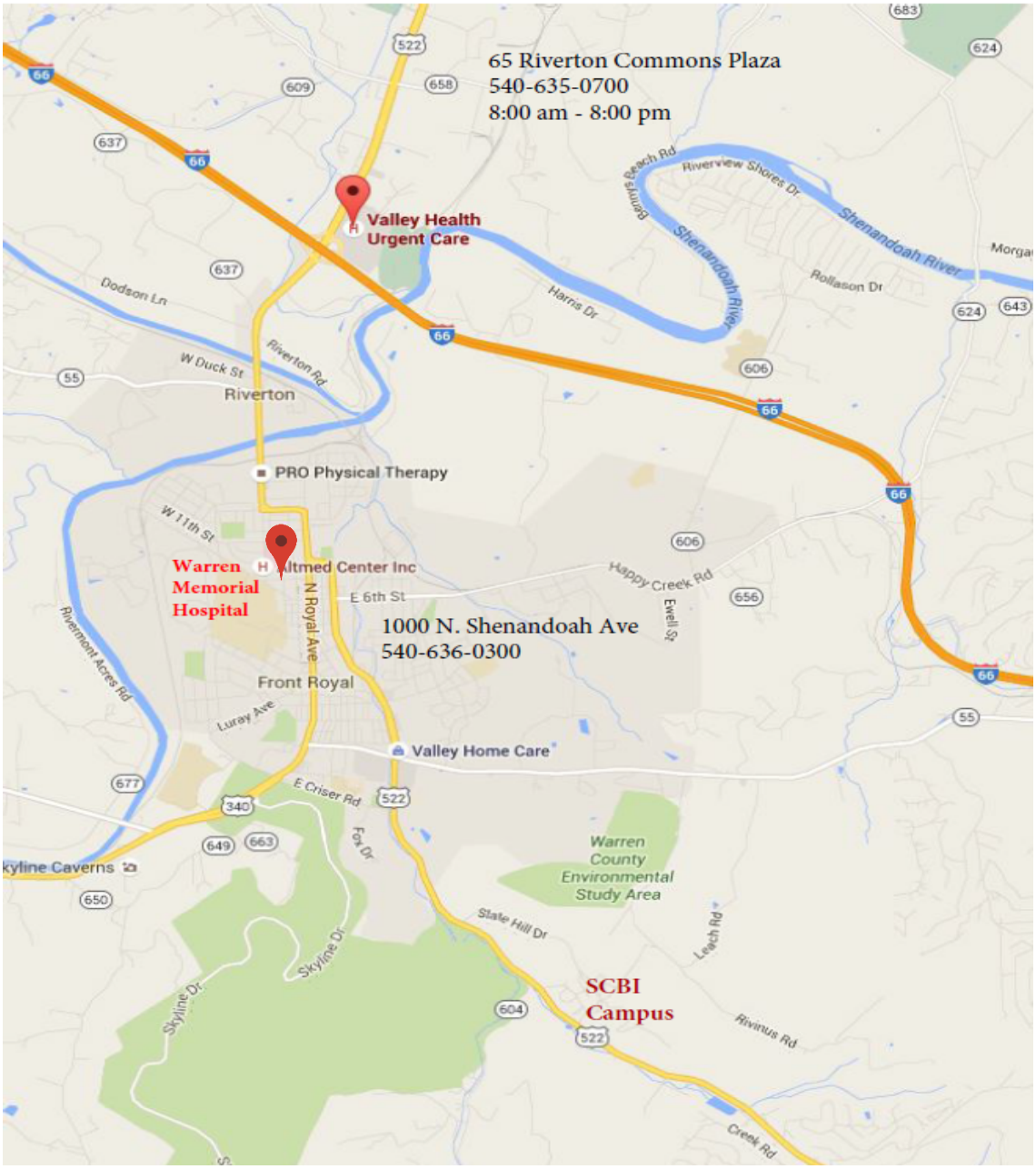
O: 540-635-0062
C: 202-528-6660
Hand-held radio

Matt Burch – Contracting Officer (COTR)
O: 540-635-6574
C: 202-286-9970
Hand-held radio

Paul Marinari – Senior Animal Curator
O: 540-635-6566
C: 540-6605260
Hand-held radio

Marc Muller – SI Resident Engineer
O: 540-635-0089
O: (DC) 202-633-4410
C: 202-345-9007

Warren County Sheriff's Office – Front Royal (non-emergency)
540-635-4128

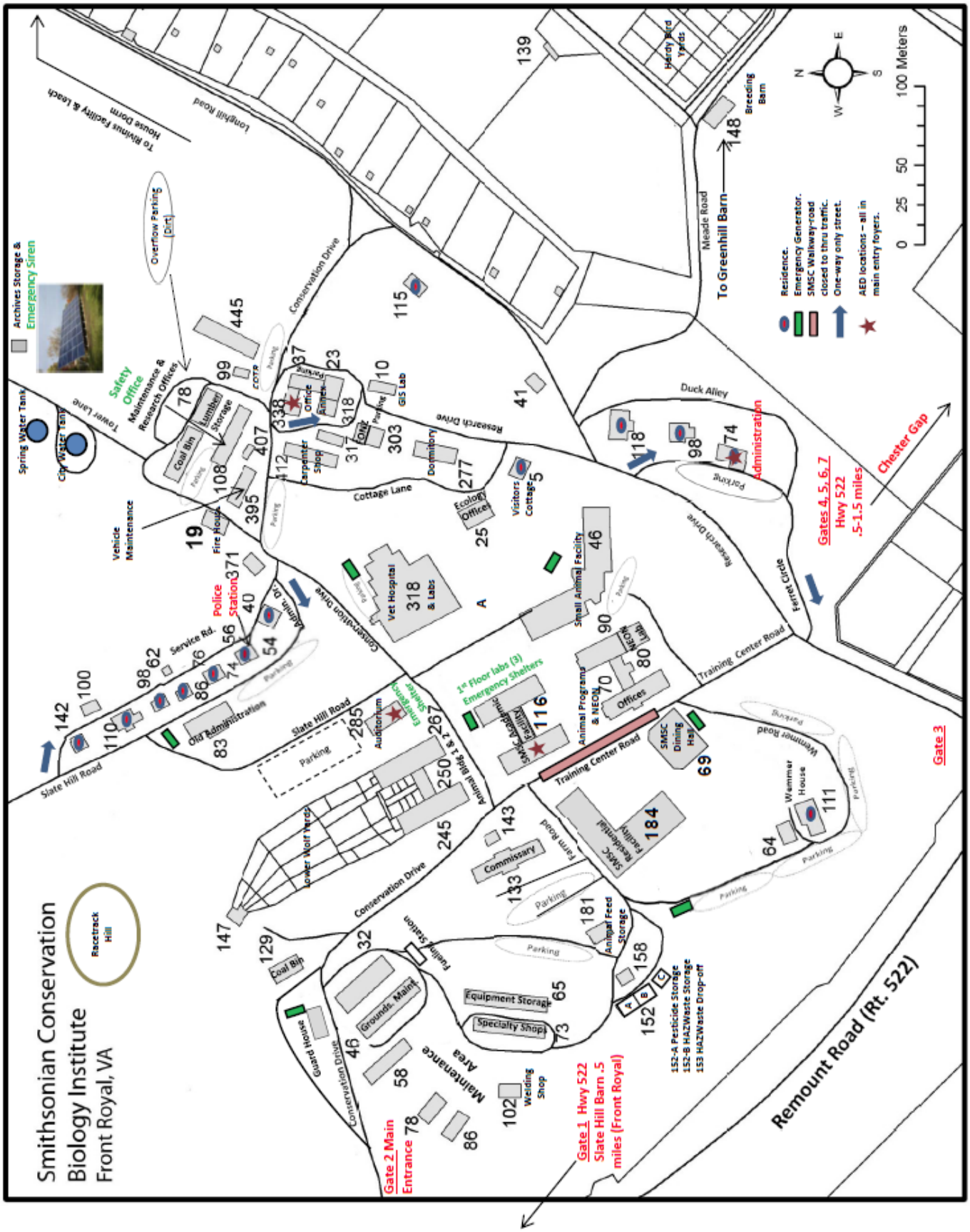


Valley Health Urgent Care
65 Riverton Commons Plaza
Front Royal, VA
540-635-0700
6.4 miles from Gate #2 Entrance

Warren Memorial Hospital
1000 North Shenandoah Ave
Front Royal, VA
540-636-0300
3.8 miles from Gate #2 Entrance

Hwy 522 – (Walmart/Lowe's plaza)

Hwy 522 – N. Commerce Ave – Left on West 6th St. – Right on N. Shenandoah Ave.



Warren County Emergency Services

Warren County Emergency Services – 2.2 miles
220 North Commerce Ave. #300
Front Royal, VA 22630
(540) 636-3830

Warren County Sheriff's Office - 2.8 miles
200 Skyline Vista Dr.
Fort Royal, VA 22630
(540) 635-4128

Front Royal Volunteer Fire and Rescue Department – 2.2 miles
221 North Commerce Ave.
Front Royal, VA 22630
(540) 635-2540

Warren Memorial Hospital: Emergency Room – 3.7 miles
1000 North Shenandoah Ave.
Front Royal, VA 22630
(540) 636-0300

Warren Memorial Hospital Op Center
120 North Commerce Ave.
(540) 635-0701

Chester Gap Volunteer Fire Department – 3.6 miles
42 Waterfall Rd.
Chester Gap, VA 22623
(540) 635-5482

Linden Volunteer Fire Department – 6.4 miles
4561 John Marshall Hwy.
Linden, VA 22642
(540) 636-3473

Winchester Medical Center – 28.3 miles
Level II Trauma Center
1840 Amherst Str.
Winchester, VA 22601
(540) 536-8000

Front Royal Valley Health Urgent Care – 6.5 miles
65 Riverton Commons Plaza (Walmart/Lowe's complex)
Front Royal, VA 22630
(540) 635-0700

North Warren Volunteer Fire & Rescue – 7.7 miles
89 Rockland Rd.
Front Royal, VA 22630
(540) 635-6759

48.3. Occupational Safety and Health: This contract is subject to Title 29 of the Code of Federal Regulations, Part 1910 "Occupational Safety and Health Standards" and Part 1926 "Safety and Health Regulations for Construction" pursuant to the Occupational Safety and Health Act (OSHA) of 1970 administered by the US Department of Labor, Occupational Safety and Health Administration.

48.4. Emergency Assistance: The Contractor shall post, at the site, telephone numbers for reporting emergencies, including the NZP's Police Station, ambulance, police, fire department, gas utility, electric utility, water/sewer utility, poison prevention aid and hazardous-waste handling. This information shall be posted in a conspicuous location within the project area prior to the start of any work at the site.

48.5. Safety Signs: The Contractor shall post legible accident prevention signs in construction areas in accordance with OSHA standards. Safety signs shall conform to ANSI 235.1 and 235.2 Vehicular traffic control devices, barricades and signals shall conform to ANSI D6.1.

48.6. Report of Accident or Illness: In the event of any accident or illness for which medical assistance is required, any criminal action or any fire, the Contractor shall notify the appropriate authority (Ambulance, Police, and Fire Dept.), Smithsonian Security, SCBI Police, and the COTR.

48.7. Emergency Evacuation: The Contractor shall post evacuation routes and facility emergency/self-protection plans at the site, train all employees in emergency procedures and document such training. In the event of a fire, the Contractor shall immediately activate the alarm at the nearest fire alarm pull station and notify building security. Upon the activation of the audible alarm, the building will be evacuated. No personnel shall reenter the facility until security personnel signal that the building is safe.

48.8. Contractor Personnel to be Contacted: The Contractor shall submit a written list of emergency telephone numbers and names of persons to contact for the General Contractor superintendent and for each major sub-contractor working on the project site. The initial list shall be submitted to the COTR at the Preconstruction Meeting. The list shall be updated and resubmitted to the COTR as needed.

49. TOXIC AND HAZARDOUS SUBSTANCES

49.1. The Contractor shall submit to the COTR for approval, at least ten (10) working days prior to their intended use, a written list of toxic and hazardous substances that will be used on the project. The Contractor shall submit a "Material Safety Data Sheet" similar to OSHA Form No. 20 for these substances to identify the following information:

49.1.1. Product Identification;

49.1.2. Hazardous Ingredients;

49.1.3. Physical Data;

49.1.4. Fire and Explosion Hazard Data;

49.1.5. Health Hazard Data;

49.1.6. Emergency and First Aid Procedures;

49.1.7. Reactivity Data;

49.1.8. Spill or Leak Procedures;

49.1.9. Special Protection Information;

49.1.10. Special Precautions;

49.1.11. Volatile Organic Compound (VOC) Content.

49.2. The Contractor will commit to not using the following toxic and hazardous materials:

49.2.1. Products containing asbestos, urea formaldehyde, polychlorinated biphenyls (PCBs) and/or chlorinated fluorocarbons.

49.2.2. Products containing lead content, including solder or flux containing more than 0.2% lead; domestic water pipe or pipe fittings containing more than 8% lead; and paint containing more than 0.06% lead.

49.2.3. Chlorofluorocarbon (CFC)-based refrigerants in new base building heating, ventilating, air conditioning and refrigeration (HVAC&R) systems and comprehensive CFC phase-outs when reusing existing base building HVAC equipment.

49.2.4. The Contractor hereby understands that historic properties may contain pre-existing harmful materials and coatings including, but not limited to, arsenic, lead, dioxide, polyvinylchloride (PVC) and asbestos. Upon discovery of hazardous or toxic materials, the Contractor shall alert the COTR immediately.

49.3 The Contractor shall monitor the use of all toxic and hazardous substances to ensure that exposure to their workers from airborne concentration of, or physical contact with, these substances does not exceed applicable regulatory worker health and safety exposure limits.

49.4. The Contractor shall monitor the use of all toxic and hazardous substances to ensure that exposure to Smithsonian Institution and SCBI employees and visitors to airborne concentrations of, or physical contact with, these substances is maintained as low as reasonably achievable. Any equipment or technical measures for this purpose must first be approved by the NZP's Safety Office through the COTR. Under no circumstances shall exposure exceed the established Short-Term Exposure Limit or 50% of the established Threshold Limit Values or Permissible Exposure Limits (whichever is less) as specified in either:

49.4.1. "Threshold Limit Values and Biological Exposure Indices" of the American Conference of Governmental Industrial Hygienists, latest revision, or

49.4.2. Title 29 CFR Part 1910, Subpart Z - "Toxic and Hazardous Substances" of the Occupational Safety and Health Standards, latest revision.

49.5. Exposure of the NZP's animals to air-borne or any other physical contact with any toxic or hazardous substance will be prohibited.

49.6. All toxic and hazardous substances and materials used by the Contractor must be removed from the SCBI property upon completion of the project.

49.7. The Contractor shall provide methods, means and facilities to prevent contamination of soil, water and atmosphere from discharge of noxious, toxic substances and pollutants produced by construction operations. The removal of contaminated waste shall be in compliance with applicable laws and regulations.

49.8. To achieve compliance with the requirements of this section, administration or engineering controls shall first be implemented whenever feasible. When such controls are not feasible to achieve full compliance, protective equipment or other protective measures shall be used to keep exposure of all persons within the prescribed limits. Descriptions of equipment or technical measures to be used for this purpose must be submitted to the COTR for approval. The Contractor's requirements for compliance with all applicable Local, Federal and State regulations remain in force.

49.9. The SI may reject any product that poses a high risk of fire or health hazard to staff, visitors or the building, based on flammability criteria (e.g. low flashpoint) or established toxicity data (e.g. designation as a human carcinogen).

49.10. The Contractor shall submit, to the COTR, a list of the hazardous materials to be stored on site and the manner in which they will be stored. All containers and storage cabinets shall be approved by the COTR and labeled as to hazard and content.

49.11. The SI has made every effort to identify and to notify the Contractor of hazardous materials that may be encountered during the work. However, if suspected asbestos-containing material, lead-based paint or other suspected hazardous materials are encountered during demolition or other phases of the work, the work involving the suspected material shall cease and the Contractor shall notify the COTR immediately.

50. PERSONAL PROTECTIVE EQUIPMENT

50.1. Personal protective equipment for eyes, face, ears, nose, head, extremities and/or full body shall be provided, used and properly maintained by the Contractor whenever necessitated by reasons of hazards encountered in a manner capable of causing illness, injury or impairment in the function of any part of the body.

50.2. Persons required to use personal protective equipment shall be thoroughly trained. Training programs shall, as a minimum, meet OSHA and EPA requirements where applicable. The Contractor shall submit proof and criteria for employee training as requested.

51. BARRICADES, BARRIERS AND WALKWAYS

51.1. The Contractor shall provide safety barricades in accordance with the National Transporation and applicable OSHA regulations. The Contractor shall also provide barricades, subject to approval by the COTR, to deter passage of persons and/or vehicles into construction areas as specified or necessary.

51.2. The Contractor shall install temporary barriers, in a manner satisfactory to the COTR, to contain and secure the site from unauthorized entry and to minimize the adverse effects of noise, dust and vapors generated by construction activities on surrounding areas. Barriers shall be constructed of pressure-impregnated fire-retardant treated wood, with fire-retardant 6-mil polyethylene as necessary. Submit all product data to the COTR for review and approval.

51.3. If the work interferes with public or employee access to the facility or parts of the facility, as determined by the COTR, the Contractor shall provide personnel barriers and signage to create easily identifiable, accessible (to people with handicaps) walkways around the work. Signs shall be posted at decision points to prevent unnecessary travel along changed routes and to dead ends. The barriers shall be erected and dismantled in phases so that a clear route is always available. The COTR and Contractor personnel shall have access through the barriers to the work areas. The Contractor may use hardware on the barrier doors to prevent entry by unauthorized persons.

51.3.1. Interior barriers shall be of standard drywall partition construction, painted and terminated at the underside of the existing ceilings. All requirements for fire protection shall be maintained.

51.3.2. Exterior barriers shall be of dimensional lumber and plywood, painted on both sides and supported to prevent overturning. Barriers shall be repainted and maintained as necessary to remain in good condition as long as they are required.

51.4. Unless specifically indicated otherwise, barricades, barriers and associated signs shall be removed upon completion of the Work. The Contractor shall coordinate the dismantling and removal with the COTR.

52. EXISTING FIRE PROTECTION SYSTEMS

52.1. During the course of the Work, all existing smoke and heat detectors and sprinkler heads must remain operable. Coverings may be applied to protect them from spray coatings or other hazardous conditions only during the actual operations. Coverings must be removed immediately after the operations have concluded. Damaged detectors and sprinkler heads shall be replaced immediately by the Contractor at no additional cost to the Smithsonian Institution. The Contractor shall test replaced detectors and sprinklers after installation to the satisfaction of the COTR.

53. GENERAL SECURITY REQUIREMENTS

53.1 The Contractor and his/her employees must comply with security requirements imposed by the National Zoological Park, including any necessary security clearances. Failure to inspect the site or obtain knowledge of security regulations shall not relieve the Contractor from security requirements or from performance of any part of the work.

53.2. Prior to the start of work on the site, the Contractor, after receiving the Notice to Proceed, shall submit to the COTR for approval, a list of the names, social security numbers, and addresses of all employees and subcontractor employees who will be working on the site. The list shall identify the Prime Contractor and each subcontractor and trade. It shall be updated as necessary to accurately identify all workers who will be working on the site during the project.

53.3. The name and telephone number of the Contractor's Superintendent and authorized alternate individual who can be reached on a 24-hour basis shall be provided to the COTR at the Preconstruction Meeting.

53.4 If the Contractor is required to accelerate the work in order to complete the project on schedule, or if other conditions arise as the result of Contractor's management of the work which required that work be accomplished during other than normal operating hours, the Contractor will be required to assume the cost of any additional inspection and guard services at overtime rates.

53.5. Notify the COTR prior to disturbing any alarm wiring, devices, systems, etc. Planned disturbances will be coordinated at least three (3) working days in advance of when the work is scheduled. Any alarm wiring, devices or systems that are disturbed for any reason must be reported to the COTR within five (5) minutes of the occurrence. The COTR will determine the procedures for repairing the damage and who will perform the repair work. The cost of such repairs will be borne by the Contractor.

53.6 The contractor shall provide adequate security to prevent the presence of unauthorized persons on the work site area, and to keep doors secured when not in actual use to insure the integrity of the barrier as well as for the property security.

53.7. The Contractor is prohibited from hunting, collecting, or feeding animals on Smithsonian property.

53.8. The Contractor is prohibited from feeding, petting or harassing any SCBI animal(s).

54. IDENTIFICATION BADGES (NOT USED)

55. NOT USED

56. SECURITY OF TEMPORARY OPENINGS

56.1. Any temporary opening in the building perimeter or between non-public and public interior spaces must be closed and secured with means acceptable to the COTR at the end of each workday. A clear and safe path shall always be maintained to allow visitors entrance into the National Zoological Park and its buildings. The Contractor shall secure his facilities and equipment during non-working times at his own expense. Authorized Smithsonian personnel shall have access to the work site.

57. EXISTING BUILDING ALARM SYSTEMS (NOT USED)

58. SCBI POLICE OFFICER DUTY CHARGES

58.1. If the Contractor is required to accelerate the work in order to complete the project within the specified Contract Time or if other conditions arise as a result of the Contractor's management of the work, which require that construction be accomplished during other than the normal workdays and hours defined for this project, the Contractor will be required to assume the cost of any additional inspection and SCBI police officer at overtime rates.

SCHEDULES AND PAYMENTS

59. SCHEDULE OF VALUES

59.1. The Contractor shall submit, to the COTR, a schedule of estimated values of all parts of the work. The breakdown of costs on the Schedule of Values shall follow the divisions used in the project specifications and shall reflect major items and groups of items shown on the Contractor's project schedule. All values shall be in US dollars.

59.2. Wages: The contractor shall verify wages and comply with regulated wage scales, i.e. Davis-Bacon, Service Contract Act, etc.

60. SCHEDULING & PAYMENTS / BAR CHART

60.1. Project Schedule: The Contractor shall submit to the COTR for approval a Gantt bar chart project schedule within 5 calendar days after the date of contract award. Submit Project Schedule in both PDF format and original scheduling software format. No work shall start at the site until the project schedule has been approved by the COTR. The approved bar chart will represent a baseline schedule on which the monthly construction progress will be indicated and submitted to the COTR. The baseline project schedule shall comply with the following:

60.1.1. Weekly breakdown of work activities shall be provided, including interaction between building trades, subdivided by items of work and areas of the project. Items of work shall be grouped and subdivided according to the divisions of the Construction Specifications Institute (CSI) format.

60.1.2. The start date and completion date shall be consistent with the Contract Time established by the Contracting Officer. Any intermediate deadline dates needed to meet specific requirements for Smithsonian use of portions of the work shall be shown.

60.1.3. Project condition survey activities shall be scheduled not later than the 14th calendar day of the contract time and prior to the start of any site work.

60.1.4. Project closeout activities shall be scheduled for completion in accordance with the requirements for the Contract Time for Completion.

60.1.5. Order dates and projected delivery dates shall be shown for equipment, special devices, hardware, products or other items requiring long lead-time.

60.1.6. Required delivery dates for items to be furnished by Smithsonian and installed by the Contractor shall be shown, as well as items to be furnished and installed by Smithsonian, which will affect the Contractor's work.

60.1.7. Review periods for all submittals and time required for all necessary inspection and/or testing shall be shown.

60.1.8. Dates shall be given for ordering, delivery, installation and testing of major equipment and special materials and equipment.

60.1.9. The Contractor shall specifically identify work activities and dates associated with construction options.

60.2. Revisions to Baseline Schedules: The Contractor shall submit, to the COTR for approval, all revisions to the approved baseline project schedule. The Contractor shall submit a proposed revision to the schedule as necessary along with proposals for construction changes, clearly indicating modifications to the schedule based on the proposal. The Contractor shall also submit, for review and approval, any proposed changes to the schedule due to inability to accomplish the work as planned, for any reason. Approved changes to the schedule shall be incorporated into the Project Schedule and it shall be resubmitted as necessary or as requested by the COTR.

60.3. Progress Behind Schedule: If it becomes apparent to the COTR that the overall progress of the project is behind the approved project schedule, then the COTR will notify the Contractor in writing. The Contractor shall submit to the COTR for approval a Recovery Schedule and Plan to describe how the Work will be accelerated to meet the Contract Time requirements in accordance with the General Conditions contract clause entitled " “Commencement, Prosecution and Completion of the Work." The Recovery Schedule shall be superimposed on the approved

baseline project schedule to demonstrate that proposed recovery activities will accomplish completion of the work by the approved completion date.

60.4. Reporting Progress and Applying for Payment: Each month, the Contractor shall apply for payment and submit a report of the actual construction progress as follows:

60.4.1. By the 25th of each month, the Contractor and the COTR shall have inspected the work to determine percentages complete for each item, projected through the end of the month. The parties shall attempt to reach agreement on each item, but if they cannot reach an agreement the COTR will determine percent complete.

60.4.2. By the last day of the month, the Contractor shall submit an Application for Payment based on the determined percentages complete for each item. The application shall be submitted in triplicate on the Smithsonian standard Application for Payment form. Each copy of the Application for Payment shall be accompanied by the following:

1. A Progress Schedule identifying the cumulative progress superimposed on the latest revision of the approved Project Schedule. The net progress for the month and applicable dates shall be clearly indicated.

2. A complete set of copies of certified weekly-payroll data for the period.

60.5. Response to Application:

60.5.1. Payment shall be made only for progress agreed upon by the COTR, performed on original Contract Work or approved modifications, in accordance with the current, approved Project Schedule. Failure to submit the Application in accordance with the specifications will prevent the processing of payments.

60.5.2. Payments will be mailed to the Contractor's address as identified in the contract documents on record with the Contracting Officer. Any changes of address or requests for wire transfer of progress payments must be made in writing, signed by the Contractor's authorized person and submitted to the Contracting Officer.

61. SCHEDULING & PAYMENTS / CRITICAL PATH METHOD

61.1. CPM Scheduling: The work under this project will be scheduled and reported by the Contractor using the Critical Path Method. Submit Project Schedule in both PDF format and original scheduling software format. The approved Project Schedule(s) shall be used by the Contractor for planning, organizing, executing and directing the work; for monitoring and reporting progress; and for requesting payment for work completed. All costs shall be identified in US dollars.

61.1.1. Order and Inter-Dependence of Activities: The Critical Path Method will be followed to show the order and interdependence of activities and the sequence in which the work is to be accomplished. Each activity shall be tied to all activities that must

logically precede or follow it and all paths shall be continuous through to completion date(s).

61.1.2. Work Breakdown Parameters for Activities: The activities shown on the network diagram shall include construction activities, submittal processing by the Contractor, submittal processing by the Smithsonian, procurement activities for major equipment, fabrication of special materials and equipment, installation of special materials and equipment, inspections and tests. All field activities that affect progress toward contractually required dates for completion of all or parts of the Work shall be shown. The level of detail shall be such that the duration of any activity will be no longer than ten (10) working days and no activity will have a dollar value exceeding $15,000, except as allowed by prior and specific approval of the COTR. All aspects of the contract activities are to be identified and priced accordingly in the proposal. This is to include, but shall not be limited to, separate pricing for bonds, insurance, CQC related work, etc. As-built drawings shall also be priced.

61.2. Required Schedules: The Contractor shall prepare and submit a Preliminary Project Schedule (to be reviewed at PRECON) , Complete Project Schedule, Condensed Summary Schedule, Progress Schedules and Recovery Schedules as described below.

61.2.2. Complete Project Schedule: Within 14 calendar days after receipt of Notice to Proceed, the Complete Project Schedule shall be submitted to the COTR for review and approval. The Contractor's submission of the Preliminary Project Schedule shall include four (4) copies and one (1) reproducible.

61.2.4. Progress Schedules: Each month, the Contractor shall prepare a Progress Schedule by inputting all information regarding actual start and actual finish dates, projected through the end of the month, into the computerized Project Schedule. Complete discussion of this requirement is contained in the section "Reporting Progress and Applying for Payment."

61.2.5. Recovery Schedule: If the work falls substantially behind the approved Project Schedule the COTR may require the Contractor to submit a Recovery Schedule in accordance with the Construction Contract Clauses paragraphs relating to "Commencement, Prosecution and Completion of Work." Upon request, the Contractor shall submit a Recovery Schedule to the COTR for approval within ten (10) working days. The requirements set forth herein in the sub-paragraph entitled "Complete Project Schedule," shall apply to all activities shown on the Recovery Schedule.

61.3. Changes Related to Requests for Proposals: For all proposals involving requests for time extensions or other significant changes to schedule, the Contractor shall submit a listing of all the activities affected, added, or deleted (by node numbers). The effect in time and money shall be described for each activity. If, in the opinion of the COTR, the proposed change may impact the

completion date(s), the Contractor shall submit a diagram of that portion of the network schedule affected by the changes, along with standard reports for analysis.

61.3.1 Diagrams and reports submitted to illustrate the impact of a proposed change shall show the necessary revisions to activities, along with their costs, durations, and trade responsibilities. Failure to submit such a diagram with a proposal shall constitute a waiver of any claims for time extensions associated with the subject of that proposal.

61.3.2 Modification of activity times shall be agreed to by both the Contractor and the COTR. In the event that agreement on modified activity times cannot be reached, the COTR will direct the specific time adjustments to be entered into the program to determine approved, revised, contract completion dates.

61.4. Response to Application:

60.4.1. Payment shall be made only for progress agreed upon by the COTR, performed on original Contract Work or approved modifications, in accordance with the current, approved Project Schedule. Failure to submit the Application in accordance with the specifications will prevent the processing of payments.

61.4.2. Payments will be mailed to the Contractor's address as identified in the contract documents on record with the Contracting Officer. Any changes of address or requests for wire transfer of progress payments must be made in writing, signed by the Contractor's authorized person and submitted to the Contracting Officer.

62. ASSIGNMENT OF CLAIMS

62.1. Assignment of Claims are subject to the approval of the Contracting Officer. Any Assignment of Claim or subsequent re-assignment shall meet the requirements of the General Conditions contract clause entitled "FAR 52.232-23 Assignment of Claims."

62.2. All documents for assignments shall be written in the English language and shall be original ink signatures of the Contractor and assignee. All monies shall be identified in US dollars.

PROJECT CLOSEOUT REQUIREMENTS

63. PROJECT CLOSEOUT

63.1. Definition: Project closeout is a scheduled process for fulfillment of remaining contract requirements at the end of the project in preparation for final acceptance, final payment, and normal termination of contract, beneficial occupancy and establishment of the warranty period.

64. SUBSTANTIAL COMPLETION

64.1. Definition: The date of Substantial Completion of a project or specified part of a project is the date, as confirmed by inspection by the COTR, when the construction is at least 95%

complete and ready for beneficial occupancy, so that the Smithsonian can take possession of that area or part of the work. Portions of the work that are specified to be phased for completion, areas required for Smithsonian's use prior to completion of the total project or items of work identified by the COTR as necessary for partial beneficial occupancy may be inspected for substantial completion separately from the rest of the Work.

64.1.1. The Smithsonian Institution reserves the right to occupy or install equipment in completed areas of the building prior to substantial completion provided that such occupancy does not interfere with the completion of the work. Such partial occupancy shall not constitute acceptance of any part of the work.

64.2. Request for Substantial Completion Inspection: The Contractor shall submit a written request to the COTR for an inspection to establish Substantial Completion status. This request shall specify areas or parts of the work to be considered and shall include a listing of all exceptions to the request, that is, items not considered to be substantially complete.

64.3. Submission of Operation and Maintenance Manuals: Prior to requesting Substantial Completion Inspection, the Contractor shall submit, to the COTR, three (3) sets of manuals for all systems and equipment, as specified in the technical sections of this specification. The manuals shall be bound in letter-sized, three-ring, loose-leaf binders with durable plastic covers. They shall be organized into suitable volumes of manageable size using the divisions of the Specifications as a guide. Each manual shall have a table of contents and shall be assembled to conform to the table of contents with tab sheets locating each subject. The instructions shall be legible and easy to read. Where oversize drawings are necessary, they shall be folded to be not greater than letter-size. The words "Operation and Maintenance Manual," the name and location of the project, project number, contract number, date and the name of the general contractor, shall appear on the cover. Data shall be specific to the equipment that is installed and reflect all approved changes and substitutions. Data shall also reflect any required or recommended seasonal adjustments or inspections. Include electronic copy of manual, in PDF format, on CD/DVD. Manuals shall include, as a minimum, the following data:

64.3.1. Detailed description of each system and each of its components, including layout showing piping, valves, controls and other components and including diagrams and illustrations where applicable.

64.3.2. Wiring and control diagrams with data to explain detailed operation and control of each component.

64.3.3. Control sequence describing start-up, operation and shut down.

64.3.4. Procedures for starting, operating and shut down.

64.3.5. Installation instructions.

64.3.6. Maintenance and overhaul instructions.

64.3.7. Lubricating schedule, including type, grade, temperature range and frequency.

64.3.8. Emergency instructions and safety precautions.

64.3.9. On-site acceptance test results for equipment installed under this contract.

64.3.10. Approved product data, shop drawings and system as-builts.

64.3.11. Copies of approved certifications and laboratory test reports (where applicable).

64.3.12. Notarized copies of warranties (originals to be provided as required by "Warranties and Guarantees").

64.3.13. Written instructions for test procedures.

64.3.14. Performance curves and rating data.

64.3.15. Parts list, including source of supply, recommended spare parts and service organization convenient to Smithsonian.

64.3.16. Name, address and telephone number of each subcontractor who installed equipment and systems, local representative for each type of equipment and each system.

64.3.17. Other pertinent data applicable to the operation and maintenance of particular systems or equipment and/or other data as specified Divisions 2 through 16 of the Specifications.

64.4. Other Prerequisites for Substantial Completion Inspection: The Contractor shall also complete the following prior to requesting inspection for certification of substantial completion:

64.4.1. Testing and start-up of systems.

64.4.2. Installation of all signage, including accessibility related signs, equipment instructions, identification labels and permanent directional signs.

64.4.3. Submission of spare parts, tools and surplus materials as required in technical specifications. Submit to the COTR an MSDS for each surplus material that contains toxic or hazardous substances. Surplus materials that the SI determines not to retain shall be removed and properly disposed of by the Contractor according to all applicable regulations.

64.4.4. Scheduling of training sessions for Smithsonian personnel.

64.4.5. Removal of all waste, rubbish and temporary facilities and services. Means of access to all areas of the work to be inspected by the COTR shall be maintained.

64.4.6. Disposition of samples and mock-ups not incorporated into the work.

64.4.7. Arrangement for permanent utility connections and billing responsibility transfer to Smithsonian's Office of Facilities Management and Reliability (OFMR).

64.4.8. Arrangement for transfer of security responsibility for the project site and changeover of locks by Smithsonian's Office of Protection Services (OPS).

64.4.9. Hazardous Waste Disposal: Submit copies to the COTR of the following hazardous waste records for hazardous waste generated on SI property and disposed of by contract personnel.

1. Hazardous Waste Manifests
2. Notification and Certification Forms
3. Material Profile Sheet or characterization
4. Container Content Sheets
5. Certificates of Disposal

64.5. Scheduling of the Substantial Completion Inspection: Within seven (7) calendar days after receipt of the Contractor's written request, the COTR will either schedule an inspection or advise the Contractor of work that must be completed or prerequisites that must be met prior to scheduling the Substantial Completion Inspection. In that case, another written request for Substantial Completion Inspection must be submitted when all requirements have been met.

64.6. The Substantial Completion Inspection: The Substantial Completion Inspection will be performed by representatives of the Smithsonian Institution led by the COTR. During the inspection, the COTR will prepare a punch list of deficiencies in the work. If the punch list becomes too extensive the COTR may cancel the inspection and require additional work to be performed for a repeat inspection.

64.6.1. For satisfactory inspection results, the COTR will issue the written punch list to the Contractor as soon as possible after the inspection. Items on the punch list must be completed prior to final acceptance of the total project work.

64.6.2. For unsatisfactory inspection results, the COTR will, within three (3) calendar days, give written notice to the Contractor that the Work or portion of the Work is not substantially complete in accordance with the contract documents and therefore does not meet Substantial Completion status. Requests for re-inspection shall meet all requirements for the original request for Substantial Completion inspection.

64.7. Punch List: Incomplete contract requirements identified during the Substantial Completion Inspection will form an initial basis for a punch list for final acceptance. All punch list items must be completed by the Contractor within the Contract Time. If additional days are

needed to complete the punch list items beyond the Contract Time, then the Contractor shall submit, prior to the end of the Contract Time, a written request to the Contracting Officer stating:

64.7.1. Items requiring additional time;

64.7.2. Amount of time needed to complete each item;

64.7.3. Reasons why the items cannot be completed by the contract completion date.

65. FINAL COMPLETION AND ACCEPTANCE

65.1. Definition: The date of final completion of a project is the date, as confirmed by inspection by the COTR, when the Work is satisfactorily completed and accepted in accordance with the contract documents, as amended and/or modified.

65.2. Request for Final Completion Inspection: When all items on the punch list have been corrected to the satisfaction of the COTR and additional requirements as described below have been satisfied, the Contractor shall submit a written request for Final Completion Inspection.

65.3. Prerequisites for Final Completion: Prior to requesting the inspection for certification of Final Completion, the Contractor shall complete the following:

65.3.1. Submission of a copy of a prior punch-list stating that each item has been completed or otherwise resolved for acceptance.

65.3.2. Provision of Instructions to Smithsonian Personnel -where instructions to Smithsonian personnel are specified in other sections, furnish, without additional expense to the Smithsonian, the services of competent instructors, who will give full instruction in the care, adjustment and operation of the systems and equipment to designated Smithsonian employees.

1. Each instructor shall be familiar with all parts of the system on which he or she is to give instruction and shall be knowledgeable about the systems' operation and required maintenance. Factory trained instructors shall be employed wherever practical and available.

2. Unless otherwise required or approved, the instruction shall be given during the regular work week after the equipment has been accepted and turned over to the Smithsonian for regular operation. Where significant changes or modifications in equipment are made under the terms of the contract, additional instruction shall be provided as may be necessary to acquaint the operating personnel of the changes or modifications. Unless otherwise stated, at least half of the time allocated for instruction shall be "hands-on," using the actual system installed.

3. Upon completion the Contractor shall obtain written acknowledgment from the COTR that the required instruction was completed.

65.3.3. Posting of operating instructions approved by the COTR for each system and each principal piece of equipment. Include wiring and control diagrams showing the complete layout of the entire system including equipment, piping, valves and control sequence framed under clear laminated plastic and posted where directed by the COTR. Printed or engraved operating instructions for each principal piece of equipment including start-up, proper adjustment, operating lubrication, shut-down safety precautions, procedure in the event of equipment failure and any other necessary items of instruction as recommended by the manufacturer of the unit shall be attached to or posted adjacent to the piece of equipment. Operating instructions exposed to the weather or wet or humid conditions shall be made of weather-resisting materials or shall be suitably framed and enclosed to be weather protected. Operating instructions shall not fade when exposed to sunlight and shall be secured to prevent easy removal or peeling. The Contractor shall coordinate the location of posted instructions with the COTR.

65.3.4. Provision of equipment demonstrations for each equipment item. The Contractor shall coordinate scheduling of all demonstrations through the COTR.

65.3.5. Submission of original warranties for all products, equipment and systems.

1. The Contractor shall assemble original warranty certificates or notarized copies of warranty certificates executed by the Contractor, Subcontractors, suppliers and manufacturers in a tab-indexed, three-ring loose-leaf binder with a durable plastic cover. Provide electronic copy, in PDF format, on CD. The table of contents shall identify the item covered, the location of the item, the date of Substantial Completion, expiration date of the warranty and the supplier, vendor and installing contractor. Duplicate notarized copies of warranties shall be provided as required by "Manuals for Operation, Maintenance and As-Built Product Data."

2. Each warranty certificate or bond shall identify the date(s) for:

(1) Substantial Completion status in accordance with project closeout requirements.

(2) Beginning and ending of the warranty period.

(3) The Contractor shall provide any coincidental product warranty, which is available on a product incorporated in the Work, but for which the warranty is not specifically required by the contract documents.

3. Warranty of Construction: The Contractor shall warrant that the work performed under this contract conforms to the contract requirements and is free of any defect in equipment, materials, design furnished or workmanship performed by the Contractor or any subcontractor or supplier at any tier. Unless otherwise stated in the technical sections of the Specifications, the

warranty of the Work shall continue for a period of one (1) year from the date of Final Completion status. If the Smithsonian takes partial occupancy before Final Completion, then the warranty for that portion shall be in effect for a period of one (1) year beginning on the date of Substantial Completion for that portion of the Work.

4. Response Time for Warrantee Items – For all items under the warrantee period that are deemed by the COTR as essential to the 24/7 operations of the facility, the contractor will provide (at no additional cost to SI) emergency response and corrective actions as required (less than 4 hours). Provide 24/7 contact personal.

65.3.6. Submission of construction progress photographs and negatives, property survey and similar final record information.

65.3.7. Arrangement for change-over locks through the COTR and Smithsonian Office of Protection Services as required for security for Smithsonian occupancy.

65.3.8. Submission of evidence of payment and transfer date of utility company accounts for those utilities previously billed to the Contractor during construction, as necessary.

65.3.9. Submission of evidence that all regulatory agency permit and code requirements have been completed and recorded, as necessary.

65.3.10. Submission of a signed, written statement that no damage has occurred to the site as documented by the pre-condition survey report.

65.3.11. Final clean up, including:

1. Sweep and dust all surfaces and wash all finished surfaces to appear new and free of all stains, soil marks, dirt and other forms of defacement.

2. Remove labels that are not required as permanent labels.

3. Clean transparent materials, including mirrors and window/door glass, to a polished condition, removing substances that are noticeable as vision-obscuring materials. Replace broken glass and damaged transparent materials.

4. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of dust stains, films and similar noticeable substances. Except as otherwise indicated, avoid disturbance of natural weathering of exterior surfaces. Restore reflective surfaces to original reflective condition.

5. Wipe surfaces of equipment clean. Remove excess lubrication and other substances.

6. Remove debris and surface dust from limited-access spaces including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics and similar spaces.

7. Wet-mop concrete and clean other hard-surface floors according to manufacturers' recommendations.

8. Vacuum clean carpeted surfaces and similar soft surfaces.

9. Clean plumbing fixtures to a sanitary condition, free of stains including those resulting from water exposure.

10. Clean project site (yard and grounds) of litter and foreign substances. Sweep exterior paved areas to a broom-clean condition; remove stains, petro-chemical spills and other foreign deposits. Rake grounds, which are neither planted nor paved, to a smooth, even textured surface.

65.4. Inspection of the Work for Final Completion: Upon receipt of the Contractor's written notice that the work has been completed, the COTR will inspect the work to confirm Final Completion status and acceptance of the work. As soon as possible after inspection, the COTR will either provide written acknowledgment of final acceptance or advise the Contractor of work not completed or obligations not fulfilled as required for final completion and acceptance.

65.5. Application for Final Payment:

64.5.1. Application for Final Payment shall be submitted only after Final Acceptance has been certified in writing to the Contractor by the COTR. Application shall include final labor data and progress schedule update.

64.5.2. Final Payment will be approved when Final Acceptance has been certified and the following conditions have been met:

1. Certification signed and submitted by the Contractor that all contract requirements, including contract modifications, have been met.

2. Final Release of Claims submitted.

3. Release of assignment of claims or consent of surety submitted, as necessary.

4. All security ID badges and parking permits returned to Smithsonian.

5. As-Built Record Drawings Submitted: During the progress of the work the Contractor shall maintain a complete and up-to-date set of record prints, open to inspection by the COTR at any time. These prints shall provide a complete and accurate as-built record of all changes to the Contract Drawings, including rerouting of runs, relocation of items or control points and all other modifications. The exact location of pipes, conduit or other features concealed underground, under concrete, in chases or above ceilings shall be shown by perpendicular dimensions from at least two available landmarks. As-built drawings shall be neatly marked with colored pencils or ink, marked "As-Built" and signed and dated by the Contractor. Upon completion of the Work and before final payment, the Contractor shall submit the following to the COTR: photographically produced as-built record drawings on 4-mil, double matte, Mylar sheets, sized the same as the contract drawings; electronic copies of as-built record drawings in PDF and DWG formats.

6. As-Built Record Survey of Underground Utilities Submitted: If outside or underground utilities are part of the work, the Contractor shall furnish, to the COTR for approval, an acceptable and accurately dimensioned survey showing location and elevation of underground storage tanks, all utility lines for water, gas, electrical, sewer, steam, etc., including valves, connections and changes in direction, as installed under the contract, within the property lines and outside the building walls. Points where utility lines emerge from the building shall be located from lot monuments. The survey shall be made to scale and must be marked "As-Built" and signed and dated by the Contractor. The Contractor shall furnish an electronic copy of as-built record drawings in PDF and DWG formats to the COTR as well as a copy on a 3-mil, double matte, and Mylar sheet or sheets the same size as the contract drawings

7. As-Built Record Specifications Submitted: The Contractor shall submit one (1) hard copy and a digital (scanned) set of project specifications with annotations to identify any changes made during construction, referencing modification numbers, dates and originators of authorizing letters or memos and other sources of changes. The cover shall be marked "As-Built" and signed and dated by the COTR.

Construction and Demolition Waste Tracking Sheet:
To be submitted with each application for payment for the payment period, and at project completion with total waste data and total percentage of waste diverted from landfill for entire project period.

Project Name:_____
Start Date:_____
End Date: _____

Material Description	**Disposal date**	**Diverted from Landfill or incinerator? (Y/N)**	**Diversion method (Recycled, Salvaged, etc.)**	**Hauler or Destination (submit receipts)**	**Volume (in cubic feet)**	**Weight (in tons)**
Land Clearing Debris						
Gypsum Wallboard Scrap						
Cardboard						
Paper goods						
Beverage containers						
Assorted Plastic						
Wood Pallets						
Asphaltic Concrete Paving						
Concrete						
Brick						
CMU						
Lumber						
Plywood and OSB						
Wood Paneling						
Wood Trim						
Miscellaneous Metals						
Structural Steel						
Rough Hardware						
Insulation						
Roofing						
Doors and Frames						
Door Hardware						
Windows						
Non-Window Glass						
Glazing						

Material Description	Disposal date	Diverted from Landfill or incinerator? (Y/N)	Diversion method (Recycled, Salvaged, etc.)	Hauler or Destination (submit receipts)	Volume (in cubic feet)	Weight (in tons)
Acoustical Tile						
Carpet						
Carpet Pad						
Demountable Partitions						
Equipment						
Cabinets						
Plumbing Fixtures						
Piping						
Piping Supports and Hangers						
Valves						
Sprinklers						
Mechanical Equipment						
Electrical Conduit						
Copper Wiring						
Light Fixtures						
Lamps						
Lighting Ballasts						
Electrical Devices						
Switchgear and Panel boards						
Transformers						
Other:						
				Total Diverted		
				Total Not Diverted		
				Total All Waste = Total Diverted + Total Not Diverted		
				% Diversion Rate* = Total Diverted/Total All Waste		

**Percentage Diversion Rate to be compiled after project completion. Minimum Diversion rate is 50%. Goal Diversion rate is 75%*

END OF SUPPLEMENTARY CONDITIONS FOR CONSTRUCTION

DIVISION 2

SECTION 028200- ASBESTOS

ABATEMENT PART 1 - GENERAL

1.1 Introduction

1.1.1 Perform all planning, administration, execution, and cleaning necessary to safely remove asbestos-containing or contaminated materials.

1.1.2 Approval of or acceptance by the Contracting Officer's Technical Representative (COTR) of various construction activities or methods proposed by Contractor does not constitute an assumption of liability either by the COTR or Smithsonian Institution (SI) for adequacy or adverse consequences of said activities or methods.

1.2 Description of the Abatement Work

1.2.1 The asbestos abatement shall also include, but not be limited to the following:

(a) Notification to regulatory agencies

(b) Regulatory permits, licenses and approvals

(c) Worker health and safety program

(d) Air monitoring

(e) Construction of temporary containment barrier/decontamination enclosures

(f) Preparation for abatement operations

(g) Removal of existing asbestos-containing material

(h) Transport and disposal of asbestos-containing material

(i) Decontamination and cleaning

(j) Application of lockdown encapsulant**s**

(k) Removal of temporary containment barrier/decontamination enclosures

(l) Final job close-out

1.2.2 Summary Listing of Work Locations and Approximate Quantity: The Contractor shall review all contract documents and make a site visit to make his/her own determination about quantity values prior to applying for the required federal, state, or local permits from agencies having authority or jurisdiction. PACM is reported as asbestos insulation particles in the dirt in the basement crawl space areas in Building # 30 (142 Administration Drive), Building # 5 (86 Administration Drive) Building # 6 (98 Administration Drive), Building # 7 (110 Administration Drive).

1.2.3 Drawings and Other Information: Drawings of the project area(s) and the reference location(s) within the building may be provided upon request to assist in the Contractor's planning of the abatement work effort for protection of occupants and contents.

1.2.4 Other Work Not Included: Concurrently with this contract, the SI reserves the right to collect and analyze samples or retain an independent testing laboratory to provide supplemental sampling services. These services will in no way relieve the Contractor from compliance liability or from providing the testing required by these specifications or any other requirements of other agencies with jurisdiction authority.

NOTE: The SI has contracted independent air monitoring and testing services. The Contractor shall use a different firm for air monitoring and testing on this project.

1.3 Definitions

1.3.1 Abatement: Procedures to control or eliminate fiber release from asbestos-containing building materials, to include encapsulation, enclosure and removal.

1.3.2 Abatement Work Area (regulated area): An area established by the employer to demarcate areas where Class I, II, III and IV asbestos work is conducted, and any adjoining area where debris and waste from such asbestos work accumulate; and a work area within which airborne concentrations of asbestos, exceed or there is a reasonable possibility they may exceed the

permissible exposure limit.

1.3.3 Airlock: A system of enclosures within the containment area consisting of two (2) doorways, curtained with polyethylene sheeting, at least 1 meter apart.

1.3.4 Air Filtration Units: A local exhaust unit, utilizing high-efficiency particulate air (HEPA) filtration and capable of maintaining a minimum negative pressure differential of
0.05 mm of water within the containment barrier with respect to that of the environment surrounding the containment barrier. The unit also cleans recirculated air or generates a constant air flow from adjacent areas into the abatement work area through the decontamination enclosure.

1.3.5 Air Monitoring**:** The process of measuring the fiber content of a specific volume of air during a stated period of time.

1.3.6 Air Pressure Monitoring: The process of measuring the air pressure differential between the containment barrier and the surrounding area using a micromanometer unit.

1.3.7 Amended Water: Water to which a surfactant (wetting agent) has been added to increase the ability of the liquid to penetrate asbestos containing materials (ACM).

1.3.8 ANSI**:** American National Standards Institute.

1.3.9 ASTM**:** American Society for Testing and Materials. Asbestos: Asbestiform varieties of chrysotile, amosite, crocidolite, tremolite, anthophyllite, and actinolite.

1.3.10 Asbestos-Containing Material (ACM): Any material containing more than 1% asbestos by volume of any type or mixture of types.

1.3.11 Authorized Person: Any person authorized by the SI and required by work duties to be present in a regulated area.

1.3.12 Caulking: High-grade rubber base caulk for masonry and/or for other materials to be used or existing, as appropriate.

1.3.14. Class I Asbestos Work: Activities involving the removal of thermal systems insulation (TSI) and surfacing ACM and presumed asbestos containing materials (PACM).

1.3.15. Class II Asbestos Work: Activities involving the removal of ACM which is not TSI 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 mastics.

1.3.16. Class III Asbestos Work: Repair and maintenance operations, where ACM, including TSI and surfacing ACM and PACM, is likely to be disturbed.

1.3.17. Class IV Asbestos Work: Maintenance and custodial activities during which employees contact but do not disturb ACM or PACM and activities to clean up dust, waste and debris resulting from Class I, II and III activities.

1.3.18 Clean Room: An uncontaminated area or room which is part of the abatement worker/equipment decontamination enclosure, with provisions for storage of workers' or visitors' street clothing, protective equipment and uncontaminated materials and equipment. It may be used for changing clothes.

1.3.19 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, the competent person shall have successfully completed training for Class I, Class II, Class III, and Class IV projects meeting the criteria set forth in the EPA Model Accreditation Plan (40 CFR 763) for project designer or supervisor, and operations and maintenance training.

1.3.20 Containment Barrier: A temporary enclosure constructed with fire-retardant plastic sheeting, suitable framing, tape (as defined in 1.3.52) and other adhesives within the abatement work area. This barrier serves to confine the asbestos abatement and decontamination work, and to contain the release of asbestos containing dust and debris through the action of pressure differential ventilation and air filtration systems. The only entrance is via the abatement worker/equipment decontamination enclosure.

1.3.21 COTR (Contracting Officer's Technical Representative): An individual representing the SI as the technical advisor to the SI's Contracting Officer. This individual may be an employee of the SI or consultant.

1.3.22 Critical Barrier: Those portions of the containment barrier which represent the minimum structural components necessary to maintain the asbestos removal area in airtight isolation from the surrounding areas. Critical barriers shall be placed at floors, windows, ventilation louvers and other openings as necessary to achieve abatement work area isolation before putting up the double-layer plastic sheeting containment enclosure within which abatement work is

performed. If a temporary plastic sheeting/stud wall must be erected, it shall be treated as a critical barrier. The double-layer plastic sheeting containment enclosure shall then be erected on that wall. Wrappings on lights, control boxes, etc., do not constitute part of the critical barrier.

1.3.23 Curtained Doorway: A minimum 2-flap passageway to allow access or egress from one room to another while permitting minimal air movement between the rooms of the decontamination enclosure system. It is constructed by placing 2-3 overlapping sheets of plastic sheeting at least three feet wide over an existing or temporarily framed doorway. The sheets shall be weighted at the bottom so that they close quickly after being released.

1.3.24 Decontamination Enclosure: A series of connected rooms with curtained doorways between each room, for the decontamination of the abatement workers and equipment/materials. A decontamination enclosure contains a minimum of three (3) separate rooms (typically with airlocks located between the rooms) consisting of an equipment room, shower room, and clean room. The system is constructed of an air- tight, impermeable, temporary barrier. Framing for enclosure shall be metal or fire-retardant pressure impregnated wood.

1.3.25 Disposal Bag: A properly labeled minimum 0.15 mm thick, leak-tight plastic bag used for transporting asbestos waste from the abatement work area to an EPA-approved disposal site for ACM waste.

1.3.26 Disturbance: Contact which releases fibers from ACM or presumed asbestos- containing material (PACM) or debris containing ACM or PACM. This term includes activities that disrupt the matrix of ACM or PACM, render ACM or PACM friable, or generate visible debris. Disturbance includes cutting away small amounts of ACM and PACM, no greater than the amount which can be contained in one standard sized glove bag (as defined in 1.3.29) 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 waste bag which shall not exceed 1.52 m in length and width.

1.3.27 Encapsulant: A material applied after the removal of ACM or to the ACM-edges of partially abated substrates which surrounds or embeds residual asbestos fibers in an adhesive matrix to prevent their release into the atmosphere. Encapsulation for purpose of final lockdown is not to be accomplished until after the project has passed final air clearance tests and the COTR has authorized removal of the containment.

1.3.28 Enclosure**:** Procedures necessary to completely enclose material containing asbestos behind airtight, impermeable, permanent barriers.

1.3.29 Equipment Room: A contaminated area or room which is part of the

decontamination enclosure, with provisions for storage of contaminated clothing and equipment and cleaning supplies for decontamination of equipment. Airlocks are required at all entrances to the equipment room.

1.3.30 EPA**:** United States Environmental Protection Agency.

1.3.31 Excursion Limit: Airborne concentration of asbestos in excess of 1.0 fiber per cubic centimeter of air (1 f/cc), as averaged over a sampling period of thirty minutes.

1.3.32 Fiber: A particulate form of asbestos, 5 micrometers or longer, with a length-to- width ratio of at least 3 to 1.

1.3.33 Fixed Object: A unit of equipment or furniture in the abatement work area which cannot be removed from the abatement work area.

1.3.34 Glove Bag: A pouch, typically constructed of a minimum 0.15 mm thick, 1.5 m x
1.5 m (maximum), transparent polyethylene or polyvinylchloride plastic, with inward projecting sleeve gloves to abate ACM in a sealed micro-environment with designated inlets for amended water and sealant application, and a HEPA filtered vacuum unit attachment. The pouch has capacity for tool storage and to hold removed ACM.

1.3.35 GFCI (Ground Fault Circuit Interrupter): A type of ground fault protection in areas where personnel are at high risk of receiving electrical shocks (for example, in damp locations); makes use of a device designed to trip at a ground current in the milliampere range, i.e., very much below currents that are normally harmful.

1.3.36 HEPA Filter: A High Efficiency Particulate Air (HEPA) filter capable of trapping and retaining 99.97% of all mono-dispersed particles 0.3 micrometer in diameter or larger.

1.3.37 HEPA-Filtered Vacuum Cleaner: HEPA-filtered vacuuming equipment with a filter system capable of collecting and retaining asbestos fibers.

1.3.38 Holding Area**:** A chamber between the washroom and uncontaminated area in the equipment decontamination enclosure system.

1.3.39 Impermeable Waste-Disposal Containers: Suitable to receive and retain any asbestos-containing or contaminated material until disposal at an approved site. The containers shall be labeled in accordance with OSHA Regulation 29 CFR 1910.1001 and 29 CFR 1926.1101. Containers must be both water-tight and

air-tight.

1.3.40 Lockdown: The process of applying encapsulant as a finishing coat to abated surfaces after project has successfully passed final air clearance tests and the COTR has authorized removal of containment.

1.3.41 Movable Object: A unit of equipment or furniture in the abatement work area which can be removed from the abatement work area.

1.3.42 MSHA: Mine Safety and Health Administration:

1.3.43 Negative Exposure Assessment (NEA): A demonstration by the contractor, which complies with the criteria in OSHA 29 CFR 1926.1101(f)(2)(iii), that employee exposures during an operation are expected to be consistently below the permissible exposure limits (PELs). Such assessment is to be used to justify level of respiratory protection to be used on the job.

1.3.44 NESHAPS: National Emissions Standard for Hazardous Air Pollutants.

1.3.45 N.E.C.: National Electrical Code.

1.3.46 NIOSH: National Institute for Occupational Safety and Health.

1.3.47 OSHA: Occupational Safety and Health Administration.

1.3.48 PACM: Presumed Asbestos-Containing Material, meaning thermal system insulation and surfacing material found in buildings constructed no later than 1980.

1.3.49 PEL: Permissible Exposure Limit. An occupational limit of exposure to a chemical substance or physical agent.

1.3.50 Personal Monitoring: Sampling of asbestos fiber concentrations within the breathing zone of an employee. Breathing zone is defined as a radius of 150 mm to 250 mm around the employee's head.

1.3.51 Personal Protective Equipment: Equipment which may consist of coveralls, shoes, gloves, helmet, goggles, and respirator used for protection against asbestos exposure.

1.3.52 Plastic Sheeting: Fire retardant Polyethylene sheet material of specified thickness used for protection of walls, floors, etc., and critical barriers in the

abatement work area.

1.3.53 Protection Factor: The ratio of the ambient concentration of an airborne substance to the concentration of the substance inside the respirator at the breathing zone of the wearer. The protection factor is a measure of the degree of protection provided by a respirator to the wearer.

1.3.54 Respirator: A device designed to protect the wearer from the inhalation of harmful atmospheres and approved by NIOSH or MSHA for a specific category of use.

1.3.55 SI IH - Smithsonian Institution's Industrial Hygienist: An individual serving as the Smithsonian's industrial hygienist. This individual may be an employee or consultant.

1.3.56 Surfactant: A chemical wetting agent added to water to decrease surface tension and improve material penetration.

1.3.57 Tape: Glass fiber or other tape capable of sealing joints of adjacent sheets of plastic (0.15 mm polyethylene) and for attachment of plastic sheets to finished or unfinished surfaces of dissimilar materials under both dry and wet conditions, including use of amended water. Minimum tape width shall be 51 mm.

1.3.58 Warning Labels and Signs: As required by OSHA regulations 29 CFR 1910.1001 and 1926.58.

1.3.59 Waste Water Filters: Discharged liquids shall pass through a primary filter and the output shall be particles 20 microns or smaller. The secondary filter shall have output particles 5 microns or smaller.

1.3.60 Wet Cleaning: The process of eliminating asbestos contamination from building surfaces and objects by using cloths, mops, or other cleaning tools which have been dampened with amended water.

1.4 Regulations and References

1.4.1 Regulations: Contractor shall comply with the most current edition of all federal, state, county, and city codes and ordinances as they apply to the location(s) in which the work is performed. Make available for review at the site one copy of all applicable federal, state, county and city regulations governing the abatement work, including but not limited to:

1.4.1.1 Occupational Safety and Health Administration (OSHA), U.S. Department of Labor

(a) 29 CFR 1910 (General Industry) and 29 CFR 1926 (Construction)
Occupational Safety and Health Standards

(b) 29 CFR 1910.1001 and 29 CFR 1926.1101 Asbestos

(c) 29 CFR 1910.134 Respiratory Protection

(d) 29 CFR 1910.1200 Hazard Communication

1.4.1.2 U. S. Department of Transportation

(a) 49 CFR 171 Subchapter C, Hazardous Materials Regulations

(b) 49 CFR 172 Subchapter C, Shipping Container Specifications

1.4.1.3 U.S. Environmental Protection Agency

(a) 40 CFR 763, Toxic Substances Control Act; particularly Subpart E, Asbestos Containing Materials in Schools

(b) 40 CFR 61, Sub-parts A and M, National Emission Standard for Hazardous Air Pollutants (NESHAPS)

1.4.1.4 District of Columbia Law Title 20 DCMR Section 800. District of Columbia Department of Health.

1.4.1.5 New York City Department of Environmental Protection.

1.4.1.6 New York State Department of Health; New York State Department of Environmental Conservation; New York State Department of Labor.

1.4.1.7 Virginia Department of Labor and Industry; Virginia Department of Professional and Occupational Regulation; Virginia Department of Environmental Quality.

1.4.1.8 Maryland Department of the Environment; Maryland Occupational Safety and Health.

1.4.1.9 Arizona Department of Environmental Quality.

1.4.1.10 Hawaii Department of Health.

1.4.1.11 Florida Department of Environmental Protection.

1.4.1.12 Massachusetts Department of Environmental Protection.

1.4.1.13 American National Standards Institute (ANSI), 1430 Broadway, New York, New York 10018. Telephone (212)354-3300

(a) ANSI Publication Z88.2 Practices for Respiratory Protection

1.4.1.14 American Society for Testing and Materials (ASTM), 1916 Race Street, Philadelphia, PA 19103. Telephone (215) 299-5400

(a) ASTM Standard P-189 Specification for Encapsulants for Friable Asbestos Containing Building Materials Proposal

1.4.1.15 Compressed Gas Association, Inc. New York. Pamphlet G-7 "Compressed Air for Human Respiration", Specification G-7.1 Commodity Specification for Air"

1.4.1.16 Canadian Standard Association (CSA), Rexdal, Ontario, Standard Z180.1, "Compressed Breathing Air".

1.5 Submittals

1.5.1 Reference Division 1, Section 01000 Supplementary Conditions for Construction, for additional requirements.

1.5.2 Contractor's Work Plan: The Contractor shall submit a Contractor's Work Plan for asbestos abatement work within 15 calendar days after contract award to the COTR for approval. Approval of the Plan is required prior to beginning abatement work. The Plan shall be on 220 mm x 280 mm paper in a binder indexed by the subjects listed below. Detail the procedures, instructions, and reports used to assure compliance with the contract documents.

1.5.2.1 Bar chart Schedule: Provide bar chart scheduling of the abatement work by daily and/or weekly increments for each abatement work area and individual decontamination enclosure system. The timeline is to include all work, both on and off the job site, for the entire contract period.

1.5.2.2 Notices: The contractor shall notify federal, state, and local regulatory agencies in writing immediately upon contract award and a minimum of 10 days in advance of any asbestos related work. Notifications shall be made by the Contractor as required by USEPA National Emission Standards for Hazardous Air Pollutants (NESHAPS) Asbestos Regulations (40 CFR 61, Subpart M)). Submit copies of

notifications and documentation to the COTR. If a project consists of multi-phases, with distinct start and stop dates, these shall be declared on the EPA Notice or individual notices shall be filed for each phase.

1.5.2.3 Permits and Licenses: Maintain current licenses and obtain applicable permits as required by federal and applicable state or local jurisdictions for the removal, transporting, disposal or other regulated activity relative to the abatement work of this contract. Submit copies of all state and local licenses and permits necessary to carry out the abatement work of this contract.

(a) All asbestos containing waste is to be transported by an entity maintaining a current "Industrial waste hauler permit" specifically for asbestos-containing materials, as required for transporting of waste asbestos-containing materials to a disposal site.

(b) Notices of Violations: Submit copies of all Notices of Violations issued to the contractor and its sub-contractors within the last three (3) years by federal, state, and local regulatory agencies.

1.5.2.4 Sequence of Work: Narrative description of the proposed sequencing of asbestos work and breakdown of abatement work areas requiring separate or individual decontamination enclosures. Include how enclosure systems will be erected and dismantled. Include how re-useable equipment will be cleaned for re- use before relocation or removal from the site. Include how waste disposal containers will be cleaned and removed from the abatement work area.

1.5.2.5 Abatement Work Area Layout Sketch: Layout sketch of decontamination enclosure systems and abatement work area. Describe assembly of construction, materials to be used and location of notices to be posted on the job site. Indicate which areas will be sealed off (and by what means). Show locations of facilities and equipment such as showers, lockers, storage, etc. Show locations of all filtration devices to be used, their exhaust, and calculations to determine the number of these devices needed to provide the minimum 4 air changes per hour in the abatement work area. These requirements shall be coordinated with the COTR and facility representative

1.5.2.6 Isolation of Abatement Work Areas: Methods to isolate/restrict access to abatement work areas. Include how access will be controlled, how building HVAC ventilation systems will be isolated from abatement area. Include how security and fire systems will be

maintained within the containment. Include plans for electrical lock-out and dedicated electrical systems. These requirements shall be coordinated with the COTR and facility representatives.

1.5.2.7 Transportation and Disposal: Details of hauling equipment, materials and contaminated debris from inside the building. Submit written identification of licensed hauler and landfill location.

1.5.2.8 Personnel Organization and Responsibilities: The Contractor shall provide a list of all project personnel, both on-site and in the offices, and a statement of their responsibilities and authority for work on this project.

1.5.2.9 Personal Protective Equipment: Details of personal protective equipment and use, storage and maintenance at job site.

1.5.2.10 Posted Notices and Warning Signs: Submit copies of notices to be posted at the job site, as required by EPA and OSHA regulation for asbestos abatement activities.

1.5.2.11 Materials and Equipment Product Data: Submit manufacturer's literature and written information for all materials and equipment, including NFPA test report of flame-resistant materials, and material safety data sheets for all chemical-content supplies. Contractor shall not change materials or equipment without approval of a new submittal to the COTR.

1.5.2.12 Contractor Monitoring Services: Before start of asbestos work, submit to the COTR the name of the contractor's industrial hygiene consultant and analytical laboratory for air monitoring.

1.5.2.13 Superintendent/Competent Person: Before start of asbestos work, submit to the COTR the name of job site supervisor who must meet the following requirements as a minimum. Furnish documentation that the General Superintendent:

(a) has a minimum of five (5) years on-the-job experience as a supervisor of asbestos abatement projects

(b) is a competent per Section 1.3.15 of this document.

(c) is certified as an Asbestos Abatement Supervisor in accordance with 40 CFR Part 763.

(d) is fluent in the English language and all other primary languages spoken by the abatement work crew.

1.5.2.14 Workers' Specialized Training: Submit training course descriptions, locations, and dates. Submit to the COTR a written affidavit before start of asbestos removal as proof that all employees have had instruction on the hazards of asbestos exposure; and on all aspects of work procedures and personal protection and area protective measures as required and/or recommended by OSHA and EPA and other applicable guide documents. The affidavit shall include course name, designation, installation, place, date taken, and student names.

(a) Training shall be in accordance with 29 CFR 1926.1101.

(b) Course certification shall be in accordance with EPA as required by 40 CFR 763.

(c) Workers should have a minimum of one (1) year experience as an asbestos worker.

1.5.2.15 Respiratory Program: Submit a written respiratory program as defined in OSHA 1926.1101 and in these specifications. Submit type of NIOSH/MSHA certified respiratory equipment intended for each operation required by this project. Selection criteria must meet 29 CFR 1926.1101 (h) (2). When a Type "C" supplied positive pressure air respiratory system is required by the abatement work, submit drawing showing assembly of components into a complete supplied air respiratory system. Include diagram showing location of compressor, filter banks, backup air supply tanks, hose line connections in abatement work area(s), routing of air lines to abatement work area(s) from compressor.

1.5.2.16 Negative exposure assessment data submitted to justify respiratory selection must be less than 12 months old and closely resemble the current project following criteria set forth in 29 CFR 1926.1101 (f) (2) (iii).

1.5.2.17 Emergency Preparedness: Submit an emergency plan to COTR for approval by SI Office of Safety, Health and Environmental Management (OSHEM). The emergency plan shall address responses to fire, accident, power failure, pressure differential system failure, supplied air system failure, or any other event that may require modification or abridgement of decontamination or abatement work area isolation procedures. Show exit routes from the building, locations of the nearest manual pull stations, telephone number of Smithsonian security office, name of the designated employee responsible for fire protection, fire hazards inherent to the project and measures taken for prevention. All

employees shall be familiar with the emergency plan and have initialed the plan after reading it, know how to activate the fire alarm, and trained in the use of portable fire extinguishers. One on-site employee shall be designated as responsible for fire protection. The plan shall be available at the job site in all primary languages of the abatement work crew. In addition, the following emergency information shall be posted at all entrances to the abatement work area:

(a) Exit route map
(b) Phone number of SI security office.

1.6 Daily Reports

1.6.1 The Contractor shall correspond with the COTR for all matters related to this construction project, unless otherwise directed.

1.6.2 All correspondence with the SI shall be in the English language, signed and dated by the Contractor.

1.6.3 Reference General Conditions (Construction Contract Clauses) and Specifications Division 1 for Supplementary Conditions for Construction.

1.6.4 The Contractor shall maintain daily logs and reports of job-site activities and personnel exposure monitoring at the site and shall provide copies to the COTR for inspection upon request.

1.6.5 The Contractor shall maintain daily reports using the SI Contractor's Daily Report form. Reports shall be numbered consecutively, and all sections shall be completed or noted as 'not applicable.' Each day's report shall contain detailed remarks including but not limited to progress on the job, problems discovered, and discussions with Smithsonian staff. Reports shall be submitted to the COTR each day for the previous work day. Copies shall be maintained at the jobsite and made available to the COTR upon request.

1.6.6 Reporting Unusual Events: When an event of unusual and significant nature occurs at site (examples: failure of pressure differential system, rupture of temporary enclosures, equipment or power failure, high airborne fiber reading), prepare and submit a special report listing chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information.

1.6.7 Accident Reporting: Report all accidents to Smithsonian Security Office first, then to the COTR. Prepare reports of significant accidents, at site and anywhere else work is in progress. Record and document data and actions; comply with industry standards. For this purpose, a significant accident is defined to include events where personal injury is sustained, property loss of substance is sustained, or where the event posed a

significant threat of loss or personal injury. Report shall be submitted to the COTR, who will forward copies to OSHEM and the facility Safety Coordinator.

1.6.8 Waste Manifest-Asbestos: At completion of hauling and disposal of each load, submit a copy of waste manifest, chain of custody form, and landfill receipt to the COTR. Waste manifest to be submitted shall be signed by the contractor, waste transporter, and the disposal facility. A copy of all manifests will be included in the post-job submittal.

1.6.9 Waste Manifest-Hazardous Waste: Any hazardous waste generated as a result of asbestos abatement activities will be disposed of by a Certified Hazardous Waste Disposal Contractor. A copy of the Hazardous Waste Manifest generated by this disposal is to be submitted to the COTR, who will forward a copy to the facility's SI Hazardous Waste Coordinator. A copy of all manifests will be included in the post-job submittal.

1.7 Product Handling

1.7.1 Deliver all materials in the original packages, containers, or bundles bearing the name of the manufacturer and the brand name.

1.7.2 Store all materials subject to damage off the ground, away from wet or damp surfaces, and under cover sufficient to prevent damage or contamination.

1.7.3 Remove from the premises all damaged or deteriorated materials. Dispose of materials that become contaminated with asbestos in accordance with applicable regulatory standards and these
specifications.

PART 2 - PRODUCTS

2.1 Materials

2.1.1 Caulking: High-grade rubber base caulk for masonry and/or for other materials.

2.1.2 Encapsulant: Product shall be rated as acceptable for use intended when field tested in accordance with ASTM Proposed Specification P-189 "Specification for Encapsulants for Friable Asbestos Containing Building Materials". Use only materials that have a flame spread index of 25 or less when dry, when tested in accordance with ASTM E-84.

2.1.3 Glove-Bag: 0.15 mm thick, 1500 mm x 1500 mm, transparent polyethylene or polyvinylchloride plastic with long sleeve gloves, designated inlets for HEPA vacuum attachment, and storage pouch.

2.1.4 Impermeable Waste-Disposal Containers: Suitable to receive and retain any asbestos-containing or contaminated material until disposal at an approved site. The containers shall be labeled in accordance with OSHA Regulation 29 CFR 1910.1001 and 29 CFR 1926.1101. Containers must be both water-tight and air-tight.

2.1.5 Plastic Sheeting: Product Standard PS 17-69 and OSHA Regulation 29 CFR 1926.1101; Polyethylene plastic sheeting material 0.15 mm thickness for covering floors and walls, providing air locks, and sealing doors and windows; supply in appropriate

widths to minimize seams. Must be flame-resistant material and must meet test criteria in NFPA 701. Reinforced sheeting is required for applications subject to wear and tear.

2.1.6 Surfactant (Wetting Agent): 50% polyoxyethylene ester and 50% polyoxyethylene ether, or approved equal, shall be mixed with water to provide a concentration of 2 ml surfactant to 1 liters of water, or manufacturer's recommended concentration.

2.1.7 Tape: Glass fiber or other tape capable of sealing joints of adjacent sheets of plastic sheeting and for attachment of plastic sheets to finished or unfinished surfaces of dissimilar materials under both dry and wet conditions, including use of amended water. Minimum tape width shall be 50 mm.

2.1.8 Warning Labels and Signs: As required by OSHA regulations 29 CFR 1910.1001 and 1926.58.

2.1.9 Waste Water Filters: Discharged liquids shall pass through a primary filter and the output shall be particles 20 microns or smaller. The secondary filter shall have output particles 5 microns or smaller.

2.2 Equipment

2.2.1 Air Filtration Units: Shall be factory-sealed and equipped with HEPA filters(final), pre-filters, instrumentation to monitor pressure differential, and safety and warning devices.

2.2.1.1 Provide units with electrical components approved by the National Electrical Manufacturers Association (NEMA) and Underwriter's Laboratories (UL).

2.2.1.2 Access to the units for replacement of all air filters shall be from intake end. Provide units with pre-filters and intermediate filters installed either on or in the intake grid of the unit and held in place with special housings or clamps. The filter media shall be completely sealed on all edges with a structurally rigid frame with a continuous rubber gasket.

2.2.1.3 HEPA Filters: Provide units equipped with HEPA filters. Filters shall be individually tested and certified by the manufacturer.

2.2.1.4 Pre-filters: Provide a two-stage pre-filtration to extend the life of the primary HEPA filter. The first-stage pre-filter is a low-efficiency type effective for particles 100 micrometers and larger. The second stage (or intermediate) filter has a medium efficiency effective for particles down to 5 micrometers.

2.2.1.5 Instrumentation: Provide units equipped with a magnehelic gauge or manometer to measure the pressure drop across filters and to indicate when filters have become loaded and need to be changed. A table indicating the usable air- handling capacity for various static pressure readings on the magnehelic gauge affixed near the gauge for reference, or the magnehelic reading indicating at what point the filters should be changed, noting cubic feet per minute (CFM) air delivery at that point. Provide an elapsed time meter to show the total accumulated hours of operation.

2.2.1.6 Safety and Warning Devices: Provide units with the following safety and warning devices:

(a) Warning lights to indicate normal operation, too high a pressure drop across the filters (i.e., filter overloading), and too low of a pressure drop (i.e., rupture in HEPA filter or obstructed discharge)

(b) GFCIs.

(c) Audible alarm if unit shuts down due to operation of safety systems.

(d) Electrical overload protection sized for the equipment. The motor, fan, fan housing, and cabinet are to be grounded.

2.2.2 Respirators and Respirator Systems

2.2.2.1 Product Data: Must possess NIOSH and MSHA approval for each component in an assembly and/or for entire assembly.

PART 3 - EXECUTION

3.1 Controlled Access to Site

3.1.1 Access to the abatement work area shall be restricted to contractor's workers and authorized visitors as defined in these specifications.

3.1.2 Authorized visitors shall have access to the work site at all times following notification to COTR. Contractor shall supply protective clothing and equipment for visitors as necessary, except for respirators which are to be provided by the visitor in accordance with Section 3.4 of this document.

3.1.3 Contractor shall prominently post signs at all potential entry points to the abatement work area which clearly state: "Restricted Area Under Construction-Admittance by Special Permission Only - Protective Clothing Required Beyond This Point". Immediately inside entry point and outside critical barriers post a warning sign meeting specifications of OSHA 29 CFR 1910 and 1926. Suggested format is a sign of minimum size 508 mm by 356 mm displaying the following legend:

==========

DANGER

ASBESTOS

CANCER AND LUNG DISEASE HAZARD

AUTHORIZED PERSONNEL ONLY

RESPIRATORS AND PROTECTIVE
CLOTHING ARE REQUIRED IN THIS AREA

==========

3.1.4 All workers and authorized visitors shall enter the abatement work area only through the abatement worker/equipment decontamination enclosure, in accordance with Section 3.3 of this document.

3.1.5 All workers and authorized visitors, before entering the abatement work area, shall read and be familiar with all posted regulations, personal protection requirements, and emergency procedures and exit routes.

3.1.6 Contractor shall maintain a daily job site personnel log listing names and social security numbers of individuals who entered the abatement work area, and the times of entering and leaving the area.

3.2 Worker and Visitor Protection

3.2.1 No eating, drinking, smoking, or chewing gum is permitted within the abatement work area. The COTR shall designate a "break area" where these activities, except for smoking, are permitted. Smoking is prohibited in SI facilities.

3.2.2 Workers and Visitors shall be fully protected with respirators and protective clothing during any work which may disturb asbestos-containing materials and result in fiber release. Full protection is not required during pre-abatement inspections of the containment, while work is not being conducted.

3.2.3 Protective Clothing and Equipment: Provide workers and visitors with sufficient sets of protective full body clothing, to include full body coveralls with hood, boots (for workers) and footwear coverings (for workers and visitors), and gloves. Provide eye protection and hard hats as required by applicable safety regulations. Contaminated non- disposal clothing and footwear shall be left in the equipment room until the end of the asbestos abatement work, at which time such items shall be disposed of as asbestos waste or shall be thoroughly cleaned of all asbestos or asbestos-containing material. Contractor shall have at least six (6) sets of disposable protective full body clothing for COTR and authorized visitors for each workday. Provide storage facilities for visitors and workers for removed street clothing in the clean room.

3.2.3.1 Boots: Provide workers non-skid type work boots with protective shields as required by OSHA. Paint uppers of boots with red waterproof enamel paint as a permanent marking that the boots have been exposed to ACM abatement work areas. These boots are to be handled as asbestos-contaminated materials.

3.2.3.2 Hard Hats: Provide hard hats that meet ANSI Z89.1 for use where work is overhead, scaffolding is being used, or as otherwise required by OSHA. Label hats with same warning labels as required for ACM disposal bags.

3.2.3.3 Goggles: Provide goggles that meet ANSI Z87.1 as required by OSHA.

3.2.3.4 Gloves: Provide disposable work gloves for use in the abatement work area.

3.2.3.5 Coveralls with Hood: Provide disposable coveralls with hoods for use in the abatement work area.

3.2.3.6 Respirators: Provide workers with personally issued and marked respirator equipment approved by NIOSH/MSHA and, in accordance with these specifications, suitable for the asbestos exposure level in the abatement work area. Where respirators with disposable filters are employed, provide sufficient filters for replacement as necessary by the abatement worker, or as required by the applicable regulation. Authorized visitors must provide their own respirators, with fresh filters or cartridges as necessary, to enter the abatement work area. These are minimum requirements. Section 3.4 of this document is to be consulted for more detail.

3.3 Abatement Work Area Entry and Exit Procedures

3.3.1. Each time the abatement work area is entered remove all street clothes in the Clean Room of the Decontamination Enclosure and put on new disposable coveralls, new head cover, and a clean respirator. Proceed through shower room to equipment room and put on work boots.

3.3.2 Each time the abatement work area is exited, the following procedures shall be followed:

3.3.2.1 Before leaving the regulated area, employees and authorized visitors shall remove all gross contamination and debris from their protective clothing.

3.3.2.2. Personnel exiting the regulated area shall remove their protective clothing and equipment (except respirators) in the equipment room and deposit the clothing in labeled impermeable bags or containers.

3.3.2.3 Personnel shall remove their respirators in the shower room, washing and rinsing them.

3.3.2.4 Personnel shall shower thoroughly before entering the clean room.

3.3.2.5 After showering, employees shall enter the clean room before changing into street clothes.

3.4 Respiratory Protection

3.4.1 Contractor is hereby advised that asbestos has been determined by the U.S. Government to be a CANCER-CAUSING AGENT. Provide workers with respirators [which, as a minimum, meet the requirements of OSHA 29 CFR 1926.1101] and protective clothing during all phases of the abatement work and

until final air tests are accepted by COTR.

3.4.2 The Contractor shall select respirators from among those jointly approved as being acceptable for protection by the MSHA and the NIOSH under the provisions of 30 CFR Part 11.

3.4.3 The Contractor shall select and provide respirators, at no cost to the employee and shall ensure that the employee uses the respirator provided.

3.4.4 Instruct and train each worker involved in asbestos abatement or maintenance and repair of asbestos-containing materials in proper respiratory use and require that each worker always wear in the abatement work area a respirator, properly fitted on the face. The respirator shall be worn from the start of any operation which may cause airborne asbestos fibers until the abatement work area is completely decontaminated.

3.4.5 Allow an individual to use only those respirators for which training and fit testing have been provided. Require that each time an air-purifying respirator is put on it be checked for fit with a positive and negative pressure fit test in accordance with the manufacturer's instructions or ANSI Z88.2.

3.4.6 For all jobs that involve the removal of thermal system insulation (TSI) or surfacing materials (OSHA definition of Class I work) the employer shall provide respirator protection in accordance with 29 CFR 1926.1101 (h) Table 1 - Respiratory Protection for Asbestos Fibers. This level of respiratory protection shall be maintained until the employer can produce a negative exposure assessment.

3.4.7 For all other abatement work, use respiratory protection appropriate for the fiber level encountered in the abatement work area or as required for other toxic or oxygen- deficient situations encountered. The level of respiratory protection which supplies an airborne fiber level inside the respirator, at the breathing zone of the wearer, at or below the permissible exposure limit (PEL) is the minimum level of protection allowed. (Table 1, Respiratory Protection for Asbestos Fibers, 29 CFR 1926.1101*)* Do not use single-use, disposable, or quarter-face respirators.

3.4.8 Authorized visitors are responsible for providing their own respirator and replacement filters and cartridges, with the exception of Type C which shall be provided by Contractor, and for having been previously and properly trained fit-tested, for the respirator used.

3.4.9 For use with air-purifying respirators, provide, at a minimum, HEPA type filters certified by NIOSH and MSHA for protection against asbestos fibers. In

addition, a chemical cartridge may be added, if required for protection against chemicals used on this job.

3.4.10 For use with powered air purifying respirators, supply a sufficient quantity of HEPA filters approved for asbestos, so workers can change filters at any time that flow through the face piece decreases to the level at which the manufacturer recommends filter replacement.

3.4.11 For supplied-air respirator systems, provide equipment capable of producing air used for breathing in Type "C" supplied air respiratory systems that meets or exceeds standards set for C.G.A. Type 1, Gaseous Air, Grade D. (See 1.5.2.15) System must be certified by NIOSH/MSHA as an approved Type "C" respirator assembly operating in pressure demand mode with a positive pressure face-piece including as a minimum the following:

- Auxiliary backup system
- Escape air supply
- Backup air supply
- Warning Alarm Device
- Compressor Shut Down
- Compressor Motor (electric)
- Compressor Location (outside building)
- Air Intake
- After-Cooler

3.5 Air Monitoring; Stop Action and Clearance Levels

3.5.1 This section describes work being performed by the SI. The SI will not be performing air monitoring to meet Contractor's OSHA requirements for personal sampling or any other purpose. The Contractor is to conduct air monitoring required by OSHA for Contractor personnel.

3.5.2 Analytical Methods: The following methods will be used by the SI in analyzing filters used to collect air samples. Minimum sample volumes will be 1200 liters for clearance samples.

3.5.2.1 Phase Contrast Microscopy (PCM) - will be performed using the OSHA Reference Method, Appendix A to 29 CFR 1926.1101, or NIOSH Method 7400.

3.5.2.2 Transmission Electron Microscopy (TEM) - will be performed using the analysis method set forth in the AHERA regulation 40 CFR Part

763 Appendix A, or NIOSH Method 7402, whichever is deemed more appropriate by SI in each case.

3.5.3 Before Start of Work: The SI will secure abatement work area air samples to establish a base line fiber level in each homogeneous abatement work area before start of work. All samples will be taken at the same time to ensure identical environmental conditions.

3.5.4 Daily: From start of abatement work through project decontamination, the SI may be taking samples on a daily basis inside and outside each abatement work area.

3.5.5 All Clearance Air Samples will be taken using aggressive sampling techniques.

3.5.6 Stop Action: If any air sample taken outside of the abatement work area exceeds 0.01 f/cc by PCM, or 70 structures per mm^2 by TEM, depending on sampling method used, immediately and automatically stop all work except corrective action. PCM air samples will be re-analyzed by TEM to determine whether the high outside-of-work-area results were due to asbestos or non-asbestos fibers. The SI and the abatement contractor will determine the source of the high reading. The contractor will correct the condition, as appropriate.

3.5.7 Abatement Work Area Final Clearance Levels:

3.5.7.1 The SI standard for abatement work area final clearance in all occupied areas for removing the containment and re-occupancy is 70 structures per mm^2 by TEM using the analysis method set forth in the AHERA regulation 40 CFR Part 763 Appendix A.

3.5.7.2 The SI standard for abatement work area final clearance in un-occupied areas, or at the case-by-case discretion of the SI, is less than 0.01 fibers per cubic centimeter of air using PCM methods specified in NIOSH 7400.

3.5.7.3 Final air clearance requirements of specific state and local regulations that exceed the requirements of 3.5.7.1 and 3.5.7.2 will be utilized (e.g., in the District of Columbia, at least two PCM samples per 2,500 square feet of floor are required).

3.6 Initial Isolation of Abatement Work Area

3.6.1 Contractor shall completely separate the abatement work area from other portions of the building, and the outside, by sealing all openings (windows, doorways, corridor entrances, drains, ducts, grill, diffusers, etc.) with barriers of 0.15 mm polyethylene sheeting and tape, or by sealing cracks leading out of the abatement work area. Contractor shall caulk the joints and seal holes in that

portion of the walls, ceiling, and floor inside the abatement work area that could allow airborne asbestos fibers to be carried into adjoining spaces, or the exterior. Note in particular where pipes, conduit, and ductwork penetrate walls, ceilings and floor. Doorways and corridors which will not be used for passage during work must be sealed with 9.5 mm plywood, wood framing and plastic sheeting with tape.

3.6.2 All heating, ventilating, and air conditioning (HVAC) components that are in, supply or pass through the abatement work area shall be shut down. During asbestos removal and until job completion, exhaust fans, and HVAC vents and intakes will be key locked to not operate in the abatement work area.

Coordinate with the COTR and Building Representative which areas are to be shut down and for what duration. Seal all intake and exhaust vents, and seams in system components, with a double layer of 0.15 mm polyethylene sheeting.

3.6.3 If it becomes necessary to shut down electric power to the enclosed abatement work area, then the contractor shall provide temporary power and lighting and ensure safe installation of temporary power sources and equipment in accordance with NFPA 70 electric code requirements.

3.6.4 Arrange for the abatement work area to be locked during non-work hours. Install temporary doors with entrance type locksets that are key lockable from the outside and always unlocked and operable from the inside. Remove deadbolts and padlocks. Provide one key (to be held by SI security office on site) to the COTR.

3.7 Preparation of Abatement Work Area and Temporary Enclosures

3.7.1 Methods for surface decontamination and/or disposal of unsalvageable objects shall be determined with the input from the COTR, the object owner, the contractor and the SI IH.

3.7.2 Clean all contaminated furniture, equipment, and supplies with a HEPA-filtered vacuum cleaner or by wet wiping, as directed by the COTR, prior to being moved or covered.

3.7.3 Before removal, clean by HEPA-filtered cleaner and/or by wet wiping, all electrical and mechanical items, (such as lighting fixtures, diffusers, registers, etc.) and general construction items (such as cabinets casework, door and window trim, moldings, etc.) which cover the surface of the abatement work as required to prevent interference with the abatement work. Reinstall all such materials upon completion of the removal work with materials, finishes, and workmanship to match existing installations before start of work.

3.7.4 Remove all removable furniture, equipment, and supplies that have been deemed by the COTR to be uncontaminated, or completely cover with 2 layers of polyethylene sheeting, at least 0.15 mm in thickness, securely taped in place with duct tape. Such furniture, equipment, and supplies shall be considered outside the abatement work area unless covering plastic or seal is breached.

3.7.5 Clean all surfaces in abatement work area with a HEPA-filtered vacuum cleaner or by wet methods prior to installation of primary barrier.

3.7.6 All critical barriers, including ventilation openings (supply and exhaust), lighting fixtures, doorways, windows, and other openings into the abatement work area shall be individually sealed with 0.15 mm plastic sheeting and tape. If a temporary polyethylene/stud wall must be erected, that wall shall be treated as a critical barrier. The double layer polyethylene containment enclosure shall then be erected on that wall. Critical barriers shall be sealed prior to installation of primary barriers

3.7.7 Take care in sealing of lighting fixtures and control boxes to avoid melting or burning of sheeting. The inside of unsealed lighting fixtures, control boxes, and buss lines are to be cleaned by asbestos workers specially certified to work on high voltage lines.

3.7.8 Cover floor of abatement work area with 2 layers of clear polyethylene, at least 0.15 mm in thickness, turned up at the walls at least 600 mm. Both spray-glue and duct tape all seams in floor covering. Size to minimize seams. Locate seams in top layer 2.0 meters from, or at right angles to, seams in bottom layer. Install sheeting so that top layer can be removed independently of bottom layer. Do not locate seams at wall/floor interface.

3.7.9 Not used.

3.7.10 Cover plastic sheeting in areas where scaffolding is to be used with a single layer of 12.7 mm fire retardant plywood. Wrap edges and corners of each sheet with duct tape.

3.7.11 Cover all walls in abatement work area including critical barrier sheet plastic with primary barrier of 2 layers of 0.15 mm polyethylene sheeting, mechanically supported and sealed with duct tape or spray-glue in the same manner as critical barrier sheet plastic. Size to minimize seams. Seams shall be staggered and separated by at least 600 mm. Wall sheeting shall overlap floor sheeting by at least 406 mm beyond wall/floor joint. Tape all joints including the joining with the floor covering with duct tape or as otherwise indicated by the COTR.

3.7.12 Not used.

3.7.13 Smoke detectors should be protected (but not completely masked) to

avoid nuisance alarms during paint or demolition operations. The covers on the smoke detectors shall be removed directly after such operations and at the end of the abatement workday.

3.7.14 A secondary barrier of plastic as a drop cloth shall be used to protect the primary layer from debris and shall be rolled and disposed as contaminated waste at the end of each workday.

3.7.15 Not used.

3.7.16 A 4.5 kg ABC type portable fire extinguisher shall be located by each exit and clean room.

3.7.17 Install inspection windows in the containment barrier enclosure system walls. Each window shall have a minimum 600 mm x 600 mm viewing area fabricated from 6.0 mm acrylic or polycarbonate sheeting. Install window with top at 2.0 m above floor height in a manner that provides unobstructed vision from outside to inside of the abatement work area. A sufficient number of windows are to be installed to provide observation of all portions of the abatement work area that can be made visible from adjacent areas. Provide also for viewing to be blocked from the inside with opaque plastic flap.

3.7.18 Where the abatement work area is immediately adjacent to or within view of occupied areas, provide a visual barrier of opaque polyethylene sheeting at least 0.15 mm in thickness so that the abatement work procedures are not visible to building occupants. Where this visual barrier would block natural light, substitute frosted or woven rip-stop sheet plastic in locations approved by the COTR.

3.7.19 Provide GFCI protection for all electrical equipment.

3.7.20 Provide temporary lighting inside the decontamination enclosure facility.

3.8 Not used.

3.9 Air Circulation Inside Containment Barrier

3.9.1 Formula for Quantity of Air-Filtration Units: The number of air filtration units needed to achieve the required air circulation rate shall be determined by the following formula:

==========

CALCULATE Volume of abatement work area (CF)

MULTIPLY BY	Number of air changes per hour, four to ten.
MULTIPLY BY	1/60 (hr/minutes)
DIVIDE BY	Capacity of air filtration unit fully loaded with all filters (pressure differential activates warning light for loaded filters)
DIVIDE BY	80% expected efficiency
ADD	one additional unit as backup for machine failure or shutdown
EQUALS	minimum number of units required

==========

3.9.2 Supplemental Makeup Air Inlets: As necessary to achieve air flow throughout the abatement work area, locate auxiliary makeup air inlets as far away as possible from the air filtration units, preferably near the ceiling and away from barriers that separate the containment barriers and enclosures from surrounding areas. Cover inlet with plastic sheeting flaps to reseal automatically if the pressure differential system should shut down for any reason. Provide rigid framing around the opening. Spray the flap and around opening with spray adhesive so that if flap closes, the meeting surfaces are both covered with adhesive. Use adhesive that forms contact bond when dry. If used during clearance monitoring, tape or seal HEPA filters over inlets.

3.9.3 Penetrations through masonry and/or fire walls, required for improving air circulation, shall be protected with a fire damper.

3.9.4 Accomplish the pressure differential by exhausting a sufficient volume of HEPA filtered air from the abatement work area. Efforts to achieve pressure isolation shall first address:

3.9.4.1 Establishing required air circulation

3.9.4.2 Verifying seals are complete as practical

3.9.4.3 Establishing increased pressure in adjacent areas, if available

3.9.4.4 Exhausting sufficient volume of HEPA filtered air with

additional air filtration units.

3.9.4.5 Decreasing the size of abatement work area to affect a smaller volume required for filtration

3.10 Placement of Air Filtration System Units

3.10.1 Equipment shall be located so as to optimize air movement throughout the abatement work area by positioning air filtration units as far away as practical from the access opening or other supplemental make-up air inlets.

3.10.2 The auxiliary air-filtration unit shall be located on site and available and ready to run at any time.

3.10.3 Air movement shall be established in such a way that air borne fibers will be carried away from workers' breathing zones.

3.10.4 Dead air pockets shall be minimized by proper ducting of make-up air if necessary, and by optimum location of the negative air filtration units.

3.10.5 The Contractor shall use smoke tubes to determine if dead air spots are present, and shall take corrective action as outlined above when they are found. Report such actions to the COTR immediately.

3.10.6 The air filtration units shall be placed so that access for changing the filters is inside the containment barrier. The unit is to run continuously during filter changing. A supply of filters shall be kept on site outside of containment area. If a unit must be turned off for servicing, an auxiliary unit must be in place and turned on.

3.10.7 Vent to the outside of the building, whenever practical, as determined by the COTR. Units may be vented inside the building only if outside venting is impractical. Units venting inside a building must be vented through an expansion chamber or diffuser system (self-contained water baffle) to reduce exhaust air velocity. A secondary HEPA unit may also be used after the expansion chamber/diffuser. Terminal exhaust ductwork must be placed as far away as possible from occupied areas. Special provisions for air monitoring shall be implemented by the SI air monitoring firm.

3.10.8 Mount units to exhaust directly or through disposable ductwork. Use ductwork and fittings of same diameter or larger than discharge connection on fan unit. Use spiral wire-reinforced flex duct in lengths not greater than 15 meters. If direction of discharge from fan unit is not aligned with duct use sheet metal elbow to change direction. Use six feet of spiral wire reinforced flex duct after

direction change.

3.10.9 All HEPA units shall be tested in-place before removal begins. Test will be the responsibility of the contractor.

3.11 Pressure Differential Isolation

3.11.1 The abatement work area and the decontamination enclosure system shall be maintained at a negative pressure relative to adjacent areas. The relative pressure differential when measured across any physical or critical barrier must continuously equal or exceed a static pressure of 0.5 mm of water. Measurement shall be by manometer or magnahelic gage.

3.11.2 Minimum 4 air changes per hour. Continuous HEPA filtered exhaust unit is to be in operation until job is completed.

3.11.3 Make-up air shall be obtained only through the decontamination enclosure facilities, or as provided in Section 3.9.2 of these specifications.

3.11.4 Where asbestos-containing material covers an opening or joint, provide negative air pressure sufficient to draw air from the adjoining space into the containment barrier when the opening or joint is exposed after asbestos removal. Seal newly exposed openings and joints immediately to prevent contamination of adjoining spaces.

3.11.5 Supply sufficient pre-filters to allow frequent changes.

3.11.6 During and after the pre-abatement test, run the air filtration units continuously to maintain a constant pressure differential and air circulation until decontamination, cleaning, and encapsulation of the abatement work area is complete.

3.11.7 The HEPA-filtered units shall be left on continuously until after final clearance air measurement of 0.01 f/cc or the pre-removal background level, whichever is lower is achieved, and the COTR authorizes the shut-down of the units. Where feasible, the units shall be left on until the enclosure is completely removed.

3.11.8 HEPA units must be set up to cause an alarm-bell or buzzer to sound should the HEPA filter become clogged or the exhaust unit fails in operation after working hours. The alarm must be loud enough to alert a SI Security Officer of the equipment failure. The guard will phone a previously designated contractor employee whose 24-hour number shall have been recorded at the beginning of the project. The notified contractor will immediately dispatch a repair crew to the

job site. A spare HEPA unit shall always be available to immediately restore negative air pressure.

3.11.9 If the pressure differential between inside and outside the containment barrier drops to 0.4 mm of water, the Contractor will immediately inspect the containment for sources of pressure leaks and report actions taken to the SI IH and COTR. The system warning alarm shall sound if pressure drops below 0.03 mm of water, and work shall stop.

3.12 Pre-Abatement Inspection, Testing, and Approval

3.12.1 Pre-Abatement Testing Requirements: Contractor must demonstrate with continuous data log that abatement work area can hold negative pressure of 0.5 mm of water for a minimum of 2 hours, prior to commencement of actual asbestos removal, unless the system is exhausted through an isolated ventilation system. In this case, the test period shall be long enough to ensure that the lock-out ventilation controls are not over ridden and the HVAC system does not reactivate. As a minimum, the Contractor shall make all arrangements and demonstrate satisfactory equipment operation and set-up for compliance with these specifications.

3.12.1.1 Show proper condition of equipment seals including results of in-place HEPA-filter testing.

3.12.1.2 Show proper operation of safety and warning devices.

3.12.1.3 Show proper operation and calibration of instrumentation.

3.12.1.4 Show identification of equipment unit and fan capacity.

3.12.1.5 Use smoke tubes to demonstrate adequate air circulation, elimination of dead air pockets, and positive air motion through the decontamination enclosure system into the abatement work area.

3.12.1.6 Show the installation method for pre-filters and the HEPA primary filter in the air filtration unit. Show supply of filters available on site.

3.12.1.7 Demonstrate and record that a minimum 0.50 mm of water pressure differential has been achieved and can be maintained.

3.12.1.8 Demonstrate procedures for how workers will enter and exit the decontamination enclosure system.

3.12.1.9 Demonstrate procedures for handling emergencies and for the prevention of contamination of surrounding areas.

3.12.1.10 With COTR and Building Representative, identify disabled building ventilation systems and the positive means that will prevents accidental or premature restarting. Confirms means to have unit restarted at the conclusion of the abatement work. With COTR and Building Representative, verify that all equipment affected is secured at the main breaker.

3.12.1.11 Not used.

3.12.1.12 Use a pressure differential meter or manometer to demonstrate the required pressure differential at every barrier separating the abatement work area from the balance of the building, equipment, ductwork or outside.

3.12.1.13 Demonstrate that each air filtration unit is serviced by a dedicated minimum 115V-20A circuit with GFCI protection.

3.12.1.14 Demonstrate how asbestos will be removed and bagged for transport. Identify procedures for hauling through the building to the loading dock.

3.13 Maintenance of Containment Barrier and Enclosures

3.13.1 Ensure that the containment barrier, decontamination enclosure rooms, and other sealed doors, vents, etc., and plastic linings are effectively sealed and taped for the duration of the abatement work.

3.13.2 Repair damaged barriers and remedy defects immediately upon discovery. Visually inspect enclosure at the beginning of each work period.

3.13.3 Damaged or deteriorating materials shall not be used and shall be removed from the premises. Material that becomes exposed to and contaminated with asbestos shall be decontaminated or disposed of in accordance with the applicable regulations and special requirements.

3.13.4 Clean debris and residue from inside of the decontamination enclosure system on a daily basis. Damp wipe or hose down all surfaces after each shift change. Clean debris from shower pans on a daily basis.

3.13.5 Maintain floors in the clean room and airlocks as dry as possible to minimize slips and trips. Damp wipe all surfaces twice after each shift change with a disinfectant solution.

3.14 Removal of Asbestos-Containing Materials (ACM) - General

3.14.1 Prohibited Work Practices. The following methods shall not be used for work related to or disturbing asbestos, regardless of exposure level:

3.14.1.1 High-speed abrasive disc saws that are not equipped with point of cut ventilation or enclosures with HEPA-filtered exhaust air.

3.14.1.2 Compressed air used to remove asbestos, or materials containing asbestos, unless the compressed air is used in conjunction with an enclosed ventilation system designed to capture the dust cloud created by the compressed air.

3.14.1.3 Dry sweeping, shoveling or other dry cleanup of dust and debris containing ACM and PACM.

3.14.1.4 Employee rotation as a means of reducing employee exposure to asbestos.

3.14.2 Methods of Compliance. The following engineering controls and work practices shall be used, at a minimum, for all asbestos tasks:

3.14.2.1 HEPA-filtered vacuum cleaners.

3.14.2.2 Wet methods.

3.14.1.3 Prompt cleanup and disposal.

3.14.3 The following work shall be done only after the decontamination facilities have been constructed, the area has been isolated and can be maintained under negative air pressure as specified in the previous section, pre-abatement background sampling has been conducted, and arrangements have been made for disposing waste at an acceptable site.

3.14.4 Start abatement work at a location farthest from the fan units and proceed toward them. If an electric power failure occurs, immediately stop all abatement work and do not resume until power is restored and negative air filtration units are operating again. Immediately notify COTR of occurrence. Any torn or unsealed plastic sheeting shall be immediately repaired. Floor sheeting shall be replaced if damaged.

3.14.5 Not used.

3.14.6 Gross removal of dust and debris from contaminated material, material

containers, and equipment shall be accomplished in the containment barrier before removal to the equipment decontamination room for wet sponging before leaving the abatement work site.

3.15 Not used.

3.16 Not Used.

3.17 Not Used.

3.18 Not used.

3.19 Not used.

3.20 Not used.

3.21 Requirements for Specific ACM and Methods - Contaminated Soils

Saturate dry soil with amended water or a removal encapsulant for a depth of 75 mm. Remove the top 25mm of soil. Start removal at the point of work farthest from the entrance to the soil floor area and proceed toward the entrance. Do not permit traffic into the fresh soil surface. After the entire first layer of soil is removed, completely change coveralls and at the entrance to the soil removal area don clean boot covers. Use amended water to keep the surface of the soil continuously wet throughout removal and decontamination. Remove the second 25 mm of soil in the same manner as the first. Remove the third 25 mm of soil in the same manner as the previous 50 mm.

3.22 Not used.

3.23 Not used.

3.24 Not used.

3.25 Requirements for Specific ACM Methods: Negative Pressure Glove Box Systems

Negative pressure glove box systems shall be used to remove ACM or PACM from pipe runs with the following specifications and work practices:

(a) Glove boxes shall be constructed with rigid sides and made from metal or other material which can withstand the weight of the ACM and PACM and water used during removal.

(b) A negative pressure generator shall be used to create negative pressure in system.

(c) An air filtration unit shall be attached to the box.

(d) The box shall be fitted with gloved apertures.

(e) An aperture at the base of the box shall serve as a bagging outlet for waste ACM and water.

(f) A back-up generator shall be present on site.

(g) Waste bags shall consist of 0.15 mm thick plastic, double-bagged before they are filled, or plastic thicker than 0.15.mm.

Work Practices:

(a) At least two persons shall perform the removal.

(b) The box shall be smoke tested prior to each use.

(c) Loose or damaged ACM adjacent to the box shall be wrapped and sealed in two layers of 0.15 mm plastic prior to the job, or otherwise made intact prior to the job.

(d) A HEPA filtration system shall be used to maintain pressure barrier in box.

3.26 Not used

3.27 Requirement for Specific ACM Methods: Mini Enclosure

A small walk-in enclosure which accommodates no more than two persons may be used if the disturbance or removal can be completely contained by the enclosure with the following specification and work practices.

Specifications:

(a) The fabricated or job-made enclosure shall be constructed of 0.15 mm

plastic or equivalent.

(b) The enclosure shall be placed under negative pressure by means of a HEPA filtered vacuum or similar ventilation unit.

Work Practices:

(a) Before use, the mini-enclosure shall be inspected for leaks and smoke tested to detect breaches, and breaches sealed.

(b) Before reuse, the interior shall be completely washed with amended water and HEPA-vacuumed.

(c) During use air movement shall be directed away from the employee's breathing zone within the mini-enclosure.

3.28 Not used.

3.29 Post Removal: Cleaning and Clearance

3.29.1 Provide general clean-up of abatement work area concurrent with the removal of all asbestos-containing materials. Do not permit accumulation of debris on workspace floor.

3.29.2 Do not perform dry dusting or dry sweeping.

3.29.3 Maintain the minimum required pressure differential of 0.50 mm of water inside the abatement work area enclosure at all times, and until the COTR authorizes the Contractor to remove the enclosure.

3.29.4 During decontamination of smoke detectors, the Smithsonian security office must be contacted for possible nuisance alarms. Care must be taken in the wiping down of the sprinkler heads and smoke detectors so as not to damage them. Smoke detectors must be vacuumed clean as directed by the Fire Alarm Shop, Office of Physical Plant.

3.29.5 Initial Phase Cleanup Sequence

(a) Remove all visible accumulations of asbestos-containing material and debris.

(b) Wet clean and HEPA-vacuum all surfaces in the abatement work area.

(c) Clean all equipment (excluding that which will be needed for further cleaning phases) used in the abatement work area and remove from abatement work area via the Equipment Decontamination Enclosure.

(d) Remove the top layer (secondary barrier) of plastic sheeting, change all air filtration system pre-filters, and proceed with the second cleaning.

(e) Replace all HEPA-filters and pre-filters in air filtration air machines with clean filters. Clean all air filtration machines.

(f) Notify SI IH for observation of cleaning to determine completeness. Plastic sheeting surfaces will be considered clean when free from dust, dirt, residue, film, or discoloration resultant from abatement operations or other activities subordinate to these operations.

(g) Perform no activity in abatement work area for at least 12 hours in order to allow settlement of airborne fibers. No reduction in this settling period will be allowed.

3.29.6 Secondary Phase Cleanup Sequence

(a) Notify SI IH for observation to determine completeness of cleaning.

(c) SI IH will perform a visual observation of the abatement work area in general accordance with ASTM 1368, *Standard Practice for Visual Inspection of Asbestos Abatement Projects.*

(d) If visual clearance is not attained, then subsequent re-cleaning will be required. This sequence will continue until visual clearance is attained.

(e) When visual clearance has been obtained, the plastic barriers down to the critical barriers may be removed.

3.29.7 Final Air Clearance Testing.

(a) SI IH will test for the final air clearance levels, in accordance with 3.5.7 of this specification, when areas have passed the visual clearance phase. Final air testing shall be performed using aggressive air sampling techniques.

(b) Re-clean and continue to clean at Contractor's expense, areas which do not comply with the specified final clearance level.

3.29.8 Consider abatement work areas and all other decontaminated and cleaned areas clean when:

(a) All phases of clean up have been completed and level of cleanliness is approved by COTR.

(b) All asbestos final clearance testing results will be as specified in 3.5.7 of this specification.

3.29.9. After area passes final air clearance dismantle Decontamination Enclosure Systems and thoroughly HEPA-vacuum.

3.29.10 Dispose of debris from removal operation, used cleaning materials, unsalvageable materials used for sturdy barriers, and any other remaining materials. Consider the materials to be contaminated and dispose of accordingly.

3.29.11 The "COTR's Certification of Visual Inspection and Final Air Sampling for Asbestos Abatement" form (see page 35) or equivalent shall be completed, signed by the Contractor, SI IH, COTR and included with the COTR project records. The COTR shall provide written results of all visual inspections and final clearance testing to the facility safety coordinator.

3.30 Not used.

3.31 Containment Barrier Removal

3.31.1 Following area final clearance and lockdown encapsulation, leave pressure differential units running as long as feasible during containment barrier

removal.

3.31.2 Equipment, machinery, scaffolding, tools, etc., within the abatement work area shall not be removed without first being thoroughly cleaned with amended water or in the case of delicate items susceptible to rust, an acceptable substitute.

3.31.3 After the abatement work area is found to be in compliance, the remaining sealed areas and exits are unsealed and the plastic sheeting, tape, and any other trash and debris are disposed of in sealable plastic bags and treated as asbestos waste. The SI IH will conduct a final walkthrough and document results for the COTR.

3.31.4 Before removal from the abatement work area, remove and properly dispose of pre-filter, decontaminate exterior of machine and seal intake to the machine with 0.15 mm polyethylene to prevent environmental contamination from the filters.

3.31.5 The contractor shall patch and paint and repair all damaged areas and restore them to their original, pre-contract condition.

3.32 Waste Disposal

3.32.1 The COTR reserves the right to restrict when containerized ACM will be moved outside of the abatement work area and pass through the building. Times chosen to move containerized ACM in the building shall be during non-public hours and when limited staff is in attendance or under other appropriate conditions as determined by the COTR.

3.32.2 Asbestos-contaminated waste that has been containerized shall be transported out of the abatement work area either through the personnel/equipment decontamination enclosure or through a separate waste load-out enclosure. Waste load-out procedures shall be performed by two teams. The team inside the abatement work area shall clean the outside of properly labeled asbestos waste containers using HEPA vacuums and/or wet wiping, and place them into the waste load-out enclosure. No personnel from the inside team shall exit any further from the abatement work area. The team inside the waste load-out area (wearing protective clothing and respirators) shall retrieve the waste containers from the load-out enclosure, double-bag the waste and pass them to an uncontaminated area outside the enclosure. No unprotected personnel from the outside team shall enter this enclosure. As applicable, routes to the elevator, the elevator itself, and route to covered carts shall be lined with polyethylene sheeting.

3.32.3 For Amosite Fibers: If the material contains amosite fibers, evacuate air

from disposal bags with a HEPA vacuum before sealing.

3.32.4 Water not disposed of with the asbestos-containing materials shall be filtered to remove asbestos fibers and debris before disposal into sanitary sewer.

3.32.5 Do not store containerized materials outside of the abatement work area. Take containers from the abatement work area directly to a sealed truck or dumpster.

3.32.6 Bulk and containerized asbestos waste shall be packed, labeled, and transported according to DOT Regulations 49 CFR 173.216 and 49 CFR 173.240. All removed ACM, plastic sheeting, tape, cleaning material, clothing, and all other disposable material or items used in the abatement work area shall be packed into double bagged sealable
0.15 mm plastic bags or double containerized with one bag and one drum. The bags shall be marked with the labels required by OSHA 29 CFR 1910.1001 and/or 1910.1200, and 1926.1101.

3.32.6.1 If the asbestos waste can reasonably be expected to damage double bagged 0.15 mm plastic bags, the following barrel decontamination procedures shall be followed.

(a) Line barrels with a 0.15 mm plastic liner to prevent leaking of contaminated material from the containers.

(b) As bags are moved out through the decontamination system, wet wipe bags to remove all contamination from them before they are moved into an uncontaminated space.

(c) Place bagged waste into appropriately labeled barrels for transport to landfill.

(d) After bagged contaminated waste is placed in barrels, seal lids on barrels.

3.32.6.2 Minimum labeling

required: First

Label:

==========
== DANGER
CONTAINS ASBESTOS
FIBERS AVOID
CREATING DUST
CANCER AND LUNG DISEASE HAZARD
==========

Second Label:

==========
====== PROVIDE IN ACCORDANCE WITH U.S. DEPARTMENT OF TRANSPORTATION REGULATION ON HAZARDOUS WASTE MARKING. 49 CFR PART 172, SUBPART D: "RQ ASBESTOS NA 2212". PROVIDE A "CLASS 9" LABEL, PER 49 CFR PART 172, SUBPART E.
==========
=

3.32.6.3 Notify COTR prior to removing each trailer or other waste transport from the jobsite.

3.32.6.4 Notify COTR not less than 48 hours prior to the proposed time of delivery of contaminated waste to the landfill. Owner may elect to observe this operation.

3.32.6.5 The Contractor shall transport the approved sealed drums to an approved waste disposal site.

3.32.6.6 Allow only sealed plastic bags or impermeable containers to be deposited in landfill. Leave damaged, broken, or leaking plastic bags in the impermeable container and deposit entire barrel in landfill.

3.32.6.7 Ensure that there are no visible emissions to the outside air from site where materials and waste are deposited.

3.32.7 Contractor shall submit a disposal certificate from the EPA approved landfill confirming final disposal in accordance with EPA standards and regulations before final payment. Retain receipts from landfill or processor for materials disposed of. At completion of hauling and disposal of each load, submit copy of waste manifest, chain of custody form, and landfill receipt to the COTR.

3.32.8 The COTR shall provide copies of all hazardous waste disposal manifests to the facility hazardous waste coordinator.

3.33 Job Close-Out

3.33.1 The Contractor shall submit to the COTR, Post Abatement Drawings to indicate location of the asbestos material removed. If required, the Contractor may edit the Project Drawing to show the actual or additional abatement work completed.

3.33.2 The Contractor shall remove from the site all other debris and rubbish resulting from removal and disposal operations and the temporary construction of containment barriers and enclosures.

3.33.3 The Contractor shall use positive means to demonstrate to the COTR that any building utilities that were temporarily disabled are now in full service. Notify the COTR when disabled building ventilation, systems, electrical power, smoke detectors, building access/egress passages may safely be re-started or used.

**** END OF SECTION 028200 ****

CERTIFICATION OF VISUAL INSPECTION AND FINAL AIR SAMPLING FOR ASBESTOS ABATEMENT

The COTR, Contractor, and SI Industrial Hygienist hereby certify that the abatement work areas have been visually inspected (all surfaces including pipes, beams, ledges, walls, ceiling and floor, plastic sheeting, etc.) and there is no dust, debris, or residue. The COTR also certifies that final air sample results meet abatement work area clearance specifications.

OEDC Project No_____SI Contract No._____

Project Title/Location_____

Date of Inspection_____

Date and results of final air sample

ASBESTOS ABATEMENT CONTRACTOR
Firm_____
Print Name_____
Print Title_____
Signature_____

SI INDUSTRIAL HYGIENIST
Firm_____
Print Name_____
Print Title_____
Signature_____

SI COTR
Firm_____
Print Name_____
Print Title_____
Signature_____

SECTION 028300 - Work Activities Impacting Lead-Containing Materials PART 1 - GENERAL

1.1 INTRODUCTION

A. The Contractor shall perform all planning, administration, execution, and cleaning necessary to safely perform work activities impacting lead-containing materials (LCM). A report of June, 2005 prepared by MACTEC, which may be used as a reference, is available from COTR.

B. The approval of or acceptance by the COTR of various work activities or methods proposed by the Contractor does not constitute an assumption of liability either by the COTR or the Smithsonian Institution for adequacy or adverse consequences of said activities or methods.

1.2 WORK INCLUDED

A. Work activities, e.g., demolition, construction, renovation, abatement, and routine maintenance, that will impact lead-containing material, assumed lead-containing material, or other lead-related hazards.

B. General requirements include, but are not necessarily limited to:

1. Notification to regulatory agencies.

2. Regulatory permits, licenses, and approvals.

3. Worker health and safety program.

4. Establishing appropriate engineering controls and utilizing good work practices to prevent migration of lead in air from work areas and properly cleaning work areas prior to release to other trades workers, SI employees, the public, etc.

5. Contractor shall be responsible for personnel exposure monitoring as required by regulatory agencies for the safety of its employees as indicated in 29 CFR 1926.62.

6. Contractor shall be responsible for retaining a third-party industrial hygienist to provide project monitoring services during work activities that are subject to this specification section.

7. If required in the project scope of work, abatement of existing lead-containing material.

8. If required in the project scope of work, performing the interim control of existing lead-containing material or lead-related hazards.

9. Transport and disposal of lead-containing or lead-contaminated material.

10. Performance of incidental mechanical and electrical work necessary for conducting the Work.

11. Decontamination and cleaning.

12. Removal of engineering controls, including teardown of containment and decontamination unit.

13. Final job close-out.

C. The Contractor shall review all contract documents and make a site visit to make its own determination about quantity values prior to applying for the required federal, state, or local permits from agencies having authority or jurisdiction.

D. Drawings of the project area and the reference locations within the building may be provided by SI upon request, to assist in the Contractor's planning of the Work for protection of occupants and contents.

E. Work not included:

1. Concurrently with this contract, the Smithsonian Institution reserves the right to collect and analyze samples or retain an independent industrial hygiene firm to provide supplemental sampling services. These services will in no way relieve the

Contractor from compliance or liability, nor from providing the testing required by these Specifications, or any other requirements of other agencies with jurisdiction.

2. The Smithsonian Institution has contracted an independent industrial hygiene firm to provide monitoring and testing services. The Contractor shall use a different firm for their personnel exposure monitoring and any other environmental or industrial hygiene related testing performed on this project.

1.3 PERFORMANCE OF WORK

Work activities impacting lead-containing material must be conducted by personnel trained and accredited in accordance with state or federal requirements for the location where the work is being performed. At a minimum lead awareness training must be provided in accordance with OSHA Standard 29 CFR 1926.62, Lead in Construction.

At a minimum, all renovation, repair and painting work disturbing lead-based paint (LBP), or paint that has not been tested for lead content, in pre-1978 SI-owned/leased facilities, housing and child-occupied facilities, must be conducted in accordance with the requirements of the *EPA Final Rule on Lead; Renovation, Repair and Painting Program (RRP)* (40 CFR 745) and rule revisions and regulations of Commonwealth of Virginia. The rule applies to maintenance and repair activities in which 6 square feet or more of paint is disturbed in a room, or in which 20 square feet or more of paint is disturbed on the exterior. Firms/employers performing this work must be certified by EPA as Lead-Safe Certified Firms. Employees/individuals performing this work must be Certified Renovators who are trained by EPA- approved training providers to follow lead-safe work practices. When a state becomes an EPA-authorized state, firms working in those areas shall contact the appropriate state program office to ensure that applicable training, certification, and work practice requirements are being followed.

In addition, firms/employers shall ensure that lead-based paint hazards generated by renovation work are adequately cleaned after renovation work is finished and before the work areas are re-occupied. Visual inspection and dust wipe testing of the work areas after the renovations covered by the RRP rule are required. This clearance examination and dust wipe testing shall be performed by an accredited Dust Sampling Technician, Inspector Technician, or Risk Assessor in accordance with the regulations. The cleaning verification (CV) card testing option for clearance will not be accepted unless approved by OSHEM.

65.1.1. Commonwealth of Virginia

In addition, any work activities impacting lead-based paint in child occupied facilities or target housing, as defined by the Commonwealth of Virginia, must be conducted by a properly licensed contractor with qualified, trained lead workers and supervisors licensed in the Commonwealth of Virginia in accordance with the Commonwealth of Virginia's Lead-Hazard Prevention and Elimination Act of 2008, including Section 8 of the Lead Based Paint Abatement and Control Act of 1996 and properly certified in accordance with the requirements of the *EPA Final Rule on Lead; Renovation, Repair and Painting Program (RRP)* (40 CFR 745). The Commonwealth of Virginia currently defines lead-based paint as any paint or other surface coating containing lead or lead in its compounds in any quantity exceeding 0.5% of the total weight of the material or more than one milligram per square centimeter (1.0 mg/cm2), or in any quantity sufficient to constitute a health or environmental hazard.

Any renovation, remodeling, repair, or demolition on or around any structure with lead-based paint must be performed by workers with a minimum of 16 hours of Lead-Based Paint Abatement Worker training by an EPA and Commonwealth of Virginia accredited training provider. In addition, a project supervisor with a minimum of 32 hours of Lead-Based Paint Abatement Supervisor training by an EPA and Commonwealth of Virginia accredited training provider must be present on site during all aspects of the project work. In addition, all personnel shall possess current lead worker and supervisor licensure from the Commonwealth of Virginia prior to conducting work activities impacting lead-based paint on the project site, unless a written variance is provided by the local jurisdiction and is approved by the COTR.

A. The contractor or subcontractor to conduct work activities impacting lead-based paint (LBP) shall be an Environmental Protection Agency accredited and/or locally accredited lead abatement contractor and shall meet the following requirements:

1. Have a record of not less than five years successful experience in work similar in scope and magnitude to this project.

2. Maintain one Superintendent, to remain on site at all times that work is in progress. Superintendent must be approved by the COTR prior to the start of the Work and shall not be changed without prior approval from the COTR. Superintendent shall be a Competent Person and Lead Abatement Supervisor as defined in the Specifications and as required by OSHA and EPA. The COTR

reserves the right to reject and require replacement of the Superintendent because of lack of required experience, unsatisfactory performance, or if the Superintendent is deemed to be not in the best interest of the project.

3. Provide one experienced, EPA accredited and locally-licensed lead abatement supervisor Foreman for every eight (8) lead abatement workers utilized on the project. The Foremen shall remain inside the work area at all times that work is in progress and shall direct the work of the lead abatement workers while inside the work area. The COTR reserves the right to reject and require replacement of a Foreman because of lack of required experience, unsatisfactory performance, or if the Foreman is deemed to be not in the best interest of the project.

4. Use only trained and experienced lead abatement workers and supervisors to perform the Work. All lead abatement workers and supervisors assigned to tasks within the Smithsonian Institution shall be certified and licensed lead abatement workers and/or supervisors through an EPA and state accredited curriculum.

B. Submittals required by Section 1.6 of this specification shall be signed by an EPA accredited and locally licensed Lead Supervisor or Lead Project Designer.

C. Other work described in the Specifications shall be performed according to applicable codes and standards, federal, state, and local regulations, and the Specifications and drawings.

D. Work activities in SI child-occupied facilities and target housing that impact lead- containing materials must be conducted in accordance with the requirements of the *EPA Final rule on Lead, Renovation, Repair and Painting Program (RRP) (*40 CFR 745*)* and rule revisions.

1.4 DEFINITIONS

A. The following definitions pertain to the Work:

1. Abatement: A measure or set of measures designed to permanently eliminate lead-containing material or lead hazards. Abatement strategies include the removal of lead from a substrate, the

enclosure of lead, the removal and replacement of building components coated with lead, and the removal of lead-contaminated soil or overlaying of soil with a durable covering such as asphalt.

2. Action Level: The level above which several OSHA requirements are initiated, including, but not limited to: personnel exposure monitoring, medical surveillance, and lead training and education. The current OSHA Action Level is 30 micrograms per cubic meter (μg/m3) calculated as an 8-hour time-weighted average (TWA) without regard to the use of respiratory protection.

3. Airlock: Two curtained doorways spaced a minimum of 1.0 meter apart which form an airlock in the decontamination unit.

4. Air Filtration Unit: A local exhaust unit, utilizing HEPA filtration and capable of maintaining a minimum negative pressure differential of 0.5 mm of water gauge pressure within the containment with respect to that of the surrounding areas. Air filtration units are required in a containment where airborne lead concentrations are expected to exceed the Action Level. The Contractor must submit a negative

initial exposure assessment, as required by these Specifications and OSHA, and shall obtain COTR approval when air filtration units are not provided in work areas that typically require local exhaust as an engineering control.

5. Air Monitoring: The process of measuring the airborne lead content of a specific volume of air during a stated period of time.

6. Air Pressure Monitoring: The process of measuring the air pressure differential between the containment interior and the surrounding area using a micromanometer unit.

7. ANSI: American National Standards Institute.

8. ASTM: American Society for Testing and Materials.

9. Authorized Visitor: A person deemed authorized by the COTR to enter the work area during the Work. Authorized visitors are responsible for providing their own respirators, except where noted in these Specifications, and for having received proper training, medical certification, and fit-testing for the respirator used.

10. Breathing Zone: A hemisphere forward of the shoulders with a radius of approximately 15 to 23 centimeters around the nose and mouth of the face.

11. Certified Industrial Hygienist (CIH): A person who is an industrial hygienist certified in Comprehensive Practice by the American Board of Industrial Hygiene.

12. Clean Room: An uncontaminated area or room which is part of the decontamination unit, with provisions for storage of worker's or authorized visitor's street clothing and protective equipment, and other uncontaminated materials and equipment. The clean room may be used for changing clothes. Extra disposable coveralls and towels can also be stored in the clean room.

13. Cleaning Solution: Solution which contains at least one ounce or five percent trisodium phosphate (TSP) detergent to each gallon of HOT water, or an effective alternate solution approved by COTR.

14. Competent Person: An agent of the Contractor (i.e., the on-site Superintendent/Lead Supervisor) who is capable of identifying existing and predictable lead hazards in the surroundings or working conditions and has the authorization by the Contractor to take prompt corrective actions to eliminate them.

15. Contractor: Any business entity, public unit, or person performing the actual work for a LCM abatement or interim lead control project.

16. Containment: A temporary enclosure constructed with 0.15 millimeter (six-mil) thick plastic sheeting, suitable framing, and duct tape and other adhesives within

the work area. The containment serves to confine the lead related work activities and to contain the release of airborne lead dust and debris through the action of pressure differential ventilation and air filtration units when required by these Specifications. The only entrance is through the decontamination unit.

17. Contracting Officer's Technical Representative (COTR): An individual representing the Smithsonian Institution as the technical advisor to the Smithsonian Institution's Contracting Officer. This individual may be an employee of the Smithsonian Institution or a consultant.

18. Critical Barrier: Those portions of the containment which represent the minimum structural components necessary to maintain the work area in airtight isolation from the surrounding areas. Examples of openings requiring critical barriers include but are not limited to: HVAC vents and diffusers, doorways, windows, floor, wall, and ceiling penetrations, and air plenums. If a temporary polyethylene/stud wall must be erected, it shall be treated as a critical barrier. The double-layer polyethylene containment enclosure shall then be erected on that wall. Wrappings on lights, control boxes, etc., do not constitute part of the critical barrier.

19. Curtained Doorway: A passageway to allow access or egress from one room to another while permitting minimal air movement between the rooms of the decontamination unit. It is constructed by placing three overlapping sheets of
0.15 mm (six-mil) poly at least 1.0 meter wide over an existing or temporarily framed doorway. The sheets shall be weighted at the bottom so that they close quickly after being released.

20. Decontamination Unit: A series of connected rooms with curtained doorways between each room, for the decontamination of the workers, equipment and materials. The system is constructed of an air-tight, impermeable, temporary barrier. Framing for the unit shall be metal, fire retardant pressure impregnated wood, or an acceptable substitute approved by the COTR. A decontamination unit for an interior work area contains a minimum of three separate rooms (with airlocks located between the rooms) consisting of an equipment room, washroom, and clean

room. A decontamination unit for an exterior work area contains a minimum of two separate rooms consisting of an equipment room and a washroom.

21. Disposal Bag: A properly labeled, minimum 0.15 mm (six-mil) thick, leak-tight poly bag used for transporting lead-containing or lead-contaminated waste from the work area to an EPA-approved disposal site.

22. DOP Penetration Test: An ASHRAE recommended test used to measure the percent penetration (equal to 100 percent minus the percent efficiency) of 0.3 μm DOP (di-octyl phthalate) particles through a filter. A HEPA filter has a minimum efficiency of 99.97 percent as measured using the DOP Penetration Test.

23. DOT: The United States Department of Transportation.

24. Encapsulation: Any covering or coating (encapsulant) that acts as a barrier between existing lead-containing material and the environment, the durability of which relies on adhesion and the integrity of the existing bonds between multiple layers of paint, and between the paint and the substrate.

25. Enclosure: The use of rigid, durable construction materials that are mechanically fastened to the substrate to act as a dust-tight, impermeable, permanent barrier between the lead-containing surface coating and the environment.

26. EPA: The United States Environmental Protection Agency.

27. Equipment Room: A contaminated area or room which is part of the decontamination unit, with provisions for storage of contaminated clothing and equipment and cleaning supplies for decontamination of equipment. Airlocks are required at all entrances to the equipment room.

28. Fixed Object: A unit of equipment or furniture in the work area which cannot be removed from the work area.

29. Hazardous Waste: As defined in EPA regulations, hazardous waste is solid waste or a combination of solid wastes that because

of its quantity, concentration, or physical, chemical, or infectious characteristics may cause or significantly contribute to increases in mortality, serious and irreversible or incapacitating but reversible illness, or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed. As defined in the regulations, solid waste is hazardous if it meets one of four conditions: it exhibits a characteristic of hazardous waste; it has been listed as hazardous; it is a mixture containing a listed hazardous waste combined with a non-hazardous solid waste, unless the mixture is specifically excluded or no longer exhibits any of the characteristics of hazardous waste; or it is not excluded from regulation as hazardous waste. Hazardous lead waste is waste that contains greater than or equal to 5 parts per million (ppm) of leachable lead as determined by the toxicity characteristic leaching procedure (TCLP) test, or is waste that is corrosive, ignitable, or reactive and not otherwise excluded.

30. Heat Gun: A device capable of heating lead-containing material causing it to separate from the substrate. The heat stream leaving the gun shall not exceed 590 °C (1,100 °F).

31. HEPA Filter: A High Efficiency Particulate Air filter capable of trapping and retaining 99.97 percent of all mono-dispersed particles 0.3 micrometers in diameter as measured using the DOP Penetration Test.

32. HEPA Vacuum Equipment: HEPA-filtered vacuuming equipment with a filter system capable of collecting and retaining 99.97 percent of all mono-dispersed particles 0.3 micrometers in diameter as measured using the DOP Penetration Test.

33. HUD: The United States Department of Housing and Urban Development.

34. Impact Surface: An interior or exterior surface (e.g., surfaces on doors) subject to damage by repeated impact or contact.

35. Impermeable Waste Disposal Containers: Containers suitable to receive and retain any lead-containing or lead-contaminated material until disposal at an EPA-approved site. The containers shall be labeled in accordance with all applicable regulations and

as directed in these Specifications.

36. Initial Exposure Assessment: For each work activity, the Contractor must submit to the COTR air monitoring data, in accordance with OSHA regulations, from a job similar in scope, magnitude, and methods to the Work. The Contractor shall base the following selections on the initial exposure assessment data: level of respiratory and other personal protection equipment, type of washing facilities provided in the decontamination unit according to the Specifications, and the installation of air filtration units in the containment according to the Specifications.

37. Interim Lead Controls: A set of measures designed to temporarily reduce human exposure or possible exposure to lead-hazards. Interim controls include paint film stabilization, encapsulation of lead-containing material, friction and impact surface treatment, dust removal and control, and interim controls of lead-contaminated soil.

38. Lead-Containing Material (LCM): Any material which contains detectable concentrations of lead.

39. Lead-Based Paint (LBP): EPA defines LBP as any paint, varnish, shellac, or other coating that contains lead greater than (>) 0.5 percent by weight as measured by laboratory analysis, or greater than or equal to (>) 1.0 milligrams per square centimeter (mg/cm2), as measured by XRF or laboratory analysis. As state and local jurisdictions may recognize lower concentrations of lead as the definition of LBP, the more stringent, i.e., lower concentration, shall take precedence.

40. Lead Hazard: A condition in which exposure to lead from lead-contaminated dust, lead-contaminated soil, or deteriorated lead-containing surface coatings would have an adverse effect on human health. Examples of lead hazards include the following: deteriorated lead-containing paint, lead dust levels above applicable lead dust standards, and bare lead soil levels above applicable lead soil standards.

41. Lead Supervisor: An OSHA Competent Person with a minimum of three years of lead abatement experience. Must be an EPA

accredited supervisor licensed by the appropriate jurisdiction as a lead supervisor. This experienced, accredited, licensed supervisor is required to be present on-site full time during all lead work activities.

42. Lead Project Designer: An individual who has been trained by an accredited training program, as defined by Section 745.233 of EPA Title 40 and certified by EPA pursuant to Sec. 745.226 to prepare lead abatement project designs, occupant protection plans, and abatement reports. The project designer shall also be licensed if required by state and local jurisdiction regulations.

43. Lead work activities: Any work activities which may impact or may potentially impact lead-containing material. Examples of work activities include, but are not limited to: renovation, gross demolition, selective interior demolition, removal of building components, abatement, and surface stabilization.

44. Lead work area: Work area where lead work activities are being conducted. The area shall be temporarily demarcated with OSHA approved barrier tape or other physical barriers such as six-mil polyethylene, plywood, etc. The lead work area can also be a "regulated area" if the airborne lead concentrations inside the area are expected to exceed the OSHA Action Level.

45. Microgram (µg): The prefix "micro-" means one millionth of (1/1,000,000 of). A microgram is one millionth of a gram.

46. Mil: Equal to 0.025 mm, or one thousandth of an inch.

47. Milligram (mg): The prefix "milli-" means one thousandth of (1/1,000 of). A milligram is one thousandth of a gram.

48. Movable object: A unit of equipment or furniture in the work area which can be removed from the work area.

49. MSDS: Material Safety Data Sheet.

50. NEC: National Electrical Code.

51. NFPA: National Fire Protection Association.

52. Negative Exposure Assessment (NEA): Air monitoring results which demonstrate that employee exposure during an operation is expected to be consistently below the Permissible Exposure Limit (PEL). The air monitoring and analysis must have been performed in compliance with applicable standards. The data must be from operations performed within the previous 12 months, during operations conducted under workplace conditions "closely resembling" the processes, type of material, control methods, work practices, and environmental conditions currently used, and conducted by employees whose training and experience are no more extensive than that of employees performing the current job.

53. NIOSH: National Institute for Occupational Safety and Health.

54. OSHEM: The Smithsonian Institution Office of Safety, Health and Environmental Management.

55. Off-site paint removal: The process of removing a component from a building and stripping the paint from the component at an off-site paint-stripping facility.

56. O&M (Operations and Maintenance): Work that will generate or disturb a moderate amount of lead-contaminated dust and debris, but neither the quantities nor the duration of effort that warrants full-scale work area preparation and worker protection. A moderate amount of lead-contaminated dust is clearly visible, may contain debris and paint chips, but will not spread beyond a small area drop cloth to any other surface in the room. Airborne concentrations of lead must be maintained below the OSHA Action Level to be considered as O&M activities. Work classified as O&M includes:

    a. Sawing with manual or power tools up to 0.1 square meter.

    b. Undercutting, rounding or edge-planning one or two painted wood doors using power tools.

    c. Prying open doors, windows, and drawers that have been

completely shut around the edges.

d. Drilling holes, such as those needed to pass rigid conduit through a wall.

e. Changing hardware on doors or other structural components.

f. Work techniques that have not been classified, must be submitted and approved by the COTR.

57. OSHA: Occupational Safety and Health Administration.

58. Paint Film Stabilization: An interim control method, consisting of the wet scraping of loose and flaking paint, and priming and repainting surfaces covered with lead-containing material.

59. Patch Test: A test method or procedure to assess the adhesion of an encapsulant to a substrate covered with a lead-containing surface coating.

60. Permissible Exposure Limit (PEL): The level above which special precautions and procedures must be implemented for the protection of personnel within the work area; set by OSHA at 50 µg/m3 calculated as an 8-hour TWA without regard to the use of respiratory protection.

61. Personal Monitoring: Sampling of the airborne lead concentrations within an employee's breathing zone, to determine the eight-hour time-weighted average (TWA).

62. Personal Protective Equipment: Equipment for protecting the eyes, face, head, and extremities. Personal protective equipment includes protective clothing, respiratory devices, and protective shields, and is used when hazards capable of causing bodily injury or impairment are encountered.

63. Plastic Sheeting: Plastic sheet material manufactured of polyethylene or polyvinylchloride of specified thickness used for protection of walls, floors, etc., and used to seal openings into the

work area. Also known as “poly sheeting” or “poly”. All poly used for Smithsonian Institution projects shall be fire retardant and a minimum of 0.15 mm (six-mil) in thickness.

64. Protection Factor: The ratio of the ambient concentration of an airborne substance to the concentration of the substance inside the respirator at the breathing zone of the wearer. The protection factor is a measure of the degree of protection provided by a respirator to the wearer.

65. Regulated Area: An area established to demarcate areas where airborne concentrations of lead exceed or can reasonably be expected to exceed the OSHA Action level. The regulated area may take the form of a containment or an area demarcated by barrier tape or some other physical barrier that controls the number of personnel who may be exposed to lead. Also referred to as the 'Lead Work Area' in these Specifications.

66. Representative Sample: A collection of the various components of an item or group of items in the same proportion as is found in the entire bulk of the item or group of items.

67. Resource Conservation and Recovery Act (RCRA): The primary federal statute governing waste management from generation to disposal. RCRA defines the criteria for hazardous and non-hazardous waste.

68. Respirator: A device designed to protect the wearer from the inhalation of harmful atmospheres and approved by NIOSH for a specific category of use.

69. Smithsonian Institution Industrial Hygienist (SI IH): A third party working directly for the Smithsonian Institution with the responsibility for observing and monitoring the activities of the Contractor to document that proper work practices are used and compliance with federal, state, and local laws and regulations is maintained. The SI IH is authorized to collect lead-in-air, bulk paint, lead wipe, lead soil, and TCLP samples during the project, perform visual inspections of the work area, and to make recommendations for the approval of final clearance upon completion of the project to the COTR for approval. The SI IH

will, in addition to performing routine and special testing necessary to determine general compliance with the Specifications and Drawings, observe and document, on a daily basis, the execution and progress of the Work. The SI IH is not authorized to direct the Contractor nor to act on behalf of the COTR.

70. Substrate: A surface on which paint, varnish, or other coating has been applied or may be applied. Examples of substrates include wood, plaster, metal, drywall, brick and block, stone, and concrete.

71. Toxicity Characteristic Leaching Procedure (TCLP): A laboratory test used to determine if excessive concentrations of lead or other hazardous materials could leach from a sample into groundwater; usually used to determine if waste is hazardous based on its toxicity characteristics.

72. Time-Weighted Average (TWA): The average air concentration of contaminants during a particular sampling period. The most common sampling period utilized in abatement work is eight hours, giving rise to the eight hour time-weighted average quoted in many governing regulations.

73. Trisodium Phosphate (TSP) detergent: A detergent that contains trisodium phosphate.

74. Washroom: A room between the equipment room and the clean room in the decontamination unit for employee and equipment decontamination containing either shower or hand washing facilities. The washroom shall contain shower facilities at all times that the airborne lead concentrations exceed or are expected to exceed 50 $\mu g/m^3$ inside the work area; the washroom shall, at a minimum, contain hand washing facilities when airborne lead concentrations are not expected to exceed 30 $\mu g/m^3$ inside the work area. The washroom comprises an airlock. The Contractor shall submit a negative initial exposure assessment as required by these Specifications and OSHA, and shall obtain COTR approval when shower facilities are not provided in the washroom.

75. Whole Component Removal and Replacement: A work activity that entails the removal of building components coated with lead-containing surface coatings (e.g., windows, doors, trim, etc.) and the installation of components free of lead.

76. Wet Cleaning: The process of eliminating loose lead-containing surface coatings from building surfaces and objects by using cloths, mops, or other cleaning tools dampened with water and TSP or other similar detergent. These cleaning tools shall be disposed of as lead-contaminated waste.

77. Window Sill: The portion of the horizontal window ledge, adjacent to the window sash when the window is closed, that protrudes into the interior or the room or from the exterior of the window; sometimes called the 'window stool'.

78. Window Trough: For a typical double-hung window, the portion of the exterior window sill between the interior window sill and the frame of the storm window. If there is no storm window, the window trough is the area that receives both the upper and lower window sashes when they are both lowered; sometimes called the 'window well'.

79. XRF Analyzer: An instrument that determines lead concentration in milligrams per square centimeter (mg/cm2) using the principle of x-ray fluorescence (XRF).

1. 5 CODES, REGULATIONS AND REFERENCES

A. The Contractor acknowledges, by execution of the Contract, its awareness and familiarity with the contents and requirements of the following regulations, codes, standards, and guidance documents and assumes responsibility for the performance of the Work in strict compliance with these documents and for every instance of failure to comply with these documents. The current issue of each document shall govern. Where conflict exists between these documents and the Contract Documents, the more stringent requirements shall apply.

B. The Contractor shall comply with the most current edition of all federal, state, county, and city codes and ordinances as applicable and shall make available for review at the site one copy of all applicable federal, state, county, and city regulations governing the Work, including, but not limited to:

1. OSHA:

29 CFR 1910 General Industry Standards

29 CFR 1910.1025 Lead Standard for General Industry 29 CFR 1910.134 Respiratory Protection

29 CFR 1910.1200 Hazard Communication

29 CFR 1910.245 Specifications for Accident Prevention 29 CFR 1926 Construction Industry Standards

29 CFR 1926.62 Construction Industry Lead Standard 29 CFR 1926 Subpart L-Scaffolds

29 CFR 1926 Subpart M-Fall Protection

2. United States Environmental Protection Agency:

40 CFR Part 260-279 Standards for the Management of Hazardous Waste 40 CFR Part 745 Lead-Based Paint Activities Regulation

3. United States Department of Transportation (DOT):

49 CFR Parts 171-172 Hazardous Materials Regulations

4. United States Department of Housing and Urban Development (HUD): 24 CFR Parts 35, 36, 37 HUD Lead-Based Paint Regulations

"Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing"

5. National Institute of Building Sciences: Lead-Based Paint:

Operations and Maintenance Work Practices for Homes and Buildings

6. All state requirements which govern lead abatement or interim control work or hauling and disposal of hazardous waste materials.

7. All local requirements which govern lead abatement or interim control work or hauling and disposal of hazardous waste materials.

8. Codes and Standards:

   a. American Society for Testing and Materials (ASTM)

   b. American National Standards Institute (ANSI)

   c. National Institution for Occupational Safety and Health (NIOSH)

1. 6 SUBMITTALS

A. The Contractor shall submit three (3) complete sets of Pre-Job Submittals to the COTR for review at least ten (10) working days prior to commencement of mobilizing or three (3) working days prior to the pre-construction meeting, whichever is earlier. The Work may not proceed until the complete pre-job submittal package has been reviewed and approved by the COTR. The Contractor shall bind pre-job submittals in a three-ring binder with dividers keyed to the following items:

1. A Plan for the Work for approval by the COTR. The Contractor's Work Plan shall be prepared in accordance with OSHA and other applicable regulations, and shall include the following, as a minimum:

   a. A description of specific control methods to be utilized in performing the Work. This shall include all engineering and work practice controls to be utilized during the Work. Contractor must indicate what type of washing facilities (i.e., showers or hand washing) will be installed and if

negative pressure will be created in the containment as required by these Specifications. The work plan shall be specific for each type of work activity impacting lead. Negative Exposure Assessment (NEA) information associated with these activities must be submitted, if the contractor wants to rely on the NEA data with SI's approval.

b. A preliminary bar chart schedule of the Work. The schedule shall include all work, both on and off the job site, for the entire contract period.

c. A layout sketch of the decontamination unit and each work area. Describe assembly of construction, materials to be used and location of notices to be posted on the job site. Indicate which areas will be sealed off and by what means. Show locations of facilities and equipment such as showers, lockers, storage, etc. Show locations of all filtration devices to be used, their exhaust locations, and the calculations to determine the number of devices needed to provide air circulation as required in these Specifications.

d. A written description of methods to isolate/restrict access to the work areas. Indicate how access will be controlled, how building HVAC ventilation systems will be isolated from the work area, and how security and fire systems will be maintained within the work area. Include plans for electrical lock-out and dedicated electrical systems. These requirements shall be coordinated with the COTR and the facility representative.

2. A list of specific protective clothing and equipment to be utilized during the Work.

3. A written respiratory protection plan which includes the following:

a. An initial exposure assessment as defined in these Specifications and required by OSHA. The Contractor shall base the following selections on the initial exposure assessment data: level of respiratory and other personal protection equipment, type of washing facilities provided in the decontamination unit as required by these

Specifications, and the installation of air filtration units in the containment.

b. A proposed respiratory protection schedule indicating the specific respiratory equipment selected for use during the Work

c. Technical data on the different types of respirators to be used in accomplishing the Work. Include model numbers and tested/certified (TC) numbers issued by NIOSH and MSHA.

d. The Contractor's written respiratory program as required by OSHA. The written respiratory program shall provide evidence that each employee assigned to this project is medically certified to wear respiratory protection, has been successfully fit tested, and participates in the respiratory program.

4. A list of all project personnel, both on-site and office, and a statement of their responsibilities and authority for work on this project.

5. The following documentation for each and every employee assigned to the project by the Contractor or subcontractor, regardless of their role on the project. Submit this information as one package per employee, arranged alphabetically.

a. A copy of their EPA accreditation and licensure by the appropriate jurisdiction as a Lead Worker or Supervisor when impacting lead-based paint surfaces or when airborne lead concentrations are expected to exceed the OSHA PEL.

b. A copy of the physician's most recent written medical opinion indicating that the worker is fit to perform the Work and wear the assigned respiratory protection device.

c. Documentation per OSHA 1926.62(1), that shows that the employee has received and understands instruction on the

hazards of lead exposure, personal protective equipment usage, use of decontamination showers and hand washing facilities, the procedures for entering and exiting the work areas, the purpose of the medical surveillance and medical removal programs, and on all aspects of the work procedures and protective measures to be used on this project.

d. An abbreviated resume that states the experience, qualifications, training, and currently held lead licenses for the on-site Superintendent and all Foremen assigned to the project. Furnish documentation that the Superintendent is a Competent Person as defined in these Specifications

6. A copy of the notice of impending lead work activities in writing to the appropriate agencies. If not required, so state by means of a letter of explanation signed by a company officer.

7. Current licenses and permits required by applicable Federal, state, and local jurisdictions for the lead- work activities, transportation and disposal of waste, or other regulated activity relative to the Work.

8. An insurance certificate issued to COTR by the Contractor's insurance carrier listing all coverage as specified in the General Conditions.

9. Copies of Contractor's Certifications and Licenses.

10. Information on the site location and arrangements for transporting and disposal of lead-containing or lead-contaminated waste. Include the following as a minimum:

a. The landfill selected for disposing of the lead-containing or lead- contaminated waste. Include: owner, operator, address, and telephone number of the landfill.

b. Landfill certification that shows that the selected landfill is permitted by a state or federal agency to receive lead waste.

c. Landfill certification that shows that the selected landfill will accept the lead waste.

d. Name of the disposal subcontractor. If a disposal subcontractor will not be used, so state.

e. The waste transporter's certificate of insurance and registration with the EPA. If the Contractor will be transporting the waste, then it shall submit its certification of insurance and registration with the EPA as a licensed Waste transporter.

f. All required permits for the transport and disposal of lead waste. If no permits are required, so state by means of a letter of explanation signed by a company officer.

11. Building permits required for the lead abatement and interim control, construction, or demolition work during the progress of the Work. If no permits are required, so state by means of a letter of explanation signed by a company officer.

12. A written description and sketch of the site specific Security Plan to be utilized on this project.

13. A written Contractor Health and Safety Program specifically designed for this project with evidence of comprehension of this Health and Safety Program by the employees assigned to this project.

14. An Emergency Plan which addresses the Contractor’s responses to the following: fire, accident, power failure, pressure differential system failure, supplied air system failure, or any other event that may require modification or abridgment of decontamination or work area isolation procedures. Show primary and secondary exit routes from the building, locations of the nearest manual pull stations, telephone number of the Smithsonian Institution Security Office, name of the Contractor's designated employee responsible for fire protection, fire hazards inherent to the project, and measures taken for prevention.

15. Evidence that all employees assigned to this project are familiar with the Emergency Plan, know how to activate the fire alarm, and are trained in the use of portable fire extinguishers; one on-site employee shall be designated as responsible for fire protection. The plan shall be maintained and available at the job site, and the following emergency information shall be posted at all entrances to the work area: the exit route map, and the phone number of the Smithsonian Institution Security Office.

16. Manufacturer's literature and written information for all materials and equipment, including encapsulants, primers, and paints. Submit NFPA and ASTM test reports of fire retardant materials, and MSDSs for all chemical- content supplies. Contractor shall not change materials or equipment without approval of a new submittal by the COTR.

17. Copies of notices, signs, and lead caution barrier tape to be posted at the job site, as required by the State, EPA and OSHA regulations for lead work activities.

18. A specimen of the Sign In/Sign Out Log showing the following as a minimum: date, name, social security number, entering and leaving time, company or agency represented and reason for entry for all persons entering the work area.

19. The name and qualifications of the Contractor's industrial hygiene consultant and analytical laboratory for performing personal air monitoring and analysis, as required by OSHA regulations.

20. The qualifications of the Contractor's employee blood monitoring services as required by OSHA regulations.

21. A description of any special techniques, equipment, etc., to be used on the project. If none, so state.

B. The Contractor shall correspond with the COTR for all matters related to this project, unless otherwise directed. All correspondence with the Smithsonian Institution shall be in the English language, signed, and dated by the Contractor.

1. The Contractor shall maintain results at the job site from personal air monitoring and make them available to the COTR for inspection upon request.

2. The Contractor shall maintain daily reports using the Smithsonian Institution Contractor's Daily Report form. Reports shall be numbered consecutively and all sections shall be completed or noted as 'not applicable'. Each day's report shall contain detailed remarks including, but not limited to: progress on the job, problems discovered, and discussions with the Smithsonian Institution's staff. Reports shall be submitted to the COTR each day for the previous work day. Copies shall be maintained at the job site and made available to the COTR upon request.

3. The Contractor shall submit to the COTR revised project schedules and manning schedules for the Work as changes mandate.

4. The Contractor shall report all accidents immediately to the Smithsonian Institution Security Office, then to the COTR. Prepare reports of significant accidents, at site and anywhere else work is in progress. Record and document data and actions; comply with industry standards. For this purpose, a significant accident is defined to include events where personal injury is sustained, property loss of substance is sustained, or where the event posed a significant threat of loss or personal injury. Report shall be submitted to the COTR, who will forward copies to OSHEM and the facility Safety Coordinator.

5. When an event of unusual and significant nature occurs at the site (e.g., failure of pressure differential system, rupture of temporary enclosures, equipment or power failure), the Contractor shall prepare and submit a special report to the COTR listing the chain of events, persons participating, response by the Contractor's personnel, evaluation of results or effects, and similar pertinent information.

C. Post-Job Submittals:

1. A comprehensive listing of personal air monitoring results taken in compliance with the OSHA regulations.

2. A completed copy of the Waste Control Log.

3. Submit, to the COTR, (who is to forward copies to the facility hazardous waste coordinator) copies of the following hazardous waste records for waste generated on SI property and disposed by contract personnel:

   a. Hazardous Waste Manifests (signed by the SI facility hazardous waste coordinator, the waste transporter, and the disposal site)

   b. Proof of recycling for lead coated metals

   c. Notification and Certification Forms

   d. Material Profile Sheet or Characterization

   e. Container Content Sheet

   f. Certificate of Disposal

4. Copies of the completed Sign In/Sign Out Logs showing the following as a minimum: date, name, social security number, entering and leaving time, company or agency represented, and reason for entry for all persons entering the work areas.

5. An alphabetical listing of all employees used on the project and the exact dates on which they were present in the work areas.

6. For each employee that worked on this project, submit a notarized letter stating that blood monitoring has been performed for the employee as required by OSHA and the Specifications.

7. Affidavit of Release of Liens.

8. Certificate of Completion.

1. 7 GENERAL INFORMATION REGARDING LEAD WORK ACTITIVIES

A. Work activities impacting lead that are assumed to expose employees above the OSHA PEL:

1. Manual demolition of structures, which includes interior selective demolition.
2. Dry, manual scraping and sanding.
3. Using a heat gun; and
4. Power tool cleaning with dust collection systems.

B. Contractor shall be responsible for maintaining surfaces free of dust, debris, and paint chips in areas outside of the lead work area where employees decontaminate, eat, or take rest breaks. In addition, egress routes to and from the lead work areas to the exterior of the building must also be free of dust, debris, and paint chips.

C. Non-lead work areas, decontamination areas, and break areas must be pre-cleaned of all visible dust, debris, and paint chips using wet wiping, sweeping, or mopping techniques with TSP or equivalent detergent. If a vacuum is to be utilized, it must be properly equipped with a HEPA filter and be designed for use on abatement projects.

D. Wet sweeping, brushing, or mopping shall only be used in circumstances where vacuuming or other equally effective methods have been tried and found not to be effective as determined by the COTR.

E. Under no circumstances shall dry sweeping, compressed air, or vacuums without HEPA filters be used to clean surfaces of dust, debris, or paint chips inside lead work areas.

F. Contractor may reduce engineering controls, worker personal protection, and training requirements with the permission of the COTR only if they can successfully establish a negative exposure assessment (NEA) in accordance with OSHA Standard 29 CFR 1926.62, paragraph (d) Exposure Assessment and these additional requirements:

1. Personal exposure air sample data must be presented from a minimum of three work shifts for each work activity or task that will be represented.

2. The personal exposure data used as a NEA must be representative of, at a minimum, 25% of the crew performing the work activity and collected during activities that would most likely generate the highest concentrations of airborne lead dust.
3. The work practices and engineering controls utilized during the NEA must be documented in detail and approved by the COTR prior to being used as valid NEA data.

65.1.2. PART 2 - PRODUCTS

2.1 PRODUCT HANDLING

A. The Contractor shall ensure that all materials are delivered in the original packages, containers, or bundles bearing the name of the manufacturer and the brand name, complete with labels and instructions for handling, storing, unpacking, protecting and installing.

B Contractor shall schedule delivery to minimize long-term storage at the site and to prevent overcrowding of construction spaces.

C. The Contractor shall coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft and other losses.

D. The Contractor shall inspect products upon delivery to ensure compliance with the Contract Documents, and to ensure that the products are undamaged and properly protected.

E. The Contractor shall store all materials subject to damage off the ground, away from wet or damp surfaces, under cover sufficient to prevent damage or contamination.

F. The Contractor shall remove from the premises all damaged or deteriorated materials. Dispose of materials that become contaminated with lead in accordance with applicable regulatory standards and these Specifications.

2.2 MATERIALS

A. Any substitution in materials or methods to those specified shall be approved by the COTR prior to use. Any requests for substitution shall be provided in writing to the COTR. The request shall clearly state the rationale for substitution.

B. Chemical Stripping Agent Neutralizer: Chemical stripping agent neutralizers may be used on compatible surfaces only, according to the manufacturer's instructions. Neutralizers shall be compatible with and not harmful to the substrate to which they are applied. Neutralizers shall be compatible with the stripping agent that has been applied to the surface substrate.

C. Chemical Stripping Removers: Chemical removers shall contain no methylene chloride products. Chemical removers shall be compatible with, and not harmful to, the substrate to which they are applied. Chemical removers used on masonry surfaces shall contain anti-stain formulation that inhibits discoloration of stone, granite, brick and other masonry construction. Chemical removers used on interior surfaces shall not raise or discolor the surface being treated.

D. Cleaning Solution: Provide detergent or cleaning agent formulated to be effective in removing lead dust. Follow dilution ratio recommended by the manufacturer's instructions.

E. Encapsulant: Acrylic-based primer and top coat. Primer shall be compatible to the substrate. Acceptable manufacturers shall be pre-approved by the COTR.

F. Impermeable Containers: Shall be suitable to receive and retain lead-containing or lead- contaminated materials until disposal at an approved site, and shall be labeled in accordance with OSHA, EPA and DOT regulations. Containers shall be both air and water tight. Use two types of impermeable containers:

1. Plastic, metal, or fiber drums with tightly fitting lids, lined with 0.15 mm (six- mil) poly; and,

2. 0.15 mm (six-mil) poly bags sized to fit within the lined drums.

G. Plastic Sheeting: Polyethylene plastic material a minimum of 0.15 mm (six-mil) in thickness for covering floors and walls, providing air locks, and sealing doors and windows; supply in appropriate widths to minimize seams. Must be fire retardant, meeting NFPA/ASTM criteria. Reinforced sheeting is required for applications subject to wear and tear.

H. Surfactant (Wetting Agent): Mixture of "Dust-Set Amended Water Base" and water, mixed to the manufacturer's Specifications.

I. Tape: Tape shall be glass fiber or other type capable of sealing joints of adjacent sheets of poly and for attachment of poly sheeting to finished or unfinished surfaces under both dry and wet conditions.

J. Warning Labels and Signs: as required by OSHA.

K. Wood: Must be pressure-impregnated, fire retardant lumber.

L. The Contractor shall provide all other materials (e.g., nails, hardware, etc.) which may be required to construct and dismantle the decontamination system and the barriers that isolate the work area.

2.3 TOOLS AND EQUIPMENT

A. The Contractor shall provide air filtration units that are factory-sealed and equipped with HEPA filters (final), intermediate filters, pre-filters, instrumentation to monitor pressure differential, and safety and warning devices.

1. Units shall be equipped with electrical components approved by the National Electrical Manufacturers Association (NEMA) and Underwriter's Laboratories (UL).

2. Access to the units for replacement of all air filters shall be from intake end. Provide units with pre-filters and intermediate filters installed either on or in the intake grid of the unit and held in place with special housings or clamps. The filter media shall be completely sealed on all edges with a structurally rigid frame with a continuous rubber gasket.

3. Provide units equipped with HEPA filters. Filters shall be individually tested and certified by the manufacturer.

4. Provide a two-stage pre-filtration system to extend the life of the primary HEPA filter. The first-stage pre-filter shall be a low-efficiency type effective for particles 100 micrometers and larger. The second-stage (or intermediate) filter shall have a medium efficiency effective for particles down to 5 micrometers.

5. Where negative pressure enclosures are required on projects, provide units equipped with a magnehelic gauge or manometer to measure the pressure drop across filters and to indicate when filters have become loaded and need to be changed. A table indicating the usable air-handling capacity for various static pressure readings on the magnehelic gauge and the magnehelic reading indicating at what point the filters should be changed, noting quantity of air delivery at that point, shall both be affixed near the gauge for reference. Provide an elapsed time meter to show the total accumulated hours of operation.

B. The Contractor shall equip all circuits for any purpose entering work area with ground fault circuit interrupters (GFCIs). Locate GFCIs exterior to work area so that all circuits are protected prior to entry to the work area. Provide circuit breaker type GFCIs equipped with test button and reset switch for all circuits to be used for any purpose in work area, decontamination unit, exterior, or as otherwise required by applicable regulations. Locate the panel exterior to the work area.

C. The Contractor shall comply with the applicable recommendations of NFPA's "Standard for Portable Fire Extinguishers". Locate fire extinguishers where they are most convenient and effective for their intended purpose.

D. Electrically-operated heat guns shall be flameless electrical paint softener type. Heat gun shall have electronically controlled temperature settings to allow usage below a temperature of 590^0 C ($1{,}100^o$ F). The heat gun shall be DI type (non-grounded) 120 V, AC application. The heat gun shall be equipped with various nozzles to cover all common applications.

E. Machine Sanding Equipment shall be the dual action, rotary action, orbital or straight-line system type, fitted with HEPA filters. Air compressors utilized to operate this equipment shall be designed to continuously provide adequate pressure as required by the manufacturer.

F. Powered Air Purifying Respiratory (PAPR) equipment shall be approved by NIOSH and equipped with HEPA filters.

G. The Contractor shall have available power cables or sources such as generators, where required.

H. Scaffolding, as required to accomplish the Work, shall meet all applicable safety regulations (29 CFR 1926, Subpart L).

I. The Contractor shall provide sufficient temporary lighting to ensure proper workmanship everywhere; by combined use of daylight, general lighting, and portable plug-in-task lighting.

J. The Contractor shall provide transportation, as required, for loading, temporary storage, transit, and unloading of contaminated waste without exposure to persons or property. Use only enclosed or covered trucks to haul waste containers to prevent loss or damage of containers in route to the landfill.

K. Vacuum units, of suitable size and capacities for the Work, shall be equipped with HEPA filters.

L. The Contractor shall utilize airless or low-pressure water sprayers or hand-held spray bottles for amended water application.

65.1.3. PART 3 - EXECUTION

3.1 ACCESS TO WORK AREAS

A. Access to the areas where lead work activities are occurring shall be restricted to the Contractor’s workers and authorized visitors, as defined in these Specifications.

B. Authorized visitors shall have access to the work site at all times, following notification to COTR. The Contractor shall supply protective

clothing and equipment for authorized visitors, as necessary, except for respirators, which shall be provided by the authorized visitor in accordance with these Specifications.

C. Signage for work areas where airborne lead concentrations are known or expected to be above the OSHA Action Level: The Contractor shall prominently post signs at all entry points to the work area which clearly warn that lead abatement or interim control work is being conducted in the vicinity. Immediately inside entry point and outside critical barriers post a warning sign meeting OSHA specification. Minimum sign size shall be 500 mm by 350 mm displaying the following legend:

WARNING LEAD WORK AREA

POISON UNAUTHORIZED ENTRY PROHIBITED

NO SMOKING, EATING OR DRINKING PERMITTED IN THIS AREA

Signs shall be in bold lettering a minimum of 50 mm tall.

D. Signage for lead work areas where airborne lead concentrations are known or expected to be less than the OSHA Action Level: Demarcate work area perimeter with caution tape. At entrance or along perimeter, post signs per OSHA with the following legend:

WARNING LEAD WORK AREA

POISON

NO SMOKING, EATING, OR DRINKING

E. Required signage shall be posted immediately outside all entrances and exits to the lead work area at least 3 days in advance of work except, that in emergency situations, posting shall be done as soon as possible.

F. Where required, all workers and authorized visitors shall enter the work area through the decontamination unit only, in accordance with these Specifications.

G. Before entering the work area, all workers and authorized visitors shall read and be familiar with all posted regulations, personal protection

requirements, and emergency procedures and exit routes.

H. The Contractor shall maintain a daily job site personnel log listing names and social security numbers of individuals who entered the work area, and the times of entering and leaving the work area.

3.2 WORKER AND VISITOR PROTECTION

A. No eating, drinking, smoking, or chewing gum is permitted within the work area. The COTR shall designate a "break area" where these activities, except for smoking, are permitted. Smoking is not permitted in Smithsonian Institution facilities.

B. Workers and authorized visitors shall be fully protected with respirators and protective clothing during any work that may disturb lead-containing material, and which results or may result in airborne concentrations of lead greater than the OSHA PEL. Full protection is not required during pre-abatement inspections of the work area, before abatement or interim control work has begun.

C. The Contractor shall provide workers and authorized visitors with sufficient sets of protective full-body clothing. Such clothing shall consist of full body coveralls, headgear, foot protection, and gloves. Provide eye protection and hard hats as required by applicable safety regulations. Contractor shall have a minimum of six (6) sets of disposable protective full body clothing for COTR and authorized visitors for each workday. Street clothes may not be worn into an abatement or interim control work area. Provide storage facilities for authorized visitor's and worker's street clothing in the clean room. Workers must wear nylon shorts, 'TYVEK' shorts, or an acceptable substitute, under disposable suits.

1. Provide non-skid type work boots with protective shields as required by OSHA.

2. Provide hard hats that meet ANSI requirements for use where work is overhead, scaffolding is being used, or as otherwise required by OSHA.

3. Provide goggles that meet ANSI requirements as required by OSHA.

4. Provide disposable work gloves for use in the work area.

5. Provide disposable coveralls with hoods for use in the work area.

D. Contaminated, non-disposable clothing and footwear shall be stored in a controlled area adjacent to the work area until the completion of the Work. Upon completion of work such items shall be thoroughly decontaminated of all lead-containing or lead- contaminated material or disposed of as lead-contaminated waste.

E. The Contractor shall provide suitable emergency eye flushing facilities within the work area when the eyes of employees may be exposed to injurious corrosive materials or according to OSHA requirements.

F. The Contractor shall provide medical surveillance for all workers according to OSHA requirements.

G. All workers must have baseline and post work blood lead level measurements determined by the whole blood lead method. A worker shall not be permitted to work on the project when three baseline blood sampling tests average greater than 25 μg/dL or if a single test exceeds 30 μg/dL. A formal investigation shall occur whenever a worker's post-work blood lead level rises more than 10 μg/dL above the baseline level.

H. The Contractor shall assure that in areas where employees are exposed to lead above the PEL without regard to the use of respiratory protection, the following hygiene facilities and practices be followed:

1. Clean change areas shall be provided by the Contractor for employees whose airborne exposure to lead is above the Action Level, and as interim protection for employees performing tasks as specified in paragraph (d)(2) of OSHA Standard 29 CFR 1926.62, without regard to the use of respirators;

a. Change areas shall be equipped with separate storage facilities for protective work clothing and equipment and for street clothes, which prevent cross-contamination.

b. The employer shall assure that employees do not leave the

workplace wearing protective clothing or equipment that is required to be worn during the work shift.

2. The Contractor shall ensure that eating areas are as free as practical from lead contamination by;

   a. Assuring that employees wash their hands prior to eating, drinking, smoking, or applying cosmetics.

   b. Not permitting employees to enter eating areas with protective clothing or equipment.

3. Hand washing facilities shall be provided by the Contractor for use by employees exposed to lead in accordance with OSHA Standard 29 CFR 1926.51(f). Where showers are not provided, the Contractor shall assure that employees wash their hands and face at the end of the work shift.

I. Personnel exiting the lead work areas shall use the following decontamination procedures, unless otherwise specified herein:

1. Vacuum off work clothes with HEPA filter equipped vac

2. Remove disposable, protective clothing and place in an OSHA approved impermeable disposal bag

3. Clean exposed skin such as the face, hands, and arms, either in a shower or similar washing facility

4. Change into clean clothing prior to leaving the physical boundary designated around the work area.

3.3 RESPIRATORY PROTECTION

A. The Contractor shall instruct and train each worker involved in the Work in proper respiratory use and require that each worker wear a respirator properly during all operations which may expose the worker at or above the permissible exposure limit (PEL). Respiratory protection shall be used until the work area is completely decontaminated and final clearance

testing has been performed and approved by the COTR.

B. The Contractor shall certify that all workers using respiratory protection have been medically approved to use respiratory protection.

C. The Contractor shall select respiratory protection appropriate for the lead levels encountered in the work area as outlined in OSHA regulations and these Specifications, or as required for other toxic or oxygen-deficient situations encountered. Respirators shall be selected from among those approved by NIOSH.

D. The Contractor shall select and provide respirators to each employee and shall ensure that the employee uses the respirator provided. Allow each employee to use only those respirators for which training and fit-testing have been provided. Require that each time an air-purifying respirator is put on it is checked for fit with a positive and negative pressure fit check in accordance with OSHA regulations (29 CFR 1910.134). Quantitative/qualitative fit-testing shall be repeated at least annually, and at any time a respirator is replaced.

E. Authorized visitors are responsible for providing their own respirator and replacement filters and cartridges, with the exception of Full-Face, Supplied Air Respirators Operating in Pressure Demand Mode which shall be provided by the Contractor. Authorized visitors are also responsible for having received proper training, medical evaluation, and fit-testing for the respirator used.

F. The Contractor shall provide, for use with air-purifying respirators, HEPA-type filters certified by NIOSH for protection against lead dust. Negative-pressure, particulate filters will meet the requirements of 40 CFR Part 84 following its effective date (July 10, 1998). A sufficient quantity of HEPA filters shall be supplied such that workers may change filters at any time that flow through the face piece decreases to the level at which the manufacturer recommends filter replacement or when breathing resistance is occurring. In addition, a chemical cartridge must be added, as required, for protection against chemicals used for the Work.

G. The following respirators are permitted for use for the airborne lead dust levels specified:

1. Half-Face, Air Purifying Respirators equipped with HEPA filters for airborne lead dust concentrations not in excess of 500 μg/m^3 (10 times the PEL).
2. Full-Face, Air Purifying Respirators equipped with HEPA filters for airborne lead dust concentrations not in excess of 2,500 μg/m^3 (50 times the PEL).
3. Powered Air Purifying Respirators (PAPRs) equipped with HEPA filters for airborne lead dust concentrations not in excess of 2,500 μg/m^3 (50 times the PEL).
4. Full-Face, Supplied Air Respirators Operating in Pressure Demand Mode is required when airborne lead dust concentrations are expected to meet or exceed 100,000 μg/m^3 (2,000 times the PEL).

H. Contractor shall not use or allow the use of any single-use, disposable, or quarter-face respirators or any other respirator not approved for use by NIOSH.

3.4 LEAD MONITORING, TESTING, AND ANALYSIS PROCEDURES

A. Laboratories used to conduct lead analyses shall participate in the EPA's National Lead Laboratory Accreditation Program (NLLAP).

B. Inspections and risk assessments performed in SI-owned housing shall be conducted in accordance with HUD's "Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing", Chapters 5 and 7, and 40 CFR 745

C. Sampling for lead-in-paint shall be performed by persons trained and licensed by the appropriate state and local agencies to perform lead inspections. Sampling shall be performed generally following the protocols included in HUD's "Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing", Chapter 7 – 1997 version using either an XRF Lead Paint Analyzer or by bulk paint chip sampling. Analysis of bulk paint chips for lead shall be performed by an accredited laboratory using either Flame Atomic Absorption Spectroscopy (FLAA) or by Inductively Coupled Plasma (ICP).

D. Sampling for lead-in-air shall be performed generally following the "Sampling Airborne Particulate for Lead (NIOSH Method 7082)" procedure as outlined in HUD's "Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing". Analysis of lead-in-air samples shall be performed by an accredited laboratory using either FLAA or ICP methods.

E. Lead dust wipe sampling shall be performed generally following the ASTM method E1728 or "Wipe Sampling for Settled Lead-Contaminated Dust" procedure as outlined in HUD's "Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing". Analysis of lead wipe samples shall be performed by an accredited laboratory using FLAA following NIOSH Modified Method 7082 or by ICP following Modified OSHA Method ID-125.

F. Lead-in-soil sampling shall be performed generally following the procedures outlined in HUD's "Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in

Housing". Analysis of soil for lead shall be performed by an accredited laboratory by FLAA or ICP.

G. Bulk samples of waste for TCLP analysis shall be representative samples of the waste and shall be collected following the procedure indicated by the selected laboratory performing the TCLP analysis. TCLP analysis of representative samples of lead- containing or lead-contaminated waste shall be performed by an accredited laboratory following EPA Method SW-846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods". TCLP samples shall be collected by the SI IH.

3.5 BASELINE TESTING

A. Settled lead dust wipe samples will be collected in interior and exterior work areas by the SI IH prior to Contractor mobilization to the site, construction of the containment area, or any pre-cleaning activities. Baseline lead dust samples will be collected from representative components in the area, and will, at a minimum, include one sample from the following: floor inside the work area, floor outside the work area at the location of the containment entrance, and one window sill and one

window trough inside the work area (actual number and specific locations of samples shall be determined by the SI IH).

B. Lead-in-soil sampling will be performed in the area adjacent to exterior work areas by the SI IH prior to Contractor mobilization to the site, construction of the work area, or any pre-cleaning activities. Baseline lead soil samples will be collected by composite sampling of areas adjacent to each exterior work area (actual number and specific locations of samples shall be determined by the SI IH).

3.6 AIR AND DUST MONITORING

A. The Contractor shall be responsible for performing personal air monitoring as required by OSHA during the Work. The results of such monitoring shall be posted, provided to individual workers, and submitted to the COTR as required in these Specifications.

B. The SI IH will perform airborne lead monitoring on a daily basis for the duration of the work both inside and outside the work area.

1. The Contractor shall utilize work practices and engineering controls that limit the quantity of airborne lead dust inside the work area. The Contractor shall strive to maintain airborne lead concentrations inside the work area below the OSHA Action Level.

2. If any air sample taken outside of the work area exceeds the Action Level of 30
$\mu g/m^3$, the Contractor shall immediately stop all work except corrective actions. The SI IH and the Contractor Superintendent will determine the source of the airborne lead.

C. The SI IH will be performing lead dust sampling at the beginning of the Work and periodically thereafter at the area immediately adjacent to the entrance of each decontamination unit. Results of lead dust samples will be compared to the baseline lead dust concentrations established in these areas (actual number and frequency of lead dust

sampling to be determined by SI IH). If baseline levels are exceeded the Contractor shall immediately stop all work except corrective actions. The

SI IH and the Contractor Superintendent will determine the source of the lead dust.

3.7 GENERAL PREPARATION OF LEAD WORK AREAS

A. Doorways and corridors which will not be used for passage during work shall be sealed with 13 mm thick fire-retardant plywood, fire retardant wood framing, and poly sheeting with tape.

All heating, ventilating, and air conditioning (HVAC) components that are in, supply, or pass through the work area shall be shut down.

B. The Contractor shall provide temporary power and lighting and ensure safe installation of temporary power sources and equipment in accordance with NFPA electric code requirements. Electrical power equipment shall be properly disconnected, locked out, and tagged so that the equipment can be safely serviced during the Work.

C. The Contractor shall arrange for the lead work area to be locked during non-work hours. Install temporary doors with entrance-type lock sets that are key lockable from the outside and always unlocked and operable from the inside. Remove deadbolts and padlocks. Provide one key (to be held by the Smithsonian Institution Security Office) to the COTR.

D. The Contractor shall supply water to the work area as required.

E. Isolation of the work area for O&M work may be modified, as practical, with approval of the COTR, and in accordance with the “Operations and Maintenance Procedures and Controls” section of this specification.

3.8 PREPARATION OF INTERIOR LEAD WORK AREAS WHERE AIRBORNE LEAD CONCENTRATIONS ARE KNOWN OR EXPECTED TO EXCEED THE OSHA ACTION LEVEL

A. Lead Work Area Preparation:

1. The Contractor shall clean and remove items required for access; clean all furniture, equipment, and supplies in the work area with

a HEPA-filtered vacuum or by wet wiping, as directed by the COTR, prior to being moved or covered.

2. The Contractor shall clean, by HEPA-filtered vacuum or by wet wiping, and remove all electrical and mechanical items (e.g., lighting fixtures, diffusers, registers, etc.) and general construction items (e.g., cabinets casework, door and window trim, moldings, etc.) which cover the surface of the Work, as directed by the COTR. Reinstall all such materials upon completion of the Work with materials, finishes, and workmanship to match conditions existing before start of the Work.

3. The Contractor shall remove all removable furniture, equipment, and supplies that have been deemed by the COTR to be uncontaminated or shall completely seal with two layers of 0.15 mm (six-mil) poly sheeting and duct tape. Such sealed furniture, equipment, and supplies shall be considered outside the work area unless the poly seal is breached.

4. The Contractor shall clean all surfaces in the lead work area with a HEPA- filtered vacuum or by wet wiping, as directed by the COTR.

5. The Contractor shall seal all critical barriers, including ventilation openings (supply and exhaust), seams in HVAC system components, lighting fixtures, doorways, windows, , and other openings into the work area with one layer of 0.15 mm (six-mil) poly sheeting and duct tape. If a temporary poly/ wood stud wall must be erected, it shall be treated as a critical barrier.

6. The Contractor shall exercise caution when sealing lighting fixtures and control boxes to avoid melting or burning of poly. The insides of lighting fixtures, control boxes, and buss lines shall be cleaned only by lead abatement workers specially certified to work on high voltage lines.

7. The Contractor shall cover the floor of the work area with two layers of 0.15 mm (six-mil) poly sheeting turned up at the walls at least 600 mm. Spray-glue and duct tape all seams in floor poly. Size to minimize number of seams. Locate seams in the top layer

2 meters from, or at right angles to, seams in bottom layer. Install poly so that the top layer can be removed independently of the bottom layer. Do not locate seams at the wall/floor interface.

8. The Contractor shall cover existing carpeting in the work area with three layers of 0.15 mm (six-mil) poly sheeting. Place one layer of 13 mm fire retardant plywood between the top and middle layers of poly.

9. The Contractor shall cover all walls in the work area, including sealed critical barriers, with two layers of 0.15 mm (six-mil) poly sheeting, sealed with duct tape or spray-glue. Size to minimize number of seams. Seams shall be staggered and separated by at least 600 mm. Wall poly shall overlap floor poly by at least 400 mm beyond wall/floor interface. Tape all joints, including those joining with the floor covering, with duct tape or as otherwise indicated by the COTR.

10. The Contractor shall install an additional layer of poly on the floor as a drop cloth to protect the primary floor layers from debris. The drop cloth shall be rolled and disposed of as lead-contaminated waste at the end of each workday and a new drop cloth installed at the beginning of each workday.

11. The Contractor shall provide emergency exiting from the contained lead work area as required by NFPA. Arrange emergency exit doors to be secure from outside the work area but to permit exiting from the work area. Mark outline of door on barriers with luminescent paint at least 150 mm wide. Hang a utility knife on a string beside outline. Post a sign identifying “EMERGENCY EXIT”, using letters at least 150 mm high, inside outline with luminescent paint. Arrows shall be taped on the poly wall at eye level and at floor level to indicate the location of each exit.

12. At the entrance to the lead work area, the Contractor shall post the building floor plan and escape routes, plus the locations of nearest exits and phone numbers of the Smithsonian Institution Security Office.

13. Where not provided by the Smithsonian Institution, the Contractor

shall provide emergency lighting in accordance with the Life Safety Code.

14. The Contractor shall install a 4.5 kg ABC type portable fire extinguisher by each emergency exit and in the clean room of the decontamination unit.

15. The Contractor shall install inspection windows in the containment walls. Each window shall have a 600 mm x 600 mm viewing area fabricated from 6 mm clear acrylic or polycarbonate sheeting. Install each window with its top at 2 m above floor height in a manner that provides unobstructed vision from outside to inside of the work area. A sufficient number of windows shall be installed to provide observation of the entire work area. Provide for viewing to be blocked from the inside with an opaque plastic flap on each window.

16. The Contractor shall provide GFCI protection for all electrical equipment.

C. At the COTR's approval, the Contractor may perform limited lead work activities utilizing a mini containment to isolate the work area. The mini containment shall be equipped with an adjacent wash area and be sealed at all seems to where it is attached to adjacent work surfaces. The mini containment shall satisfy all requirements for a lead work area as outlined in these Specifications.

D. Creating Negative Pressure in Containment:

1. Negative pressure is required when airborne lead concentrations exceed or are expected to exceed the PEL, 50 µg/m^3. The Contractor shall submit a negative exposure assessment and obtain COTR approval when the work will be performed without negative pressure inside the work area.

2. The Contractor shall provide HEPA filters that have been individually tested and certified by the manufacturer to have an efficiency of not less than 99.97 percent when challenged with 0.3 µm di-octyl phthalate (DOP) particles when tested in accordance with Military Standard Number 282 and Army Instruction Manual 136-300-175A. Provide filters that bear a UL586 label to indicate ability to perform under specified conditions.

3. The number of air filtration units needed to achieve the required air circulation rate shall be determined by the following formula:

65.1.4. ==========

CALCULATE	**Volume of Work Area (Ft^3)**
MULTIPLY BY	**Number of air changes per hour, minimum of ten- 10 (HUD Recommended)**
MULTIPLY BY	**1/60 (hr/minutes) (0.0167)**
DIVIDE BY	**80% of capacity of the air filtration units fully loaded with all filters ADD one additional unit as backup for machine failure or shutdown**
EQUALS	**minimum number of units required (round up to next whole number)**

==========

4. As necessary to achieve air flow throughout the work area, the Contractor shall locate auxiliary makeup air inlets as far away as possible from the air filtration units, preferably near the ceiling and away from barriers that separate the containment from surrounding areas. Cover inlet with poly sheeting flaps to reseal automatically if the pressure differential system should shut down for any reason. Provide rigid framing around the opening. Spray flap and around opening with spray adhesive so that if flap closes meeting surfaces are both covered with adhesive. Use an adhesive that forms contact bond when dry.

E. Placement of Air Filtration Units:

1. The Contractor shall locate air filtration units to optimize air movement throughout the work area. Position air filtration units opposite the decontamination unit or other make-up air inlets.

2. The backup air filtration unit shall be located on site and be available and ready to run at any time.

3. The Contractor shall establish air movement so that airborne lead dust will be carried away from workers' breathing zones.

4. Dead-air pockets shall be minimized by proper ducting of make-up air, if necessary, and by optimum location of the air filtration units. The Contractor shall use smoke tubes to determine if dead-air pockets are present, and shall take corrective action as outlined above when they are found. Report such corrective actions to the COTR immediately.

5. The Contractor shall locate the air filtration units such that access for changing the pre-filters is from inside the containment. The units shall run continuously during pre-filter changing. A supply of filters shall be kept on site outside of containment. If a unit must be turned off for servicing, a backup unit shall be installed.

6. Mount units to exhaust directly or through disposable ductwork outside the building. Use ductwork and fittings of same diameter or larger than discharge connection on fan unit. Use spiral wire-reinforced flex duct in lengths not greater than 15 meters. If direction of discharge from fan unit is not aligned with duct, use sheet metal elbow to change direction. Use 2 meters of spiral wire reinforced flex duct after each direction change.

7. Units may be vented inside the building, as directed by the COTR, only if outside venting is impractical. Units venting inside a building must be vented through an expansion chamber or diffuser system (self-contained water baffle) to reduce the exhaust air velocity. Exhaust ductwork shall be placed as far away as possible from occupied areas.

F. Use of System During the Work:

1. The Contractor shall start air filtration units before beginning abatement work. After work has begun, run units continuously to maintain a constant pressure differential and air circulation until decontamination of the work area is complete and final clearance results have been accepted by the COTR. Do not turn off units at the end of the work shift or when work temporarily stops unless authorized by COTR.

2. The Contractor shall begin work at a location farthest from the air filtration units and proceed toward them. If an electric power failure occurs, immediately stop all work and do not resume until power is restored and air filtration units are operating again.

3.9 PREPARATION OF EXTERIOR LEAD WORK AREAS WHERE AIRBORNE LEAD CONCENTRATIONS ARE KNOWN OR ARE EXPECTED TO EXCEED THE OSHA ACTION LEVEL

A. Exterior lead work shall not be conducted if wind speeds, or gusts are equal to or greater than 30 km/hr; work must stop, and cleanup shall be completed before precipitation begins.

B. Exterior Lead Work Area Preparation:

1. The Contractor shall erect temporary fencing or yellow or red barrier tape at a minimum of 5 meters from the perimeter of the work area. Fencing and tape shall be a minimum height of 1.5 meters.

2. The Contractor shall post warning signs on the building exterior and along temporary fencing or tape barrier.

3. The Contractor shall clean all furniture, equipment, and supplies in the work area with a HEPA-filtered vacuum or by wet wiping, as directed by the COTR.

4. The Contractor shall clean, by HEPA-filtered vacuum or by wet wiping, and remove all electrical and mechanical items (e.g., lighting fixtures, air conditioners, etc.) and general construction items (e.g., door and window trim, moldings, etc.) which cover the surface of the Work, as directed by the COTR.

   Reinstall all such materials upon completion of the Work with materials, finishes, and workmanship to match conditions existing before the start of work.

5. The Contractor shall remove, to a 5-meter distance from the work area, all removable furniture, equipment, and supplies that have been deemed by the COTR to be uncontaminated, or completely

cover with two layers of 0.15 mm (six-mil) poly sheeting and duct tape. Such furniture, equipment, and supplies shall be considered outside the work area unless the poly seal is breached.

6. The Contractor shall clean all surfaces in the work area with a HEPA-filtered vacuum or by wet wiping, as directed by the COTR.

7. The Contractor shall install a minimum of two layers of 0.15 mm (six-mil) poly sheeting on all critical barriers in the work area to the building interior (e.g., windows, doors, , etc.).

8. The Contractor shall cover the floor surface of the work area with two layers of
0.15 mm (six-mil) poly sheeting turned up at any walls at least 600 mm. Spray glue and duct tape all seams in the floor sheeting; size sheets to minimize number of seams. Locate seams in top layer 2 meters from, or at right angles to, seams in bottom layer. Install poly so that top layer can be removed independently of bottom layer. Do not locate seams at wall/floor interfaces.

9. Do not anchor ladder feet on top of poly; the poly shall be punctured to provide secure anchoring of the footings to the surface underneath. Punctures in the poly shall be resealed with a minimum of two layers of poly sheeting.

10. The Contractor shall cover poly sheeting in areas where scaffolding is to be used with a single layer of 13 mm thick fire-retardant plywood. Wrap edges and corners of each plywood sheet with duct tape.

11. The Contractor shall install an additional layer of poly on the ground as a drop cloth to protect the primary floor layers from debris. The drop cloth shall be rolled and disposed as contaminated waste at the end of each workday and a new drop cloth installed at the beginning of each workday.

12. Where applicable, or as directed by COTR, the Contractor shall protect work area surfaces with 13 mm thick fire-retardant plywood or appropriate substitute to protect against falling debris (e.g., nails, tools, etc.).

13. The Contractor shall install a minimum of two layers of 0.15 mm (six-mil) poly sheeting 5 meters in width around the perimeter of the work area. The sheeting shall be sufficiently weighted at all

edges to prevent migration of the sheeting. The sheeting shall be placed in a manner that traps all debris and water; this is best accomplished by elevating the edges.

14. The Contractor shall install a 4.5 kg ABC type portable fire extinguisher in the clean area adjacent to the decontamination unit.

15. The Contractor shall provide GFCI protection for all electrical equipment; provide temporary lighting in the work area.

C. Construction of Decontamination Unit:

1. The Contractor shall construct a decontamination unit at each location where workers and equipment will enter or exit the work area.

2. The decontamination unit shall be directly adjacent to the work area, and shall consist of an equipment room and wash area in series. The Contractor shall ensure that employees use the decontamination unit prior to leaving the work area.

3. The Contractor shall select and designate a clean area adjacent to the entrance to the wash area for the workers to change into protective equipment. The clean area shall contain clean clothes and towels, and storage area for HEPA vacuums, respirators, and other personal protective equipment.

4. Contaminated equipment or personnel shall not be permitted in the clean area. The Contractor shall ensure that employees do not leave the work area wearing protective clothing. Post OSHA decontamination procedures in the clean area for duration of the Work.

5. Where showers are not provided, the Contractor shall provide adequate washing facilities in the wash area of the decontamination unit.

6. Washing facilities shall contain both cold and hot water, soap, and towels.

7. The Contractor shall filter wastewater using filters having a maximum pore size of 5.0 microns, or dispose of water as lead-

contaminated waste in accordance with these Specifications.

3.10 PREPARATION OF LEAD WORK AREAS WHERE THE AIRBORNE LEAD CONCENTRATIONS ARE BELOW OR EXPECTED TO BE BELOW THE ACTION LEVEL

A. The following procedures define the requirements for the preparation of an interior lead work area where work activities generate or are expected to generate concentrations of airborne lead less than the OSHA Action Level.

1. The Contractor shall clean all furniture, equipment, and supplies in the work area with a HEPA-filtered vacuum or by wet wiping, as directed by the COTR, prior to being moved or covered.

2. The Contractor shall clean, by HEPA-filtered vacuum or by wet wiping, and remove all electrical and mechanical items (e.g., lighting fixtures, , diffusers, registers, etc.) and general construction items (e.g., cabinets, casework, door and window trim, moldings, etc.) which cover the surface of the Work, as directed by the COTR. Reinstall all such materials upon completion of the Work with materials, finishes, and workmanship to match conditions existing before start of the Work.

3. The Contractor shall remove all removable furniture, equipment, and supplies that have been deemed to be uncontaminated by the COTR, or with the approval of the COTR shall completely seal with two layers of 0.15 mm (six-mil) poly sheeting and duct tape. Such furniture, equipment, and supplies shall be considered outside the work area unless covering poly seal is breached.

4. The Contractor shall install an air lock at each doorway entrance to the work area. Air locks shall be constructed using two sheets of 0.15 mm (six-mil) poly sheeting. The first layer shall be sealed at the top, the floor, and each side of the doorway; cut a slit for passage down the middle of the first layer; do not cut the slit all the way to the floor. Tape the second sheet of plastic across the top of the door only, so that it acts as a flap. The flap shall open into the work area. Post lead warning signs at each doorway entry to the work area.

5. The Contractor shall seal all ventilation openings (supply and exhaust), and seams in HVAC system components with two layers of 0.15 mm (six-mil) poly sheeting.

6. The Contractor shall clean all surfaces in the work area with a HEPA-filtered vacuum or by wet wiping, as directed by the COTR.

7. The Contractor shall cover the floor of the work area with two layers of 0.15 mm (six-mil) poly sheeting as a drop cloth.

8. The Contractor shall install a 4.5 kg ABC type portable fire extinguisher at the entrance to the work area.

9. The Contractor shall provide GFCI protection for all electrical equipment.

10. The Contractor shall designate a decontamination area at the entrance to the work area and shall provide washing facilities that include both cold and hot water, soap, and a sufficient quantity of clean towels.

11. The Contractor shall filter waste water using filters having a maximum pore size of 5.0 microns, or dispose of water in accordance with these Specifications.

B. The following procedures define the requirements for the preparation of an exterior lead work area where work activities generate or are expected to generate concentrations of airborne lead less than the OSHA Action Level.

1. . Methods for surface decontamination and/or disposal of unsalvageable objects shall be determined by the COTR.

2. Exterior lead-based paint interim control work shall not be conducted if wind speeds or gusts are equal to or greater than 30 km/hr; work must stop and cleanup shall be completed before precipitation begins; work shall not begin if

precipitation has been forecast to occur during the work shift.

3. The Contractor shall erect temporary fencing, or yellow or red barrier tape, at a minimum of 5 meters from the perimeter of the work area. Fencing and tape should be a minimum height of 1.5 meters.

4. The Contractor shall post warning signs on the building exterior and along the temporary fencing or tape barrier.

5. The Contractor shall clean all furniture, equipment, and supplies in the work area with a HEPA-filtered vacuum or by wet wiping, as directed by the COTR.

6. Remove to a 5-meter distance from the work area all removable furniture, equipment, and supplies that have been deemed by the COTR to be uncontaminated, or with the approval of the COTR completely cover with two layers of 0.15 mm (six-mil) poly sheeting and duct tape. Such furniture, equipment, and supplies shall be considered outside the work area unless the poly seal is breached.

7. The Contractor shall seal all ventilation openings with two layers of 0.15 mm (six-mil) poly sheeting.

8. The Contractor shall clean, by HEPA-filtered vacuum or by wet wiping, and remove all electrical and mechanical items (e.g., lighting fixtures, air conditioners, etc.) and general construction items (e.g., door and window trim, moldings, etc.) which cover the surface of the Work, as directed by the COTR. Reinstall all such materials upon completion of the Work with materials, finishes, and workmanship to match conditions existing before the start of work.

9. The Contractor shall clean all surfaces in the work area with a HEPA-filtered vacuum or by wet wiping, as directed by the COTR.

10. The Contractor shall cover the floor of the work area with two

layers of 0.15 mm (six-mil) poly sheeting. An additional layer of poly sheeting shall be installed as a drop cloth. Extend poly floor layers to a 5-meter distance around the perimeter of the work area. The sheeting shall be sufficiently weighted at all edges to prevent migration of the sheeting. The sheeting shall be placed in a manner that traps all debris and water; this is best accomplished by elevating the edges.

11. The Contractor shall not place ladder footings directly on the top layer of floor poly. Rather, the poly shall be punctured to provide secure anchoring of the footings to the surface underneath. Punctures in the poly shall be resealed with two layers of 0.15 mm (six-mil) poly sheeting.

12. The Contractor shall designate a decontamination area at the entrance to the work area and shall provide washing facilities that include both cold and hot water, soap, and a sufficient quantity of clean towels.

13. The Contractor shall filter waste water using filters having a maximum pore size of 5.0 microns, or dispose of water in accordance with these Specifications.

14. The Contractor shall install a 4.5 kg ABC type portable fire extinguisher at the entrance to the work area.

15. The Contractor shall provide GFCI protection for all electrical equipment.

3.11 PRE-INSPECTION OF LEAD WORK AREAS

A. The Contractor shall perform the following actions for the SI IH and the COTR prior to beginning the work. These actions may be modified for pre-inspection of O&M work areas, per the “Operation and Maintenance Procedures and Controls” of this specification.

1. Show proper sealing of poly layers, including all critical barriers.

2. Demonstrate procedures for how workers will enter and exit the decontamination unit.

3. Demonstrate procedures for handling emergencies and for the prevention of contamination of surrounding areas.

4. With the COTR, identify disabled building ventilation systems and the means that will prevent accidental or premature restarting. Confirm means to have units restarted at the conclusion of the Work. With the COTR, verify that all affected equipment is secured at the main breaker.

5. Demonstrate how lead-contaminated wash water will be filtered and drained or collected for disposal.

6. Demonstrate how lead-containing and lead-contaminated waste will be removed for transport, where the waste will be stored, and how it will be secured during storage; identify procedures for hauling waste through the building to the loading area.

B. The Contractor shall perform the following additional actions for the COTR prior to beginning all work using negative pressure in the work area:

1. Demonstrate that the work area can maintain negative pressure of 0.5 mm of water for a minimum of 2 hours prior to commencement of the Work, unless the system is exhausted through an isolated ventilation system. In this case, the test period shall be long enough to ensure that the lock-out ventilation controls are not over ridden and the HVAC system does not reactivate. At a minimum, the Contractor shall make all arrangements and demonstrate satisfactory equipment operation and set-up for compliance with these Specifications.
2. Show proper condition of equipment seals.
3. Show proper operation of safety and warning devices.
4. Show proper operation and calibration of instrumentation.
5. Show identification of air filtration units and each unit’s capacity.
6. Use smoke tubes to demonstrate that negative air pressure and adequate air circulation is being maintained in the work area and that no dead air pockets are present in the work area. Demonstrate positive air motion through the decontamination unit into the work area.

7. Show the installation method for pre-filters, and the HEPA primary filter in the air filtration unit. Show supply of filters available on site.
8. Use a pressure differential meter or manometer to demonstrate the required pressure differential at every barrier separating the work area from the balance of the building, equipment, ductwork, or outside.
9. Demonstrate that each air filtration unit is serviced by a minimum 115V-20A circuit with GFCI protection.

C. The Contractor shall begin the lead work activities only after the following criteria have been met:

1. Pre-abatement testing has been conducted.

2. The work area has been prepared according to these Specifications.

3. The prepared work area has been inspected and approved by the COTR.

4. Arrangements have been made for managing and disposing of the waste at an acceptable site.

3.12 MAINTENANCE OF LEAD WORK AREAS

A. The Contractor shall ensure that the work area isolation methods are effectively sealed and taped for the duration of the Work.

B. The Contractor shall repair damaged lead work areas and remedy defects immediately upon discovery. Visually inspect each lead work area containment at the beginning, middle, and end of each work shift. Use smoke tubes to test the effectiveness of the containment on a daily basis and when requested by the COTR or SI IH.

C. Damaged or deteriorating materials shall not be used and shall be removed from the premises. Material that becomes exposed to and contaminated with lead shall be decontaminated or disposed of as lead-contaminated waste in accordance with the procedures outlined in these Specifications.

D. The Contractor shall clean debris and residue inside of the

decontamination unit on a daily basis. Clean debris from shower pans on a daily basis.

E. The Contractor shall maintain dry floors in the clean room and airlocks to minimize slips and trips.

F. The Contractor shall maintain emergency and fire exits from the work area, or establish alternative exits satisfactory to the COTR. Maintain appropriate fire extinguishers in all work areas for the duration of the Work.

3.13 PROHIBITED LEAD WORK METHODS

A. Open Flame Burning or Torching, unless appropriate engineering controls as well as PPE are utilized in accordance with 29 CFR 1926.353 and 354 and approved by SI-OSHEM:

1. Burning, torching, fossil fuel-powered heat plates, welding, and cutting torches are prohibited because of the high temperatures generated in the process; at these temperatures, lead fumes may be produced.

2. Using cutting torches to remove fire escapes, railings, or other metal components coated with lead-paint is prohibited unless the lead-paint is removed first, in accordance with these Specifications.

3. Welding of painted metal components (e.g., pre-primed structural steel) is prohibited by OSHA regulations.

B. Heat Guns Operating Above 590 °C (1,100 ºF):

1. Electric heat guns operating at temperatures greater than 590 °C and 1,100º F are prohibited because of the high temperatures generated in the process; at these temperatures, lead fumes may be produced.

C. Machine Sanding or Grinding Without a HEPA Exhaust Tool:

1. Machine sanding or grinding is prohibited (regardless of the grit used) because of the large volume of leaded dust generated.

2. Extensive dry hand sanding is not permitted, but limited dry sanding or scraping near electrical circuits may be permitted when directed by the COTR.

D. Uncontained Hydroblasting or High-Pressure Water Wash:

1. Uncontained hydroblasting and high-pressure water washing are prohibited due to the large quantity of uncontained lead-contaminated waste water generated.

E. Abrasive Blasting or Sandblasting:

1. Traditional abrasive blasting or sandblasting is prohibited due to the large quantity of lead dust produced.

F. Chemical Paint Removal Using Methylene Chloride-Based Paint Strippers:

1. Chemical paint removers containing methylene chloride are prohibited due to the potential health effects caused by the use of methylene chloride.

G. Dry Scraping:

1. Dry scraping is not permitted because of the large volume of leaded particulate matter generated. However, The COTR may authorize the use of dry scraping in limited surface areas around electrical outlets, where appropriate.

2. Dry scraping is permitted when performed in conjunction with heat gun removal as discussed in Section 3.14.5.B of these Specifications.

3.14 ENGINEERING CONTROLS AND WORK PRACTICES FOR SPECIFIC WORK ACTIVITIES IMPACTING LEAD

3.14.1 Interior Selective Demolition and Whole Component Removal Work Activities

A. Contractor shall prepare work areas where demolition and/or whole building component removal work activities are occurring as work areas exceeding the OSHA Action Level unless the Contractor can provide a NEA for the specific work activity demonstrating that the documented engineering controls and work practices are effective in controlling airborne lead concentrations below the OSHA Action Level as specified in these Specifications.

B. Interior Selective Demolition and Whole Component Work Practices

1. Surfaces to be demolished and/or removed shall be misted with water prior to impacting them.

2. Building components shall be demolished and/or removed in a manner as to minimize the generation of dust within the work area.

3. The work area shall be misted with water as necessary to keep airborne dust levels to a minimum.

4. Using a utility knife or other sharp instrument, the Contractor shall carefully score all affected painted seams. This will provide space for a pry instrument to remove the component and will minimize paint chipping and dust generation during removal.

5. The Contractor shall carefully remove loose and flaking paint by wet scraping or wet sanding, as directed by the COTR. HEPA vacuum and wet wipe the surface.

6. The Contractor shall remove any screws or other fasteners. Using a flat pry instrument and a hammer, carefully pry the selected building component away from the surface to which it is attached. The pry bar shall be inserted into the seam at the nail (or other fastening device) at one end of the component and pressure applied to the pry bar. This process shall be repeated at other fastening locations until the end of the component is reached. By prying in this manner, the component will be removed intact and paint chip and dust generation will be minimized. A pry point pad or softener may be required to minimize damage to adjoining substrates.

7. The Contractor shall carefully remove, or bend back, all nails (or

other fastening devices) and place the component in an impermeable waste disposal container, as defined in these Specifications.

8. The Contractor shall deliver the properly sealed component to an off-site paint stripping facility, as directed by the COTR, or dispose of in accordance with these Specifications.

9. Stripped component, or new lead-free component shall not be installed until the work area has been cleaned in accordance with these Specifications, the area has been visually inspected by the SI IH and approved by the COTR, and clearance sampling results have been accepted by the COTR.

10. When lead-free building components are being installed, the lead-free components shall be back caulked prior to installation (back caulk means to apply caulk to underside of the components).

11. Prior to the end of each work shift, the Contractor shall clean the work area floors using wet sweeping/mopping techniques. If a vacuum is to be utilized, it shall be equipped and exhausted through a HEPA filter.

12. Prior to reoccupancy by trade workers or personnel without a minimum of lead awareness training, the work area shall be cleaned and properly cleared for reoccupancy based upon final clearance testing as specified herein.

3.14.2 Interim Controls and Surface Stabilization of Lead-Containing Surfaces for New Finishes

A. Contractor shall prepare work areas where interim controls and surface stabilization work activities are occurring as work areas exceeding the OSHA Action Level unless the Contractor can provide a NEA for the specific work activity demonstrating that the documented engineering controls and work practices are effective in controlling airborne lead concentrations below the OSHA Action Level as specified in these Specifications.

B. Surface Stabilization Work Practices.

1. General Requirements:

   a. All loose surface material should be removed by hand treatments (i.e., wet scraping and wet sanding).

   b. Surface contaminants that prevent adhesion of new finishes should be eliminated by cleaning (i.e., chemical degreasing, trisodium phosphate washing, or other equivalent detergent followed by thorough rinsing).

   c. Surface gloss should be eliminated by chemical etching or wet sanding. All solvents and/or chemicals used on-site are to be pre-approved by the COTR prior to being brought to project site.

   d. Adhesion of new finishes to the substrates may be enhanced by chemical etching, spot sealing, and/or wet sanding.

2. Surfaces shall be misted with water prior to scraping or conduct wet scraping techniques.

3. Wet Scraping:

   a. Wet scraping of lead-containing material shall be conducted to remove loose or flaking paint prior to repainting, encapsulation, or enclosure of the lead-containing material. Wet scraping shall not be employed as an abatement technique over a large surface area without approval from the COTR.

   b. Working one square meter at a time, the Contractor shall lightly mist the surface with amended water using an airless sprayer or hand-held spray bottle. Using a paint scraper, loose lead-containing material shall be scraped from the surface. The Contractor shall use extreme caution not to damage the existing substrate or the integrity of intact lead-containing surface coatings.

c. Scraper blades shall be kept sharp to minimize surface abrasion and gouging of the substrate. The Contractor shall have sufficient additional blades on site; scraper blades shall be selected for the surface being abated.

d. To obtain a smooth finish, the Contractor may need to follow wet scraping activities by wet sanding or HEPA-sanding the surface following procedure outlined in these Specifications, as directed by the COTR.

4. Wet Sanding:

a. Wet sanding shall be employed to remove loose or flaking lead- containing materials prior to repainting, encapsulation, or enclosure of the lead-containing material. Wet sanding shall not be conducted as an abatement technique over a large surface area without approval from the COTR.

b. Working one square meter at a time, the Contractor shall lightly mist the surface with amended water using an airless sprayer or hand-held spray bottle. Loose lead-containing material shall then be sanded from the surface. The Contractor shall exercise extreme caution not to damage the substrate or the integrity of intact lead-containing surface coatings.

c. The Contractor shall maintain a slightly wet substrate surface during all wet sanding.

C. Paint film stabilization involves the priming and repainting of lead-containing surface coatings and typically includes performing corrective work or repairs to the building which caused the existing lead-containing surface coating to fail (e.g., moisture problems, mechanically damaged paint, chemical incompatibility, poor surface preparation, aging paint, etc.). These repairs and defects must be specifically addressed prior to paint stabilization.

D. The Contractor shall perform paint film stabilization as an interim lead-control according to the following general guidelines, and as directed by the COTR:

1. Perform all corrective work or repairs to the building which caused the existing lead-containing surface coating to fail. Repair all rotted structural, siding, or railing components; defective plaster; missing door hardware; loose siding or trim; loose wallpaper; etc., as directed by COTR.

2. Prepare the surface by wet scraping or wet sanding, following the procedures in these Specifications, to remove loose, flaking, and deteriorated paint.

3. HEPA vacuum and wet wipe all work area surfaces to remove the paint chips, debris, and dust generated during the Work.

4. Clean, de-gloss, neutralize, and rinse surfaces. Surfaces must be dry before priming or repainting. HEPA vacuum surface after drying.

5. Select primer and topcoat by considering longevity, moisture resistance, and organic compound content with low volatility. Paint film stabilization involves the application of at least two coats (the primer and the topcoat); use a primer/topcoat system from the same manufacturer to ensure compatibility.

6. Apply all paints at thickness according to manufacturer's directions. Apply paint only during proper temperature, wind, and humidity conditions, according to the manufacturer's directions. Allow sufficient time for each coat to dry fully.

7. The COTR will conduct regular evaluations of the stabilized area and report defects or deterioration to the Contractor for re-stabilization.

E. Friction and Impact Surface Treatment of Lead-Containing Surface Coatings

1. Friction surfaces are those surfaces painted with lead-containing material that are subject to abrasion (e.g., window components, tight-fitting doors, cabinet doors, stairway treads and railings, etc.), resulting in the generation of lead- contaminated dust;

impact surfaces are protruding surfaces that tend to be bumped or banged (e.g., doors and doorjambs, wall corners, chair rails, baseboards, etc.), causing small chips of lead-containing material to dislodge and fall to the floor.

2. For windows, remove stop bead and parting strip and dispose of properly. Wet scrape deteriorated lead-containing material in accordance with these Specifications. If the window trough is badly weathered, cap with back-caulked, aluminum coil stock. If necessary, repair the window weight and pulley system, as directed by the COTR. Install new window channel or slide system and replace stop bead (and parting strip if required).

3. For doors, remove the doorstop and dispose of properly. Remove door by pulling out hinge pins. Mist and plane door to eliminate friction points. Reinstall door and install new doorstop.

4. For baseboards, remove and dispose of shoe molding and replace, as directed by the COTR.

5. For abraded outside wall corners, install new plastic or wood corner protector, as directed by the COTR.

6. Perform the removal of lead-contaminated dust, as directed by the COTR, in accordance with these Specifications.

7. Prior to reoccupancy by trade workers or personnel without a minimum of lead awareness training, the work area shall be cleaned and properly cleared for reoccupancy based upon final clearance testing as specified herein.

3.14.3 Stripping of Lead-Containing Surface Coatings with a Chemical Solvent

A. Contractor shall prepare work areas where stripping LCM using chemical solvents is occurring as work areas exceeding the OSHA Action Level unless the Contractor can provide a NEA for the specific work activity demonstrating that the documented engineering controls and work practices are effective in controlling airborne lead concentrations below the OSHA Action Level as specified in these Specifications.

B. Chemical stripping agents shall contain no methylene chloride products. Chemical stripping agents shall be compatible with, and not harmful to the substrate to which they are applied. The Contractor shall comply with the manufacturer's recommendations for use of the stripping agent.

C. The Contractor shall carefully consult the MSDS for the stripping agent selected to determine potential chemical hazards and appropriate personal protective equipment. The Contractor shall provide sufficient quantities of personal protective equipment, as required by OSHA and in accordance with the manufacturer's Specifications, when performing chemical stripping. The following personal protective equipment shall be supplied, at a minimum:

1. chemically resistant clothing
2. long neoprene, rubber, or PVC gloves
3. face shields
4. eyewash station with an abundant source of water
5. an abundant source of running water to flush chemicals from the skin
6. proper secondary chemical respiratory filters, in addition to those for lead dust

D. The Contractor shall apply the chemical stripping agent to the building component surface to be abated. The stripping agent shall be applied with a spatula, trowel, brush, or spray gun, in accordance with the manufacturer's Specifications. Spray gun use is permitted only with prior approval of the COTR. The Contractor shall exercise extreme caution when applying the stripping agent to overhead surfaces to avoid dripping onto workers below.

E. The Contractor shall allow the stripping agent to remain on the lead-containing surface coating for the manufacturer's recommended time period. The stripping agent shall not be allowed to dry out, and shall be covered with a poly or paper blanket that is pressed to the surface to prevent drying.

F. The Contractor shall manually remove the treated paint from the substrate using a scraper or a putty knife. The Contractor shall exercise extreme care not to damage the substrate.

G. Scraper blades shall be kept sharp to minimize surface abrasion and gouging of the substrate. The Contractor shall have sufficient additional blades on site; scraper blades shall be selected for the surface being abated.

H. The Contractor shall thoroughly scrub the surface with a solution of glacial acetic acid to neutralize the abated substrate and remove residual residue (wood surfaces shall not be permitted to dry). The use of vinegar as a neutralization agent is prohibited. The Contractor shall carefully consult the MSDS for the neutralization agent and shall provide personal protective equipment accordingly to the abatement workers.

I. Following neutralization, the damp surface shall be thoroughly scrubbed with a high- phosphate detergent or other acceptable cleaner. Scrubbing should continue until no visible residues remain. The cleaning solution must be changed regularly.

J. The Contractor shall scrub the surface with clean water to remove residue. The pH of the water wash shall be checked after use. If the pH of the water wash exceeds 8.0, further neutralization of the surface with the acetic acid solution is necessary; an alkaline surface (pH of 8.0 or greater) may not be compatible with new paint.

K. For wood surfaces, if the moisture has raised the grain and sanding of the wood surface is required before repainting, a HEPA-equipped sander shall be used in accordance with these Specifications.

L. Prior to reoccupancy by trade workers or personnel without a minimum of lead awareness training, the work area shall be cleaned and properly cleared for reoccupancy based upon final clearance testing as specified herein.

3.14.4 Installation of Enclosure Systems for Lead-Containing Surfacing Coatings – Not Used.

3.14.5 Mechanical Methods of Lead-Containing Surface Coatings Removal

A. Contractor shall prepare work areas where LBP and/or LCM are removed as work areas exceeding the OSHA Action Level unless the Contractor can provide a NEA for the specific work activity demonstrating that the

documented engineering controls and work practices are effective in controlling airborne lead concentrations below the OSHA Action Level as specified in these Specifications.

B. Heat Guns:

1. The Contractor shall use heat guns operating below 590 °C (1100° F) only; the use of heat guns operating at temperatures greater than 590 °C (1100° F) is prohibited.

2. Heat gun removal may only be conducted in negative pressure containments, constructed in accordance with these Specifications.

3. The Contractor shall exercise extreme caution when performing heat gun removal around wallpaper, insulation, and other flammable materials.

4. The Contractor shall maintain a fully charged ABC-type 9 kg fire extinguisher in the work area, as required by OSHA regulations.

5. The Contractor shall allow the heat stream leaving the gun to merely soften the paint. Do not allow the paint film to scorch or smoke. At the first sign of paint softening, blistering, or bubbling, remove the heat stream and manually scrape the softened paint from the substrate. Heat gun removal shall begin at the highest point on the surface and proceed to the lowest point.

6. The Contractor shall maintain sharp scraper blades to minimize surface abrasion and gouging of the substrate. The Contractor shall have sufficient additional blades on site; scraper blades shall be selected for the surface being abated.

7. To obtain a smooth finish, the Contractor may need to follow heat gun activities by wet sanding or HEPA-sanding the surface following procedures outlined in these Specifications, as directed by the COTR.

C. HEPA Vacuum Needle Gun:

1. HEPA-equipped needle guns are permitted for abatement of lead-containing material from metal substrates only and may damage other surfaces.

2. The Contractor shall select the proper shroud as recommended by the manufacturer to match the configuration of the substrate being abated.

3. The Contractor shall operate the HEPA-vacuum attachment at all times for the duration of the lead-containing material abatement.

D. HEPA Vacuum Blasting:

1. The Contractor shall conduct blasting on flat, exterior surfaces or on surfaces compatible with available blast heads as recommended by the equipment manufacturer.

2. The Contractor shall maintain blast head in contact with the lead-containing surface to provide maximum collection of dust and debris created by the blasting operation.

E. Machine HEPA Sanding:

1. Machine sanding without a HEPA-filtered vacuum attachment is prohibited. When using a sander equipped with a HEPA-filtered vacuum, the Contractor shall strictly follow the manufacturer's operating instructions and instructions for care and maintenance.

2. During HEPA sanding, the Contractor shall maintain the operation of the HEPA- vacuum attachment during all sanding operations. The sanding surface shall be held flat to the paint surface. Sanding operations shall be conducted on flat surfaces only.

3. The Contractor shall not allow the sanding pad surface to extend beyond the surface being sanded. The potential for the production of airborne lead dust increases when the sanding disk is wider than the surface being abated.

4. HEPA sanding is not permitted on detailed moldings.

F. Prior to reoccupancy by trade workers or personnel without a minimum of lead awareness training, the work area shall be cleaned and properly cleared for reoccupancy based upon final clearance testing as specified herein.

3.14.6 Lead-Contaminated Soil Removal

A. Contractor shall prepare work areas where lead-contaminated soil is removed as work areas exceeding the OSHA Action Level unless the Contractor can provide a NEA for the specific work activity demonstrating that the documented engineering controls and work practices are effective in controlling airborne lead concentrations below the OSHA Action Level as specified in these Specifications.

B. The Contractor shall tie and protect existing trees, shrubs, and bushes in the work area.

C. The Contractor shall use hand-held spray equipment to dampen soil. Do not over saturate and cause water to run onto adjacent areas.

D. The Contractor shall remove existing lead-contaminated soil using shovels or HEPA- vacuum loading equipment starting at the point farthest from the decontamination unit. Remove a minimum depth of 150 mm of lead-contaminated soil, or as directed by the COTR.

E. Do not track through areas where soil has been removed.

F. At the end of each shift, or during periods of excessive winds, cover lead-contaminated sections of soil with one layer of 0.15 mm (six-mil) poly sheeting; anchor sufficiently to prevent the migration of the poly.

G. Replace the removed soil at proper grade to allow drainage. Replacement soil shall be at least 50 mm above existing grade to allow for settling. Soil must contain less than 400 ppm of lead.

H. Install new soil covering (e.g., grass or sod). The Contractor shall consult with the Smithsonian Institution Office of Horticulture Services when selecting an appropriate grass or sod covering.

3.14.7 Encapsulation of Lead-Containing Surface Coatings

A. Contractor shall prepare work areas where lead-containing materials are to be encapsulated as work areas exceeding the OSHA Action Level unless the Contractor can provide a NEA for the specific work activity demonstrating that the documented engineering controls and work practices are effective in controlling airborne lead concentrations below the OSHA Action Level as specified in these Specifications.

B. Encapsulation:

1. Surfaces of non-deteriorated substrates covered with intact lead-containing material may be considered for encapsulation.

2. Conduct field tests of surfaces to be encapsulated for paint film integrity. Test the adhesion by performing a minimum 150 mm x 150 mm test patch. The area must be visually clean of dust and debris before performing the test patch. Conduct a minimum of one test patch on each type of lead-containing material covered building component to which the encapsulant will be applied.

3. The following surfaces and components are typically not suitable for encapsulation. Alternate interim control or abatement methods shall be considered for the following:

a. Friction surfaces, such as window jambs and door jambs. Friction surfaces are typically subject to repeated damage, thereby compromising the integrity of the encapsulant applied.

b. Surfaces with substrates or existing coatings that have a high level of deterioration. Encapsulants on these surfaces have a high rate of failure as a result of the surface or substrate deterioration.

c. Surfaces in which there is a known incompatibility between two existing surface coating layers. This incompatibility typically cannot be determined without performing a test patch of the surface.

d. Surfaces that cannot support the additional weight stress of encapsulation due to existing paint thickness. This inability to support the additional weight of an encapsulant

typically cannot be determined without performing a test patch of the surface.

e. Metal surfaces that are prone to rust or corrosion. Encapsulants on metal surfaces typically fail when the surface underneath rusts.

4. Repair all building components and substrates as needed (e.g., caulk cracks and repair sources of water leaks).

5. Prepare surfaces. Remove all dirt, grease, chalking paint, mildew and other surface contaminants, remnants of cleaning solutions, and loose paint. All surfaces shall be de-glossed, as needed.

6. Apply one of the three following types of encapsulant, as approved by OSHEM and directed by the COTR.

a. Non-reinforced liquid coatings

1. Apply using a brush, roller or spray. Non-reinforced liquid coatings are suitable for many interior and exterior substrates. Application procedures and requirements vary with specific type selected; follow manufacturer's directions during application.

b. Reinforced liquid coatings:

1. Apply using a brush, roller, spray, or trowel. Application procedures for reinforced liquid encapsulants vary with specific type selected, and may require the application of a fabric; follow manufacturer’s directions during application.

NOTE: Use of liquid coatings is prohibited in the State of Maryland for residential, child-occupied, commercial and steel structures. Approval for use in other jurisdictions will be on a case-by-case basis.

c. Adhered materials (e.g., vinyl wall coverings, vinyl floor tile,

etc.):

1. Contractor shall apply adhesive first, then install the selected encapsulant product. The Contractor shall carefully follow the manufacturer's directions for application of adhesive product and encapsulant selected.

7. During encapsulant application or installation, monitor air temperature and relative humidity and perform the encapsulant application according to the manufacturer's guidelines for these parameters. For liquid coatings, monitor the coating thickness to ensure that the encapsulant manufacturer's Specifications are met.

8. For liquid coating encapsulants, allow coating to cure and then visually examine it for wrinkling, blistering, cracking, bubbling, or other chemical reaction with the underlying paint. For all encapsulants, perform the appropriate adhesion tests recommended by the manufacturer.

9. The COTR will conduct regular evaluations of the encapsulated area and report defects or deterioration to the Contractor for re-stabilization.

C. Prior to reoccupancy by trade workers or personnel without a minimum of lead awareness training, the work area shall be cleaned and properly cleared for reoccupancy based upon final clearance testing as specified herein.

3.14.8 Cleaning of Lead-Contaminated Surface Dust

A. Contractor shall prepare work areas where lead-contaminated surface dust cleaning work activities are performed as work areas exceeding the OSHA Action Level unless the Contractor can provide a NEA for the specific work activity demonstrating that the documented engineering controls and work practices are effective in controlling airborne lead concentrations below the OSHA Action Level as specified in these Specifications.

B. Dust Removal and Control:

1. The removal and control of lead-contaminated dust shall be performed for those building surfaces with lead dust levels above those in the following table, and as directed by the COTR.

Surface	Leaded Dust Loading (μg/ft²)
Bare and Carpeted Floors	40
Interior Window Sills	250
Window Troughs	400
Exterior Horizontal Surfaces	400

2. Correct any known or suspected lead-containing surface coating hazards which may be contributing to the production of lead-contaminated dust before dust removal, as directed by the COTR.

3. Visually inspect other dust traps (e.g., radiators, floor grates, etc.). If visible dust is observed, the item shall also be cleaned.

4. Clean all horizontal surfaces by HEPA vacuuming and by wet wiping techniques, as directed by the COTR.

5. Begin dust removal at the highest horizontal surface and work down. Clean windows, other dust traps, and finally the floors.

6. During wet cleaning, replace rags, sponges, and mops frequently. Change the wash water often.

7. To discard lead-contaminated carpets or other upholstered furnishings, as directed by the COTR, mist the surface with water; seal the item in plastic sheeting, bags, or containers; and discard properly.

8. To clean lead-contaminated carpets or other upholstered furnishings, HEPA vacuum each surface a minimum five times,

vacuuming the bottom of the item a minimum of three times. Also HEPA vacuum the existing floor below lead- contaminated carpeting a minimum of three times.

3.14.9 Interim Control of Lead-Contaminated Soil

A. Contractor shall prepare work areas where lead-contaminated soil cleaning work activities are performed as work areas exceeding the OSHA Action Level unless the Contractor can provide a NEA for the specific work activity demonstrating that the documented engineering controls and work practices are effective in controlling airborne lead concentrations below the OSHA Action Level as required in these Specifications.

B. Soil Interim Controls:

1. The interim control of lead-contaminated soil shall be performed for those surfaces with lead-in-soil levels below the levels in the following table, and as directed by the COTR. Interim controls are not appropriate, and abatement should be considered for lead-contaminated soil with lead concentrations above the levels in the following table.

Soil Area	Lead in Soil Level (µg/g)
SI Child Care Play Areas	400
Other Soil Areas	1,200

2. Interim control measures for lead-contaminated soil include installing surface coverings (e.g., grass, gravel, etc.) or implementing land use controls in the area (e.g., fencing the area, creating alternative walkways, etc.).

3. The Contractor shall perform the interim control of lead-contaminated soil according to the following general guidelines, and as directed by COTR (the interim control of lead-contaminated soil in a selected area may involve the selection of

one or a combination of a number of controls, to be coordinated with COTR):

a. If the area to be controlled is heavily traveled, grass surface coverings may not be appropriate and more durable coverings such as gravel or pavement should be considered. Consult with the COTR.

b. When seeding or installing sod on a selected area, the Contractor shall consult with the Smithsonian Institution Office of Horticulture Services to determine what grasses are appropriate for the locale, soil type, and sun/shade characteristics. Properly prepare the soil prior to seeding or sodding.

c. When covering lead-contaminated soil with bark or gravel, apply the covering at least 150 to 300 mm deep. New bark, gravel, or other materials shall not contain more than 200 µg/g of lead. The Contractor shall test these materials for lead content prior to installation, unless previous testing data are available and provided to the COTR.

d. Implementing land use controls to reduce exposure to the lead- contaminated soil include installing fencing, warning signs, and thorny bushes. The Contractor shall obtain COTR permission prior to implementing any land use control.

e. Control water erosion by proper grading and installation of drainage channels, as directed by the COTR.

f. Provide walk-off doormats at all adjacent building entryways to reduce the tracking of lead-contaminated soil into the building.

3.14.10 Work Activities Impacting Lead Not Addressed

A. Any work activities impacting lead that have not been addressed by these Specifications must be conducted in accordance with all applicable EPA,

OSHA, and local regulations. In addition, the engineering controls and work practices for all work activities impacting lead or assumed to impact lead must be submitted in writing to the COTR for pre- approval prior to mobilization.

3.15 OPERATIONS AND MAINTENANCE PROCEDURES AND CONTROLS

A. Preparation of work area for O&M during lead-containing material penetration and cutting:

1. Move furnishings and equipment away from the work area. Objects which are fixed-in-place shall be covered with 2 layers of six-mil poly drop cloth.

2. Place 2 layers of six-mil poly drop cloth on the floor and extend cloth at least five feet (1,500mm) from all areas of lead-containing material work.

3. If wall is within 1,500mm of work area perimeter, turn drop cloth up a minimum of 300 mm from the base of the wall and seal to the wall with tape.

4. If liquid runoff is to be generated, roll up edges of drop cloth to create a berm which will contain the liquid waste and debris.

5. Limit access through the work area by demarcating entrance areas to help control traffic with OSHA approved lead caution tape.

B. Work procedures for penetrating or cutting lead-containing material covered surfaces:

1. As a minimum, disposable gloves and shoe coverings are to be worn by individuals performing O&M work to prevent the spread of lead paint dust to other areas. Eye protection, head protection (for overhead work), and full-body protection is recommended.

2. Power tools used for O&M work shall be equipped with a HEPA-filtered, shrouded exhaust. As an alternative, power tools may be

used in conjunction with HEPA-filtered vacuum cleaners held in close proximity to source of dust, provided that, in the judgment of the COTR, this method is shown to result in acceptable dust suppression.

3. Initially mist the work surface area with a water and surfactant solution.

4. Use utility knife or scraper to remove any loose paint from the work surface or to slice the painted edges of the component to be removed from the work surface. Reference wet scraping procedures per this specification to remove paint along the cutting line prior to undercutting doors.

5. Perform the required work on the surface while the surface is wet. Re-wet the surface as needed during penetrating and cutting work.

6. Disconnect power tools during wetting procedures to avoid electrical shock.

7. Ensure that during penetrating and cutting work that lead dust and debris remains on the drop cloth. If dust and debris spreads to other areas, use procedures in the specification for full-scale work area preparation, worker protection and work area cleaning.

8. After completing work, disconnect power tools and re-mist the work surfaces.

9. Clean and rinse all equipment and work surfaces using a wet wash system as covered in the Specifications.

10. Remove shoe covering when stepping off the poly drop cloth.

11. The Smithsonian Institution may conduct a visual inspection and lead clearance testing in compliance with the Specifications. The Contractor shall consult with the COTR regarding final visual inspection and clearance testing prior to start of work activities.

12. After completion of clearance testing, or notification from the COTR, drop cloths shall be rolled inward and placed in disposal

bags with other waste. Waste generated during O&M work may be regulated as a hazardous waste under RCRA per this specification. The SI IH shall collect a representative sample of the generated waste for TCLP analysis.

3.16 LEAD WORK AREA CLEANING PROCEDURES

A. Daily Cleaning:

1. The Contractor shall carefully fold the drop cloth to center and dispose of the poly drop cloth as lead-contaminated waste.

2. The Contractor shall provide general clean-up of lead work area concurrent with the removal of all lead-containing or lead-contaminated materials. Do not permit accumulation of debris on the work area floor.

3. The Contractor shall perform a thorough HEPA vacuuming of the work area. In addition, the Contractor shall utilize an effective cleaning solution during the cleaning activities. Do not perform dry dusting or dry sweeping.

4. The Contractor shall reinstall a clean poly drop cloth before resuming the Work.

B. Final Cleaning at the Completion of Work:

1. The Contractor shall remove all visible accumulations of lead-containing material and debris.

2. The Contractor shall HEPA vacuum all surfaces in the work area, then wet clean the surfaces with an effective cleaning solution; HEPA vacuum all surfaces in the work area again.

3. The Contractor shall thoroughly decontaminate and remove all equipment from the work area.

4. If applicable, the Contractor shall replace all HEPA filters and pre-

filters in air filtration units exhibiting diminished flow capacity with clean filters. Clean all air filtration units.

5. The Contractor shall perform no activity in the work area for a minimum of one hour to allow settlement of airborne particulate. No reduction in this settling time will be permitted.

6. The Contractor shall notify the SI IH for observation of cleaning to determine completeness. Poly surfaces will be considered clean when free from visible dust, dirt, residue, film, or discoloration resultant from the Work.

7. Following successful visual inspection as outlined in these Specifications, the Contractor shall dismantle and carefully remove remaining poly sheeting except for critical barriers.

8. The Contractor shall HEPA vacuum all surfaces in the work area, and then wet clean the surfaces with an effective cleaning solution. Allow surfaces to dry, and HEPA vacuum all surfaces in the work area again.

9. If applicable, the Contractor shall replace all HEPA filters and pre-filters in air filtration units with clean filters. Clean all air filtration units again. Notify the SI IH for observation of cleaning to determine completeness. Work area will be considered clean when free from visible dust, dirt, residue, film, or discoloration resultant from the Work.

10. Following successful visual inspection as outlined in these Specifications, the SI IH will perform appropriate clearance sampling in the work area.

3.17 LEAD WORK AREA CLEARANCE PROCEDURES

A. Visual Inspection:

1. All surfaces within the lead work area will be visually examined by the SI IH. The SI IH will examine the bare surfaces to ensure that there is no visible residue. If residue remains, the Contractor shall re-clean the component prior to repeating the visual

inspection.

2. If a building component has been removed and replaced, the SI IH will examine the work area to ensure that each building component specified for removal and replacement has been completely removed.

3. If a lead-containing surface coating- enclosure system has been installed, the SI IH will examine the mechanical fastening system used to hold the enclosure to the substrate to determine that the fastening system is adequate. All seams and edges in the enclosure will be examined to ensure that they are sealed to provide a dust tight system.

4. If lead-contaminated soil abatement has been performed, the SI IH will examine the work area to ensure that no visible paint chips are present in the soil following the Work. The SI IH will examine all soil areas selected for abatement to document that each has been completely treated, or removed, as specified.

5. If an interim control method has been performed, the SI IH will examine the work area to ensure that the lead hazard control method performed (e.g., encapsulation, paint film stabilization, friction and impact surface treatment, etc.) has been completed.

6. There shall be no evidence of settled dust following the Contractor's cleanup effort regardless of activity. Any settled dust present in the lead work area during the visual inspection provides sufficient evidence that the Contractor's cleanup effort was not adequate. The areas immediately outside the lead work area will also be visually examined to confirm that no leaded dust or paint chips have been transferred outside the work area.

B. Lead Wipe Sampling:

1. For interior work, the SI IH will follow the following guidelines: a minimum of one wipe sample will be collected for every 200 square meters of floor surface area inside the work area; and a minimum of one sample will be collected from each window inside the work area, alternating between interior window sill and

window trough samples (actual number and specific locations of samples will be determined by the SI IH). In addition, one wipe sample will be collected outside the work area within a 3-meter radius of the entrance to the decontamination unit.

2. For exterior work, the SI IH will follow the following guidelines: a minimum of one wipe sample will be collected for every 200 square meters of horizontal surface area (e.g., a porch floor or an entryway) inside the work area, and one wipe sample will be collected from approximately every other window trough inside the work area (actual number and specific locations of samples shall be determined by the SI IH). In addition, one wipe sample will be collected outside the work area within a 3-meter radius of the entrance to the decontamination unit.

3. Cleaning shall be considered complete when every lead dust wipe sample is below the following levels (given in micrograms of lead per square foot):

Surface	Leaded Dust Loading (μg/ft²)
Bare and Carpeted Floors	40
Interior Window Sills	250
Window Troughs	400
Exterior Horizontal Surfaces	400

4. The Contractor shall re-clean those areas which do not comply with the specified final clearance levels. Following re-cleaning efforts, visual inspection and clearance sampling shall be performed to ensure that the re-cleaning was effective. The Contractor is responsible for the cost incurred during re-cleaning activities.

C. Lead Soil Sampling:

1. Following an exterior lead-containing material abatement or interim control, the SI IH will collect a minimum of one composite

soil sample from the perimeter of the area adjacent to the exterior work area. If only selected areas of the building were abated, the composite sample will be collected from that area only. One additional composite soil sample will be collected from each adjacent area, and one will be collected from each adjacent Smithsonian Institution child care play area. During sampling, bare soil shall be collected from the sampling area. If no bare soil is present, the soil covering (e.g., grass, mulch, etc.) shall be sampled to determine if it has been contaminated by the work.

2. Abatement shall be considered complete when each composite lead soil sample is at or below the following levels (given in micrograms of lead per gram of soil):

Soil Area	Lead in Soil Level (µg/g)
SI Child Care Play Areas	400
Other Soil Areas	1,200

3. If lead in soil levels are greater than or equal to the applicable limits, additional soil treatment may be required. Additional soil treatment shall be performed according to the procedures outlined in these Specifications, and as directed by the COTR. The Contractor is responsible for the cost incurred during additional soil treatment activities.

3.18 REMOVAL OF ENGINEERING CONTROLS

A. Following successful final clearance testing and acceptance of results by COTR, the Contractor shall leave air filtration units running until critical barrier removal has been completed.

B. Equipment, machinery, scaffolding, tools, etc., within the work area shall not be removed without first being thoroughly cleaned by HEPA vacuuming and wet wiping with cleaning solution.

C. If applicable, before removing air filtration units from the work area, the Contractor shall remove and properly dispose of pre-filters, decontaminate the exterior of each air filtration unit, and seal the intake to each unit with 0.15 mm (six-mil) poly sheeting. Wrap entire unit with one

additional layer of 0.15 mm (six-mil) poly sheeting.

D. After clearance results have been accepted by the COTR, the critical barrier poly seals have been removed, and the poly sheeting, tape, and any other trash and debris have been disposed of properly, the SI IH and the COTR will conduct a final walkthrough of the work area.

E. The Contractor shall repair, patch and paint all damaged areas and restore them to their original, pre-contract condition.

F. Subsequent to the lead work activities, the Contractor shall perform the following before the Work may be considered for completeness:

1. The work area has been cleaned in accordance with the procedures outlined in these Specifications.

2. Visual clearance examinations and testing have been performed and the results have been accepted by the COTR.

3. Engineering controls have been removed from the work area, and the waste generated during the Work has been removed from the site and disposed of in accordance with these Specifications.

3.19 WASTE MANAGEMENT

A. General:

1. The Contractor shall properly store and secure all waste at all times. Do not leave debris in the work area or in uncovered or unlocked trucks or dumpsters. Do not leave any waste in unsecured areas accessible to the public. Do not incinerate debris or use any unauthorized dumpster. Do not introduce lead-contaminated water into storm or sanitary sewers. Do not permit recycling of building components coated with lead-containing material.

2. All materials, whether hazardous or non-hazardous, shall be disposed of in accordance with all applicable federal, state, and local regulations. Keep all chemicals and chemical waste in sealed

and properly labeled containers. The contractor shall not discard chemicals in trash or down drain. Do not evaporate surplus waste solvents.

3. The Contractor shall maintain on site the name of and contact information for the building's designated Smithsonian Institution Hazardous Waste Coordinator (HWC).

4. The Contractor shall ensure that there is no leakage of waste or release of dust during the storage and transportation of waste.

5. The Contractor shall make every attempt to minimize the total quantities of waste generated by conducting abatement and interim control efforts that generate reduced quantities of both hazardous and non-hazardous waste for disposal, avoiding commingling of hazardous and non-hazardous waste. Painted metal components should be recycled whenever possible, with required corresponding documentation provided to SI.

B. Hazardous Waste Management:

1. The Contractor shall segregate abatement waste into distinct waste streams (e.g., disposable suits, lead-contaminated polyethylene sheeting, lead-contaminated waste water, hazardous chemical sludge, etc.). Various combinations of each in different containers will not be accepted.

2. Lead-containing or lead-contaminated waste shall be considered as hazardous waste, and labeled in accordance with this specification, unless:

a. Lead leachate concentrations of the waste are determined to be less than 5 ppm from representative bulk samples, by TCLP analysis, following the protocol indicated in EPA regulations.

b. The waste does not meet any other regulatory definitions as "hazardous waste" per section 1.4 (A) (29) of these Specifications.

3. Waste tested which results in a lead leachate concentration of greater than or equal to 5 parts per million shall be considered hazardous, and shall be handled and disposed of as such according to local, state, and federal regulations.

4. All TCLP test results shall be permanently retained by the Smithsonian Institution.

5. Lead waste from lead abatement projects completed in residential or child- occupied facilities must be removed from the site within 48 hours after completing cleanup. All other hazardous waste must be removed from the site of a lead abatement project within 90 days of completion of the project.

6. The Contractor shall not discard chemicals in trash or down drains. Do not evaporate surplus waste solvents. Keep chemical waste in appropriate, sealed containers.

C. Containers:

1. The Contractor shall comply with EPA, DOT, and all other applicable federal, state, and local regulations for hazardous waste containers. All hazardous waste containers shall be completely sealed and shall be checked for tightness prior to removal from the work area.

2. All non-hazardous lead waste may be contained in one of the following:

a. Sealed disposal drums:

1) Contractor shall provide sufficient extra caps, rings, gaskets, etc., in the event of drum leakage. Replacement of caps, rings, gaskets, etc. shall not occur without the permission of the COTR.

2) All disposal drums shall be new; no used or damaged disposal drums are acceptable (the Contractor shall provide sufficient dollies or other suitable means of transporting the drums as approved by the COTR).

3) Each filled, sealed drum shall be tipped by the Contractor in the presence of the SI IH prior to removal from the work area.

b. Two layers of 0.15 mm (six-mil) thick poly sheeting, sealed with adhesive spray and duct tape

c. Two layers of 0.15 mm (six-mil) thick poly disposal bags; each bag shall be sealed by 'goose-necking' the bag with duct tape.

D. Storage Requirements:

1. The Contractor shall notify the COTR, who will then notify the HWC when hazardous waste containers start being filled.

2. The Contractor shall keep all waste materials, both hazardous and non-hazardous, inside the work area during the Work.

3. Contractor shall coordinate with the COTR, if necessary, a designated storage area in the building where waste, both hazardous and non-hazardous, may be stored following removal from work area and prior to removal from site. The designated storage area shall be a secured area or lockable container that is inaccessible to all persons other than the Contractor and the COTR.

E. Labeling Requirements:

1. The Contractor shall label each hazardous waste container with the words "HAZARDOUS WASTE LEAD, EPA ID# D008.

2. The Contractor shall mark each hazardous waste container on the

exterior with the accumulation start date. The accumulation start date is that date when a bulk waste disposal container starts to be filled, or when a chemical that will be disposed of is no longer needed.

F. Waste Control Logs:

1. The Contractor shall keep a Waste Control Log (SF-3) of all hazardous waste containers. The SI IH will review the log for accuracy and completeness. The waste hauler shall include a completed copy of SF-3 when submitting the Hazardous Material Profile Sheets. Profile sheets will not be accepted without a copy of the completed log. Profile sheets shall be sent directly to the COTR.

2. All major constituents and hazardous components of the waste shall be identified by chemical name, not by acronym or trade name.

G. Transportation and Disposal:

1. The Contractor shall transport lead waste containers out of the work area either through the decontamination unit or through a separate waste load-out unit, in accordance with these Specifications.

2. Waste load-out shall be done by two teams. The team inside the work area shall clean the outside of properly labeled lead waste containers using HEPA-filtered vacuums and wet wiping, and place them into the decontamination unit. No personnel from the inside team shall exit any further from the work area. The team outside the work area (wearing appropriate protective equipment) shall retrieve the waste containers from the decontamination unit, double-bag the bagged waste, and pass the waste containers to the uncontaminated area outside the decontamination unit. No personnel from the “outside team” shall enter the work area.

3. The Contractor shall perform the removal of hazardous material from public buildings after the building has closed, during non-public hours, and when limited staff is in attendance; arrange with the COTR specific schedule for the removal of hazardous waste.

The Smithsonian Institution reserves the right to restrict when containerized waste will be moved outside of the work area and pass through the building.

4. The Contractor shall coordinate with the COTR within 45 days after the accumulation start date for removal from the site and disposal.

5. Prior to removal from the site, each hazardous waste container shall be weighed and its exact weight recorded on the waste manifest. Waste manifests that include estimated weights will not be accepted. Note: Estimated weights on the Hazardous Material Profile Sheets are acceptable.

6. The Contractor shall provide one copy of the completed Hazardous Waste Manifest to the COTR no less than five days prior to the scheduled date of removal from the site; COTR will review the completed manifest for accuracy and completeness.

7. All hazardous waste shall be hauled by a licensed hazardous waste hauler with all required licenses from all state and local authorities with jurisdiction. The licensed hazardous waste hauler shall provide evidence of previous experience transporting lead-contaminated waste. The licensed hazardous waste hauler shall provide permanent labeling for all containers as required by all federal, state, and local regulations.

8. Hazardous and non-hazardous waste shall be disposed according to all federal, state and local regulations.

3.20 JOB CLOSE-OUT

A. The Contractor shall remove from the site all remaining debris and rubbish resulting from removal and disposal operations and the construction of containments and decontamination units.

B. The Contractor shall demonstrate to the COTR that any building utilities that were temporarily disabled are now in full service. Notify the COTR when disabled building ventilation systems, electrical power, smoke detectors, and building access/egress passages may safely be re-started or used.

C. The Contractor shall replace those items that were removed from the work area prior to or during the Work.

D. The Work will not be considered complete until all submittals required by these specifications have been provided to and approved by the COTR.

3.21 POST ABATEMENT NOTIFICATIONS - The SI will notify the appropriate jurisdiction having authority of abatement actions completed in SI-owned housing.

WASTE CONTROL LOG						
Project Location: **OEDC Project:**				**Contractor Name:**		
Container Number	**Container Type**	**Fill Start Date**	**Date Sealed**	**Contractor Superintendent Initials**	**SI IH Initials**	**Container Contents**

65.1.5. CERTIFICATION OF VISUAL INSPECTION AND FINAL CLEARANCE SAMPLING FOR LEAD WORK

The COTR, Contractor, and SI Industrial Hygienist hereby document that the work areas have been visually inspected and there is no visible dust, debris, or residue present in the areas. The COTR also certifies that final sampling results meet clearance Specifications.

OEDC Project No_____Smithsonian Institution Contract No _____

Project Title/Location_____

_____

Description of the Work _____

Date of Inspection _____

Date and results of final lead wipe samples_____

LEAD ABATEMENT CONTRACTOR
Firm_____
Print Name_____
Print Title _____
Signature _____

SI INDUSTRIAL HYGENIST
Firm_____
Print Name_____
Print Title _____
Signature _____

SI COTR
Print Name_____
Print Title _____
Signature _____

65.1.6. **END OF SECTION 028300**

SECTION 061000 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Framing with dimension lumber.
2. Wood blocking, cants, and nailers.
3. Wood furring and grounds.
4. Wood sleepers.
5. Plywood backing panels.

B. The intent is for patching and repairing of areas where HVAC renovation is required. Patching and repairing of adjacent materials, and to match the adjacent materials.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product.

1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements

1.3 INFORMATIONAL SUBMITTALS

A. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.

B. Evaluation Reports: For the following, from ICC-ES:

1. Wood-preservative-treated wood.
2. Power-driven fasteners.

3. Powder-actuated fasteners.
4. Expansion anchors.
5. Metal framing anchors.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

A. Certified Wood: Materials shall be produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship:

1. Dimension lumber framing.
2. Miscellaneous lumber.

B. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.
2. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece.
3. Provide dressed lumber, S4S, unless otherwise indicated.

C. Maximum Moisture Content of Lumber: 19 percent for 2-inch nominal unless otherwise indicated.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.

B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.

C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

D. Application: Treat all rough carpentry unless otherwise indicated.

1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.

E. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent.

2.3 DIMENSION LUMBER FRAMING

A. Non-Load-Bearing Interior Partitions: Construction or No. 2 grade.

1. Application: All interior partitions
2. Species:

a. Mixed southern pine; SPIB.
b. Northern species; SPF

2.4 MISCELLANEOUS LUMBER

A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:

1. Blocking.
2. Nailers.
3. Soffits and overhang trim at duct vents
4. Cants.
5. Furring.
6. Grounds.

B. For items of dimension lumber size, provide Construction or No. 2 grade lumber of any species.

C. For concealed boards, provide lumber with 19 percent maximum moisture content and any of the following species and grades:

1. Mixed southern pine; No. 2 grade; SPIB.

2.5 PLYWOOD BACKING PANELS

A. Equipment Backing Panels: DOC PS 1, Exterior, AC Exposure 1, in thickness indicated or, if not indicated, not less than 3/4-inch nominal thickness.

1. Plywood shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.6 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.

1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.

B. Power-Driven Fasteners: NES NER-272.

C. Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers.

2.7 METAL FRAMING ANCHORS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings match existing adjacent materials, and/or or comparable product by one of the following:

1. Cleveland Steel Specialty Co.
2. KC Metals Products, Inc.
3. Phoenix Metal Products, Inc.

C. Allowable Design Loads: Provide products with allowable design loads, as published by manufacturer, that meet or exceed those indicated or manufacturers listed. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

D. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653/A 653M, G60 coating designation.

1. Use for interior locations unless otherwise indicated.

2. Hot-Dip, Heavy-Galvanized Steel Sheet: ASTM A 653/A

653M; structural steel PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, grounds, similar supports to comply with requirements for attaching other construction.

B. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.

C. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.

D. Install fire-retardant treated plywood backing panels with classification marking of testing agency exposed to view.

E. Metal Framing Anchors: Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.

F. Do not splice structural members between supports unless otherwise indicated.

G. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.

H. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.

I. When opening an area for renovation of the HVAC, and the interior is different than indicated on the drawings, notify the COTR before proceeding with the work.

J. Securely attach rough carpentry work to substrate by anchoring and fastening as required, complying with the following:

1. NES NER-272 for power-driven fasteners.
2. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.

3.2 PROTECTION

A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 061000

65.2. *SECTION 062200 -*

MILLWORK PART 1 -

GENERAL

1.1 SUMMARY

A. The Contractor shall furnish all labor, materials, trucking, tools, hoists and other equipment necessary to the upgrading of existing kitchens including the installation of plywood base and wall cabinets for severe use and other incidental items included in this construction documentation. It is the Contractor's responsibility to inspect all kitchens to be upgraded, to make himself/herself fully familiar with the existing conditions and to take all measurements which are necessary to the upgrading work to be completed under the contract.

1.2 INSPECTION/SURVEY

1. The Contractor shall carefully inspect the condition of existing kitchens including, but not limited to, all facilities related to the installation of kitchen cabinets including plumbing and electrical work.
2. Upon the issuance of Notice to Proceed, the Contractor shall survey each kitchen and verify all dimensions for the work specified in the construction documents.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples:

1. Finishes: Manufacturer's standard size for each textured finish indicated and on same backing indicated for Work.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. The kitchen cabinets shall match size and standard of existing cabinets.

B. The installation contract shall include the removal and safe disposal of existing

cabinets and any plumbing connections required for the replacement of cabinets.

C. Install any new plumbing or electrical connections as required, including molding, fillers and other miscellaneous items in accordance with these specifications.

D. Tolerances shall be in accordance with the references stated in Section 6.2.

2.2 MATERIALS

A. Kitchen cabinets shall be all wood as specified in this Section. The use of particle board, flakeboard, or hardboard in the construction of severe use kitchen cabinets and countertops is unacceptable.

B. Wall and base cabinets shall be of the same construction, outside appearance must be the same and must have face frames. Cabinets and countertops shall be constructed of solid lumber and/or exterior grade plywood with wood veneer core. All parts touching floor shall be pressure treated solid lumber. Brace cabinets as necessary to produce sturdy and rigid construction. Provide an integral toe space of at least 3"x3". Only first quality methods, materials and workmanship shall be used.

1. The Contractor shall carefully inspect the condition of existing kitchens including, but not limited to, all facilities related to the installation of kitchen cabinets including plumbing and electrical work.

2. Upon the issuance of Notice to Proceed, the Contractor shall survey each kitchen and verify all dimensions for the work specified in the construction documents.

C. Face frames three fourth inches net thickness of kiln dried solid hardwood, free of knots and selected for light uniform color suitable for natural finish. Frames to be mortised and tennon, dovetailed or doweled, glued and stapled under pressure and filled and sanded. Vertical center members (stiles) to be 1 1/2" wide. Vertical center members between doors and drawers (mulls) to be minimum 2" wide. Horizontal members (rails) to be 1 3/4" wide. Stiles and top and bottom rails to be dadoed to receive ends, bottom and tops.

D. End Panels. Exposed ends shall be minimum 2-2 grade, 1/2" thick 5-ply exterior hardwood plywood, selected for light uniform color. Ends not exposed can be 1/2" exterior softwood plywood, grade A-D, with "A" side to inside of cabinet. Ends shall be dadoed a minimum of 1/4" deep to receive shelves, bottoms and tops. Ends shall be let into dadoes in face frame. Base cabinet end panels shall stop 3 1/2" above the floor and be supported by 3/4" x 3 1/2" pressure treated solid lumber member.

E. Backs. Required on all cabinets (optional on sink bases depending on job conditions). Minimum 1/4" thick 2-2 grade exterior hardwood plywood or A-D grade exterior softwood plywood. Backs shall be securely glued and stapled

to ends, 3 1/2" cleats and shelves of cabinet. Backs may be let into dado of ends and cleats or may be applied flush with ends and cleats.

F. Installation Cleats. Minimum of 3/4" x 3 1/2" S4S, "C" grade, kiln dried solid lumber, dadoes to receive bottoms and tops. Two horizontal members running full length of cabinet at top and bottom required.

G. Shelves and Wall Cabinet Bottoms. One-half inch thick 2-2 grade exterior hardwood plywood or A-D grade exterior softwood plywood with wood banded front edge or 3/4" thick solid lumber. Shelves to be let into dadoes of end panels and braced behind mulls. Bottoms to be let into dadoes in ends, cleats and front frames. Both shall be glued and stapled.

H. Doors. Three-fourth inch thick 7-ply A-D grade exterior hardwood plywood with no more than one veneer joint on the face. Edges reversed shaped to form continuous finger grip around the sides. Edges shall be filled and sanded smooth prior to finish. Edges can be treated with hot foil transfer. Acceptable hardwoods shall be beech, birch, maple or oak.

I. Base Bottoms. One-half inch thick 2-2 grade exterior hardwood plywood or A-D grade exterior softwood plywood. Bottoms shall be let into (rabbet or dado, manufacturers choice) end panels, front rails and installation cleats. Bottom shall be supported by 3/4" thick pressure treated solid lumber braces 24" on center running front to rear and resting on floor.

1. Toe Kicks. Three-fourth inch thick, pressure treated solid lumber.

2. Drawers. Drawer fronts shall be the same specification (4.2.6) as the doors. Sides and backs shall be a minimum of 1/16" thick "C" grade solid lumber with sides dovetailed or mortised and tennon into fronts. Backs shall be dadoed into sides. Drawer bottoms shall be a minimum of 1/4" softwood or hardwood exterior plywood let into front, sides and back. ll drawer parts shall be glued or stapled together. Mount drawers on pair of 75 lb capacity side mounted metal guides. Cabinet members or guides shall be attached at rear to 3/4" solid lumber hanging rail or 1/2" solid lumber or plywood block which is attached to 3/4" solid lumber hanging rail or 1/2" solid lumber or plywood block which is attached to 3/4" solid lumber hanging rail by use of metal rear mount brackets or continuous wraparound method.

3. Finish. Exposed surfaces and interior of cabinet shall be factory finished consisting of stain, sealer and polyurethane coats or an equivalent coating system, lightly sanded between application. Sealer and topcoats must be oven dried. Color shall be selected by the public housing agency from manufacturer's standard colors. Toe kicks shall be painted manufacturer's standard color.

4. Hardware. Provide corrosion resisting hardware. Hinges shall be

manufacturer's standard heavy duty with self-closing feature and shall be face mount or semi-concealed type. Cabinet drawers shall be mounted on metal side rails with 75lb. loading capacity.

J. Countertops.

1. Plastic laminate Countertops shall be fully-post formed type of high-pressure plastic laminate to 3/4" thick exterior plywood with a minimum 4" back splash. The bottom front edge and ends of countertops shall have a solid wood mold. The perimeter of the bottom of countertops and sink cut-outs shall be sealed with polyurethane. The countertop shall include a no-drip front

2. Configurations in accordance with onsite survey and dimensions with standard cut-outs for plumbing. Complete with trim pieces.

3. Fillers and Molding. Scribe mold and fillers shall be utilized to assure accurate job fit. Contractor shall supply cabinet manufacturer with adequate field dimensions.

PART 3 - EXECUTION

3.1 INSTALLATION

A. The Contractor shall supervise and be responsible for the proper locations and installation of all items.

B. The Contractor shall conduct his operations under the contract in such a manner as to allow, at all times during the performance of the work, ingress and egress for the tenants and other authorized persons with the Government’s cooperation.

C. The Contractor shall provide all necessary safety equipment, materials, and personnel to protect the public walks, entrance to buildings and grounds within the work areas of this Contract in order that pedestrians, tenants and the public be protected at all times.

D. The Contractor shall protect and be responsible for the existing buildings, facilities and improvements within the areas of his operations under this Contract. Should any portion of the buildings or areas be damaged, disturbed or otherwise affected due to work of the Contract, the Contractor shall report the conditions and circumstances to the COTR and shall make all necessary repairs and replacements to such damaged work at his own expense and with new materials to match the existing work in every respect, as approved by the Inspector, all existing construction, finishes and other improvements that are to remain and that have been damaged as a result of operation.

E. All work shall be done in a neat clean manner by experienced and capable mechanics.

F. The Contractor shall be responsible for any damage or loss incurred as a result of the work of the Contract to tenants’ property or other work, and shall, at his/her own expense, replace any material which, in the opinion of the Inspector, has become

damaged to such extent that it cannot be restored to its original condition.

G. All items removed by the Contractor, including but not limited to old sinks, old plumbing, cabinets, debris, etc., shall become the property of the Contractor and shall be legally disposed of.

3.2 SUBMITTALS

A. Within 60 consecutive calendar days from notice to proceed the Contractor shall provide two sets of submittals that contain a list of all materials and equipment proposed to be used, giving the manufacturer's name, trade name, catalog number or other positive means of identification for each item. Submittals required shall include Cabinets, Countertops, Faucets, Sinks, Basket Strainers, Under-sink Plumbing

B. In the event that all or any portion of the submitted material is not satisfactory to the COTR, the Contractor shall tender submittals which shall conform to the COTR requirements with 30 consecutive calendar days calculated from the date of rejection of the former submittals. In no event shall the contractor be permitted to tender submittals hereunder beyond 60 days from the COTR's Letter of Award unless duly extended in writing by the COTR.

3.3 SHOP DRAWINGS

A. In addition to the above, shop drawings of sinks, tops and cabinets shall be submitted for approval. Drawings shall also show plans and elevations of each type of kitchen with all dimensions shown.

B. No work shall be fabricated, or materials delivered to the site, until final approval of all shop drawings and other required submittals for that work has been obtained. At the time of submittal, the Contractor shall call to the attention of the COTR, in writing, to any deviations from the Contract documents contained in the shop drawings. The approval of shop drawings containing deviations not specifically brought to the attention of the COTR, or containing errors or omissions of any sort, shall not relieve the Contractor of the responsibility for executing the work in accordance with the Contract documents.

C. The Contractor shall submit copies of all required shop drawings in accordance with the following:

D. The Contractor shall submit two copies of each shop drawing within 30 consecutive calendar days calculated from the date of the COTR's Letter of Award

E. All submittals returned for corrections shall be resubmitted with the required

corrections made within seven consecutive calendar days calculated from the date of rejection.

F. Upon approval, The COTR will then return one copy of all approved submittals to the Contractor.

3.4 CLEANING

A. Upon completion of the work, the Contractor shall assume ownership of all debris resulting from the work, remove it from the premises and legally dispose of it, unless otherwise specified.

END OF SECTION 062200

SECTION 079200 - JOINT

SEALANTS PART 1 -

GENERAL

1.1 SUMMARY

A. Section Includes:

1. Silicone joint sealants.
2. Latex joint sealants.
3. Acoustical joint sealants.

B. The intent for this HVAC renovation is to patch and repair all areas required to install the ducts, pipes and vents, etc. Patch and repair areas to match the adjacent materials.

1.2 PRECONSTRUCTION TESTING

A. Preconstruction Compatibility and Adhesion Testing: Submit to joint-sealant manufacturers four (4) samples of materials that will contact or affect joint sealants. Use ASTM C 1087 or manufacturer's standard test method to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.

B. Preconstruction Field-Adhesion Testing: Before installing sealants, field test their adhesion to Project joint substrates. Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.

1.3 ACTION SUBMITTALS

A. Product Data: For each joint-sealant product indicated.

B. Samples: For each kind and color of joint sealant required.

C. Joint-Sealant Schedule: Include the following information:

1. Joint-sealant application, joint location, and designation.
2. Joint-sealant manufacturer and product name.
3. Joint-sealant color.

1.4 INFORMATIONAL SUBMITTALS

A. Product test reports.

B. Preconstruction compatibility and adhesion test reports.

C. Field-adhesion test reports.

D. Warranties.

1.5 QUALITY ASSURANCE

A. Testing Agency Qualifications: Qualified according to ASTM C 1021 to conduct the testing indicated.

1.6 WARRANTY

A. Special Installer's Warranty: Manufacturer's standard form in which Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Two years from date of Substantial Completion.

B. Special Manufacturer's Warranty: Manufacturer's standard form in which joint-sealant manufacturer agrees to furnish joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: 2 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. VOC Content of Interior Sealants: Sealants and sealant primers used inside the weatherproofing system shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

1. Architectural Sealants: 250 g/L.

B. Low-Emitting Interior Sealants: Sealants and sealant primers used inside the weatherproofing system shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

C. Stain-Test-Response Characteristics: Where sealants are specified to be non-staining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.

2.2 SILICONE JOINT SEALANTS

A. Mildew-Resistant Silicone Joint Sealant ASTM C 920.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following

a. BASF Building Systems.

b. Dow Corning Corporation.

c. GE Advanced Materials - Silicones.

2. Type: Single component (S)

2.3 LATEX JOINT SEALANTS

A. Latex Joint Sealant LS-<#>: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.

1. Manufacturers: Subject to compliance with requirements, provide

products by one of the following

2. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

    a. BASF Building Systems.
    b. Bostik, Inc.
    c. Tremco Incorporated.

2.4 ACOUSTICAL JOINT SEALANTS

A. Acoustical Joint Sealant [AS-<#>]: Manufacturer's standard paintable, no staining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following
2. Basis-of-Design Product: Subject to compliance with requirements, provide product or comparable product by one of the following:

    a. Pecora Corporation .
    b. USG Corporation.

2.5 JOINT SEALANT BACKING

A. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin or any of the preceding types, as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

B. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer.

2.6 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials.

C. Masking Tape: Nonstinging, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions.

1. Remove laitance and form-release agents from concrete block (CMU).
2. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.

B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint- sealant bond; do not allow spillage or migration onto adjoining surfaces.
C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.2 INSTALLATION

A. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
B. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement

capability.

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.

C. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

D. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

E. Acoustical Sealant Installation: Comply with ASTM C 919 and with manufacturer's written recommendations.

F. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.3 JOINT-SEALANT SCHEDULE

A. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal nontraffic surfaces

1. Joint Locations:
   a. Control and expansion joints in unit masonry.
   b. Joints in exterior insulation and finish systems.
   c. Joints between different materials listed above.
   d. Joint areas for the patching and repairing of areas for the HVAC renovation and adjacent materials. Match existing.

2. Joint Sealant: Latex.

B. Joint-Sealant Application: Mildew-resistant interior joints in vertical surfaces

and horizontal non-traffic surfaces

1. Joint Sealant Location:

    a. Joints between plumbing fixtures and adjoining walls, floors, and counters.

    b. Tile control and expansion joints where indicated.

2. Joint Sealant: Silicone.

C. Joint-Sealant Application: Interior acoustical joints in vertical surfaces and horizontal non- traffic surfaces

1. Joint Location: (Where required)

    a. Acoustical joints where indicated.
    b. Other joints as indicated.

2. Joint Sealant: Acoustical.

END OF SECTION 079200

SECTION 085413A - FIBERGLASS DOORS PART 1 - GENERAL

PART 2 - SUMMARY

A. Section includes fiberglass-framed doors.

2.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Include plans, elevations, sections, hardware, accessories, insect screens, operational clearances, and details of installation, including anchor, flashing, and sealant installation.

C. Samples: Not required

D. Product Schedule: For fiberglass doors. Use same designations indicated on Drawings.

2.3 INFORMATIONAL SUBMITTALS

A. Product test reports.

B. Sample warranties.

2.4 QUALITY ASSURANCE

A. Not required

2.5 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to repair or replace fiberglass doors that fail in materials or workmanship within specified warranty period.

1. Warranty Period:

a. Doors: 10 years from date of Substantial Completion.
b. Glazing Units: 10 years from date of Substantial Completion.

PART 3 - PRODUCTS

3.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

B. Basis-of-Design Product: Subject to compliance with requirements, provide product or comparable product by one of the following:

1. Jeld Wen Windows and Doors.

3.2 DOOR PERFORMANCE REQUIREMENTS

A. Product Standard: AAMA/WDMA/CSA 101/I.S.2/A440.

3.3 FIBERGLASS DOORS

3.4 Sliding

A. Frames and Sashes: Pultruded fiberglass complying with AAMA/WDMA/CSA 101/I.S.2/A440 and with exposed exterior fiberglass surfaces finished with manufacturer's standard enamel coating complying with AAMA 613

1. Exterior Color: White
2. Interior Finish: Matching exterior color and finish

B. Insulating-Glass Units: ASTM E 2190.

1. Glass: ASTM C 1036, Type 1, Class 1, q3.

a. Tint: Clear
b. Kind: Fully tempered.
c. U value: 0.3
d. SHGC: 0.17

2. Lites: Six
3. Filling: Fill space between glass lites with argon.

C. Glazing System: Manufacturer's standard factory-glazing system that produces weathertight seal.

D. Hardware, General: Manufacturer's standard corrosion-resistant hardware sized to accommodate sash weight and dimensions.

1. Exposed Hardware Color Match Existing
2. Hinges: Manufacturer's standard type for sash weight and size indicated.

E. Weather Stripping: Provide full-perimeter weather stripping for each operable sash unless otherwise indicated.

F. Fasteners: Noncorrosive and compatible with window members, trim, hardware, anchors, and other components.

3.5 ACCESSORIES

A. Jamb Extensions: Match window.

B. Divided lights

C. Glass-Fiber Mesh Fabric: mesh complying with ASTM D 3656.

1. Mesh Color: Manufacturer's standard

3.6 FABRICATION

A. Fabricate fiberglass doors in sizes indicated. Include a complete system for installing and anchoring windows.

B. Weather strip each operable sash to provide weathertight installation.

C. Provide mullions and cover plates, matching window units, complete with anchors for support to structure and installation of window units. Allow for erection tolerances and provide for movement of door units due to thermal expansion and building deflections. Provide mullions and cover plates capable of withstanding design wind loads of window units.

D. Complete fabrication, assembly, finishing, hardware application, and other

work in the factory to greatest extent possible. Disassemble components only as necessary for shipment and installation. Allow for scribing, trimming, and fitting at Project site.

PART 4 - EXECUTION

4.1 INSTALLATION

A. Comply with manufacturer's written instructions for installing doors, hardware, accessories, and other components. For installation procedures and requirements not addressed in manufacturer's written instructions, comply with installation requirements in ASTM E 2112.

B. Install doors level, plumb, square, true to line, without distortion, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction to produce weathertight construction.

C. Clean exposed surfaces immediately after installing windows. Remove excess sealants, glazing materials, dirt, and other substances.

D. Remove and replace sashes if glass has been broken, chipped, cracked, abraded, or damaged during construction period.

END OF SECTION 085413-A

SECTION 092900 -

GYPSUM BOARD

PART 1 - GENERAL

1.4 SUMMARY

A. Section Includes:

1. Interior gypsum board.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples:

1. Finishes: Manufacturer's standard size for each textured finish indicated and on same backing indicated for Work.

PART 2 - PRODUCTS

2.3 PERFORMANCE REQUIREMENTS

A. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

2.4 GYPSUM BOARD, GENERAL

A. Regional Materials: Gypsum panel products shall be manufactured within 500 miles of Project site from materials that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles of Project site.

2.5 INTERIOR GYPSUM BOARD

A. Manufacturers: Subject to compliance with requirements, provide products by the following

1. American Gypsum.
2. CertainTeed Corp.
3. Georgia-Pacific Gypsum LLC.
4. National Gypsum Company.
5. USG Corporation.

B. Gypsum Board,

1. Thickness: 5/8 inch (Or match existing in thickness)
2. Long Edges: Tapered and featured (rounded or beveled) for prefilling.

C. Moisture- and Mold-Resistant Gypsum Board: ASTM C 1396/C 1396M. With moisture- and mold-resistant core and paper surfaces.

1. Core: 5/8 inch Type X.
2. Long Edges: Tapered.
3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.
4. Thickness: As required by fire-resistance-rated assembly indicated on Drawings.
5. Long Edges: Tapered.
6. Thickness: 5/8 inch .
7. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

D. Water-Resistant Gypsum Backing Board: ASTM C 1396/C 1396M, with manufacturer's standard edges.

1. Manufacturers: Subject to compliance with requirements, provide

products by one of the following:

a. American Gypsum.
b. CertainTeed Corp.
c. Georgia-Pacific Gypsum LLC.
d. USG Corporation.

2.6 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C 475/C 475M.

B. Joint Tape:

1. Interior Gypsum Board: Paper.

C. Joint Compound for Interior Gypsum Board: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.

2.7 AUXILIARY MATERIALS

A. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.

1. Laminating adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

B. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.

C. Sound Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing). (Match existing)

1. Recycled Content of Blankets: Postconsumer recycled content plus one-half of pre-consumer recycled content not less than percent.

D. Acoustical Joint Sealant: ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings as demonstrated by testing according to ASTM E 90.

a. Products: Subject to compliance with requirements, provide the following

b. Grabber Construction Products; Acoustical Sealant GSC.

c. Specified Technologies, Inc.; Smoke N Sound Acoustical Sealant.

1. Acoustical joint sealant shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

PART 3 - EXECUTION

3.5 APPLYING AND FINISHING PANELS

A. Comply with ASTM C 840.

B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

C. Install trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

D. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.

E. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:

1. Level 1: Ceiling plenum areas, concealed areas, and where indicated. (Match existing)

F. Protect adjacent surfaces from drywall compound and texture finishes and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.

G. Remove and replace panels that are wet, moisture damaged, and mold damaged.

END OF SECTION 09200

SECTION 099123 – INTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes surface preparation and the application of paint systems on interior substrates. the following interior substrates:

1. Gypsum board.
2. Metal door Frames
3. CMU masonry walls
4. The intent is the patch and repairing of material where HVAC renovation is installed. Match the adjacent surface materials, and colors.

1.2 DEFINITIONS

A. Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.

B. Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.

C. Walls: Eggshell finish

D. Door Frames and Cased Openings; Semi Gloss

E. Doors: Semi Gloss

F. Wood wall paneling- match existing stain.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.

B. Samples: For each type of paint system and in each color and gloss of topcoat.

C. Product List: For each product indicated. Include printout of current "MPI Approved Products List" for each product category.

1.4 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Paint: 5 percent, but not less than 1 gal. of each material and color applied.

1.5 QUALITY ASSURANCE

A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Architect will select one surface to represent surfaces and conditions for application of each paint system specified in Part 3.

a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft.

b. Other Items: Architect will designate items or areas required.

2. Final approval of color selections will be based on mockups.

a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide product provide one of the products available

1. Duron
2. Sherwin Williams
3. Benjamin Moore
4. No equal Products or Substitutions

2.2 PAINT, GENERAL

A. MPI Standards: Provide products that comply with MPI standards indicated and that are listed in its "MPI Approved Products List."

B. Material Compatibility:

1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

C. VOC Content: Products shall comply with VOC limits of authorities having jurisdiction and, for interior paints and coatings applied at Project site, the following VOC limits, exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

1. Flat Paints and Coatings: 50 g/L.
2. Non-flat (eggshell) Paints and Coatings: 150 g/L.
3. Primers, Sealers,: 200 g/L.

D. Colors: As selected by Architect from manufacturer's full range

2.3 PRIMERS/SEALERS

A. Primer Sealer, Latex, Interior MPI #50.

B. Primer Sealer, Interior, Institutional Low Odor/VOC: MPI #49.

C. Primer, Latex, for Interior Wood: MPI #39.

2.4 WATER-BASED PAINTS

A. Latex, Interior, Eggshell, (Gloss Level 2): MPI #53.

B. Latex, Interior, Semi-Gloss, (Gloss Level 5): MPI #54.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture

meter as follows:

1. Wood: 15 percent.
2. Gypsum Board: 12 percent.

C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

D. Proceed with coating application only after unsatisfactory conditions have been corrected.

1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulates.

1. Remove incompatible primers and re-prime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

3.3 APPLICATION

A. Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."

B. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

C. Examine substrates and conditions for compliance with requirements for maximum moisture content and other conditions affecting performance of the work

D. Metal Door Fame Substrate:
   1. Prime Coat: Metal primer
   2. Intermediate Coat: Latex Interior Semi-Gloss MPI#54
   3. Top coat: Latex interior, Semi-Gloss, MPI#54

E. CMU Masonry Walls:
   1. Prime Coat: (New Block) Latex block filler, interior MPI#4
      a. New Block Primer: Primer Sealer, latex MPI#50
   2. Existing Painted block: Primer Sealer, latex MPI#50
   3. Intermediate Coat: Interior matching top coat
   4. Top coat: Latex interior, Gloss Level #1, MPI#53

F. Gypsum Board Substrate:
   1. Prime Coat: Primer Sealer, latex MPI #53
   2. Intermediate Coat: Latex interior, eggshell MPI #53
   3. Top Coat: Latex, Interior , eggshell, (Gloss Level 1) , MPI #53

G. Painted Wood Door:
   1. Prime coat: Primer , Latex , MPI # 39
   2. Intermediate Coat:, Latex, semi-gloss, MPI # 39
   3. Top Coat: Latex, semi-gloss, MPI #

39 H, Wood Paneling
   1. Stain to match existing.

3.4 CLEANING AND PROTECTION

A. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

B. Wood Substrates: Including doors construction
   1. Latex System:
      a. Prime Coat: Primer, latex, for interior wood
      b. Intermediate Coat: Latex, interior, matching topcoat.

C. Gypsum Board Substrates:

1. Latex System:

    a. Prime Coat: Primer sealer, latex, interior
    b. Prime Coat: Latex, interior, matching topcoat.
    c. Intermediate Coat: Latex, interior, matching topcoat.

END OF SECTION 099123