ASBESTOS ABATEMENT SPECIFICATION

RICHMOND CITY HALL
900 EAST BROAD STREET
RICHMOND, VIRGINIA 23219
RICHMOND CITY HALL RENOVATIONS PHASE III – SUITE 100 & 102

PREPARED FOR:

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RICHMOND, VIRGINIA 23219

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FEI PROJECT NO. FEI-16AM537

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# ASBESTOS ABATEMENT PLAN

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PART 1  GENERAL

1.1 SUMMARY OF WORK

A. RELATED DOCUMENTS: Asbestos Survey Report, Drawings, general provisions of the Contract and requirements specified in the Division 1 sections apply to this work.

B. SCOPE OF WORK: Removals and relocations shall include all work required and inferred to be consistent with the drawings and as necessary to provide completed work starting with the conditions existing prior to commencing work.

C. SPECIFICATION: This section of the specification covers the removal and penetration of asbestos-containing building materials (ACBM’s). At all times an Asbestos Abatement Supervisor and/or Asbestos Project Monitor shall be on site and available while work is taking place. All abatement work shall be done in strict accordance with the specifications. Compliance with all applicable Federal, State, and local procedures, and methods for preparation, execution, cleanup, disposal, and safety are absolutely required. This compliance is the sole responsibility of the Contractor.

D. QUANTITIES: The quantities presented, unless specifically noted as bid quantities, are estimates and shall not be relied upon by the Contractor. The contractor shall field verify all materials, quantities, locations, and field conditions prior to submitting their bid proposal. The Contractor shall coordinate with the Owner’s Project Monitor to verify materials not present as well as materials found.

E. Building materials determined to be asbestos-containing by laboratory analysis or presumed to contain asbestos and scheduled to be abated/disturbed under the scope of this project include the following:

**Suite 102:**
1. Asbestos-containing brown/black mastic associated with green 12”x12” vinyl floor tile (VFT). *(Exposed & Under Carpet)*
2. Asbestos-containing black mastic associated with red 12”x12” vinyl floor tile (VFT). *(Under Carpet)*
3. Asbestos-containing beige 12”x12” vinyl floor tile (VFT) with black mastic. *(Exposed; Under Carpet; and Double Layers)*
4. Asbestos-containing gold/black carpet glue/mastic. *(Typical Throughout Carpeted Areas)*
5. Asbestos-containing black mastic associated with white floor leveling compound. *(Typical Throughout Carpeted Areas)*
6. Presumed asbestos-containing materials (PACM’s) associated with the Vault System, i.e., Vault Door, Gaskets, Walls, etc.
1.2 DESCRIPTION

A. Furnish all labor, materials, services, insurance, and equipment in accordance with the most stringent requirements of EPA and OSHA and all other applicable regulatory agencies, to complete the removal of asbestos-containing materials as described in the Summary of Work. Disturbance of asbestos-containing materials shall only be done by individuals licensed as asbestos-containing Supervisors or Workers.

1.3 SUBMITTAL REQUIREMENTS

A. Pre-work Submittal

1. LICENSES: Submit copies of all state and local licenses and permits necessary to carry out the work including but not limited to contractor license, supervisor licenses, and worker licenses.
2. EQUIPMENT: Submit manufacturer's certification that vacuums, negative pressure equipment, respirators, and air supply equipment meet all requirements of OSHA and EPA. Include descriptions of any equipment to be employed not previously discussed.
3. WORKER TRAINING: The Contractor shall submit a list of the persons who will be employed by him and his subcontractors in the removal work. Present evidence that workers have received proper training required by regulations and the medical examinations required by OSHA 29 CFR 1926.1101. Distinguish between trained, full-time personnel and "pick-up" labor.
4. NOTICES TO SUPPLIERS: Copies of notices sent to suppliers of rental equipment and vehicles informing them of the nature of the use of their equipment.
5. MATERIAL SAFETY DATA SHEET: Submit a Material Safety Data Sheet, or equivalent for each material proposed for use on the work in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200). Include a separate attachment for each sheet indicating the specific worker protective equipment proposed for use with the material indicated and/or manufacturer's specification.

B. Close-Out Submittal

1. Submit certification that rental vehicles and equipment have received clearance inspection by Project Superintendent prior to return to Rental Company.
2. Submit copies of the fully completed Waste Shipment Records (WSR) as documentation of compliance with NESHAP 61.150 (d) (3) and (4).
3. Submit OSHA compliance air monitoring records conducted during the work.
4. Submit copies of the daily progress log.
5. Submit copies of Visitors' Log.
1.4 TERMINOLOGY (Definitions)

A. **ABATEMENT**: Procedure to control fiber release from asbestos-containing building materials.

B. **FOR THIS PROJECT:**
   1. **Removal**: All herein specified procedures necessary to remove asbestos-containing materials from an area and dispose of the materials at an acceptable site in an acceptable manner.
   2. **Post-Removal Surface Encapsulation**: Procedures necessary to coat surfaces from which asbestos-containing materials have been removed to control any residual fiber release.
   3. **Abatement Activities**: Any activity requiring respiratory protection as per this project manual, which disturbs or has the potential to disturb any asbestos-containing building material. This includes, but is not limited to, the following activities: precleaning, installing polyethylene, ACBM removal, encapsulation, and enclosure.

C. **ACBM OR ACM**: Asbestos-containing building materials or asbestos-containing materials.

D. **AIR LOCK**: A system for permitting ingress or egress without permitting air movement from a contaminated area into an uncontaminated area, typically consisting of two (2) curtained doorways at least three (3) feet apart.

E. **AIR MONITORING**: The process of measuring the fiber content of a specific volume of air in a stated period of time. For this project, NIOSH Analytical Method 7400 shall be used. When "aggressive" air sampling is specified, blowers/fans are used to disperse settled fibers into the air during sampling.

F. **AMENDED WATER**: Water to which a surfactant has been added to reduce water surface tension and thereby provide a more rapid penetration.

G. **AUTHORIZED VISITOR**: The Building Owner, the Building Owner's representative, the Architect/Engineer's personnel, or a representative of any regulatory or other agency having jurisdiction over the project.

H. **BARRIER**: Any surface that inhibits air and fiber movement from the work area to non-work areas. Can be comprised of one or a combination of several materials, including but not limited to plywood, polyethylene sheeting, duct tape, and spray-poly. A critical barrier is one that seals any opening (such as doorways, vents, windows, penetrations) between the work area and non-work area.

I. **BUILDING OWNER**: The Owner or his authorized representative.

J. **CURTAINED DOORWAY**: Device to allow ingress or egress from one room to another while permitting minimal air movement between the rooms, typically constructed by placing three overlapping sheets of opaque 6-mil polyethylene over an existing or temporarily framed doorway, securing each along the top of the doorway, securing the
vertical edge of one sheet along one vertical side of the doorway, and securing the vertical edge of the other sheet along the opposite vertical side of the doorway.

I. **DECONTAMINATION ENCLOSURE SYSTEM**: A series of connected rooms, with air locks between any two adjacent rooms, for the decontamination of workers and/or materials and equipment, constructed or moved onto site.

J. **EQUIPMENT DECONTAMINATION UNIT**: Decontamination enclosure system for materials and equipment, typically consisting of a designated area of the work area (wash-down station), a washroom, a holding room, a container room, and an uncontaminated area.

K. **GROSS ABATEMENT AREA**: An asbestos removal area that is sealed and fully contained in polyethylene. Workers enter the abatement area through a decontamination enclosure system.

L. **PERSONNEL DECONTAMINATION UNIT**: A decontamination enclosure system for workers, typically consisting of a designated area of the work area (gross contaminant removal station), an equipment room, an air lock, a shower, an air lock, and a clean room.
   1. **Equipment Room**: A contaminated area or room in the personnel decontamination enclosure system with provisions for storage of contaminated clothing and equipment.
   2. **AIR LOCK**
   3. **Shower Room**: A room between the two (2) air locks in the personnel decontamination enclosure system with hot and cold running water suitably arranged for complete showering during decontamination.
   4. **AIR LOCK**
   5. **Clean Room**: An uncontaminated area or room that is part of the worker decontamination unit with provisions for storage of workers' street clothes and protective equipment.

M. **FIXED OBJECT**: A unit of equipment or furniture in the work area that cannot be removed from the work area without dismantling.

N. **HEPA FILTER**: A high efficiency particulate air (HEPA) filter capable of trapping and retaining 99.97% of asbestos fibers greater than 0.3 microns in length.

O. **HEPA VACUUM EQUIPMENT**: High efficiency particulate air filtered vacuuming equipment with a filter system capable of collecting and retaining asbestos fibers. Filters should be of 99.97% efficiency for retaining fibers greater than 0.3 microns in length.

P. **NEGATIVE AIR PRESSURE EQUIPMENT**: A local exhaust system, capable of maintaining constant, low velocity airflow through the Decontamination Unit and into the Work Area from adjacent uncontaminated areas and exhausting that air outside the building through HEPA filters.

Q. **NIOSH**: National Institute for Occupational Safety and Health.
R. **ON-SITE REPRESENTATIVE:** Owner's full-time representative responsible for air monitoring and site observation. Also referred to as Project Monitor.

S. **PLASTICIZING:** Procedures necessary using polyethylene sheeting, adhesives, and/or taping to seal an area airtight.

T. **POST REMOVAL ENCAPSULATION:** A liquid material which can be applied to surfaces from which asbestos-containing materials have been removed to control the possible release of residual asbestos fibers, either by creating a membrane over the surface (bridging encapsulant) or by penetrating into the material and binding its components (penetrating encapsulant).

U. **SURFACTANT:** A chemical wetting agent added to water to improve penetration, thus reducing the quantity of water required for a given operation or area.

V. **WET CLEANING/WIPING:** The process of eliminating contamination from building surfaces and objects by using cloths, mops, or other cleaning tools which have been dampened with water, and by afterwards disposing of these cleaning tools as asbestos-contaminated waste.

1.5 **CODES AND REGULATIONS**

A. **GENERAL APPLICABILITY OF CODES, REGULATIONS, AND STANDARDS:** Except to the extent that more explicit or more stringent requirements are written directly into the contract documents, all applicable codes, regulations, and standards have the same force and effect (and are made a part of the contract documents by reference) as if copied directly into the contract documents, or as if published copies are bound herewith.

B. **FEDERAL REGULATIONS:** Those which govern asbestos abatement work or hauling and disposal of asbestos waste materials include but are not limited to the following:

1. US Department of Labor, Occupational Safety and Health Administration, (OSHA), including but not limited to:
   a. **Asbestos Regulations** - Title 29, Part 1910, Section 1001 of the Code of Federal Regulations
   b. **Respiratory Protection** - Title 29, Part 1910, Section 134 of the Code of Federal Regulations
   c. **Construction Industry** - Title 29, Part 1926, Section 1101 of the Code of Federal Regulations
   d. **Access to Employee Exposure & Medical Records** - Title 29, Part 1910, Section 20 of the Code of Federal Regulations
   e. **Hazard Communication** - Title 29, Part 1910, Section 1200 of the Code of Federal Regulations
   f. **Specifications for Accident Prevention Signs and Tags** - Title 29, Part 1910, Section 145 of the Code of Federal Regulations
2. US Environmental Protection Agency (EPA) including but not limited to:

   Worker Protection Rule
   40 CFR Part 763, Subpart G
   Federal Register, Vol. 50, No. 134, 7/12/85
   P28530-28540

   a. Regulation for Asbestos - Title 40, Part 61, Subpart A of the Code of Federal Regulations
   c. Asbestos Hazard Emergency Response Act (AHERA) - 40 CFR Part 763

3. US Department of Transportation (DOT) including but not limited to:

   a. Hazardous Substances: Final Rule - Regulation 49 CFR, Parts 171 and 172

C. STATE AND LOCAL REGULATIONS: Abide by all state and local regulations which govern asbestos abatement work or hauling and disposal of asbestos waste materials, including but not limited to:

1. Virginia Department of Labor and Industry

   a. Licensed Asbestos Contractor Notification, Asbestos Project Permits, and Permit Fees Regulations VR 425-01-74

2. Virginia Department of Environmental Quality

   a. Solid Waste Regulations VR 672-20-10

D. STANDARDS: Those which discuss asbestos abatement work or hauling and disposal of asbestos waste materials are not limited to the following:

1. American National Standards Institute (ANSI)

   a. Fundamentals Governing the Design and Operation of Local Exhaust Systems, Publication Z9.2-79
   b. Practices for Respiratory Protection, Publication Z88.2-80

E. EPA GUIDANCE DOCUMENTS: Those that discuss asbestos abatement work or hauling and disposal of asbestos waste materials are listed below only for the Contractor's information. These documents do not describe the work and are not a part of the work of this contract.

1.6 ASBESTOS ABATEMENT PHASING

A. Asbestos abatement work shall be scheduled and coordinated with the General Contractor and Owner’s Project Monitor. No abatement activities shall take place without the knowledge of the Owner’s Project Monitor. To do so would be a breach of contract with the Owner.
PART 2 EQUIPMENT AND MATERIALS

2.1 PERSONNEL PROTECTION REQUIREMENTS

A. Prior to commencement of work, the workers shall be instructed and shall be knowledgeable on the hazards of asbestos exposure, use and fitting of respirators, protective clothing, decontamination procedures, and all aspects of asbestos work procedures; workers shall have medical examinations.

B. The Contractor acknowledges that he alone is responsible for enforcing personnel protection requirements and that these specifications provide only a minimum acceptable standard for each phase of operation.

C. Provide workers with personally issued and marked respiratory equipment approved by NIOSH and accepted by OSHA.

D. WHERE NOT IN VIOLATION OF NIOSH AND OSHA REQUIREMENTS, THE CONTRACTOR SHALL PROVIDE, AS A MINIMUM, THE FOLLOWING RESPIRATOR PROTECTION FOR EACH PHASE OF OPERATION:

1. Precleaning/Wet Wiping of Area: No respiratory protection is required in this phase.
2. Plastic Installation: No respiratory protection is required in this phase.
3. Asbestos Removal: MSHA/NIOSH half-face dual cartridge respirators equipped with HEPA cartridges. If mastic solvents are to be utilized on site, appropriate respiratory protection is required in accordance with the manufacturers recommendation.
4. Plastic Removal: MSHA/NIOSH half-face dual cartridge respirators equipped with HEPA cartridges.
5. Loading Waste Material on Truck (outside work area): MSHA/NIOSH half-face dual cartridge respirators equipped with HEPA cartridges.
6. Unloading Bags at Landfill: MSHA/NIOSH half-face dual cartridge respirators equipped with HEPA cartridges.

E. The above schedule is the minimum respiratory protection acceptable. Should any condition, for any reason, be encountered where the exposure level, after application of the appropriate protection factor of the respiratory equipment in use, exceeds 0.01 f/cc, substitute respiratory equipment with protection factors that reduce worker exposure levels below 0.01 f/cc.

F. No visitors shall be allowed in work areas, except as authorized by the Owner.

G. Provide workers with sufficient sets of disposable protective full-body clothing. Such clothing shall consist of full-body coveralls, footwear, and headgear as manufactured by Kimberly Clark "Kleenguard", one-piece coveralls or equal. Provide eye protection and hard hats as required by applicable safety regulations. Reusable type protective clothing and footwear intended for reuse shall be left in the Contaminated Equipment Room until the end of the asbestos abatement work at which time shall be disposed of as asbestos waste. Disposable clothing shall not be allowed to accumulate and shall be disposed of as contaminated waste.
H. Provide authorized visitors, including the Owner’s Project Monitor, with suitable protective clothing, headgear, footwear, and gloves as described above whenever they are required to enter the work area.

2.2 MATERIALS

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

1. Store all materials subject to damage off the ground, away from wet or damp surfaces, and under cover sufficient to prevent damage or contamination.
2. Damaged or deteriorating materials shall not be used and shall be removed from the premises. Material that becomes contaminated with asbestos shall be disposed of in accordance with applicable regulations.

B. PLASTIC SHEETING: Flame retardant polyethylene sheeting shall be used where applicable to comply with fire code requirements.

C. TAPE: Capable of sealing joints of adjacent sheets of polyethylene and for attachment of polyethylene sheets to finished or unfinished surfaces of dissimilar materials and capable of adhering under both dry and wet conditions, including use of amended water, duct tape, poly prep tapes or approved equal.

D. ADHESIVES: Capable of sealing joints of adjacent sheets of polyethylene and for attachment of polyethylene sheet to finished or unfinished surfaces of dissimilar materials and capable of adhering under both dry and wet conditions, including use of amended water.

E. CAULKS: Not Applicable.

F. SURFACTANT: Shall consist of 50% polyoxyethylene ether and 50% of polyoxyethylene ester, or equivalent, and shall be mixed with water to provide a concentration of one ounce of surfactant to 5 gallons of water. Use "Aqua-Gro" by Aquatrols Corp. of America, Pennsauken, New Jersey, or approved equal. Prior to bidding, the Contractor shall be responsible for verifying that this surfactant is compatible with the materials to be removed and their substrates. If found to be incompatible, the Contractor shall supply suitable wetting agents at no extra cost to the Owner.

G. IMPERMEABLE CONTAINERS: Suitable to receive and retain any asbestos-containing or contaminated materials until disposal at an approved site. The containers shall be labeled in accordance with OSHA Regulation 29 CFR 1926.1101 and NESHAP Regulation 40 CFR 61, Subpart M. Containers must be both air and watertight and must be resistant to damage and rupture.

H. WARNING LABELS AND SIGNS: As required by OSHA regulations 29 CFR 1926.1101.
CITY HALL SUITE 100 & 102 RENOVATIONS
Richmond City Hall Renovations Phase III
City of Richmond, Virginia

I. GLOVE BAGS: Safe-T-Strip as manufactured by Asbeguard Equipment, Inc., 130 Esna Park Drive, Markham, Ontario, Canada, L3R 1E3, Profo-Bag as manufactured by Asbestos Control Technology, Inc., P. O. Box 183, 38 North Pine Avenue, Maple Shade, New Jersey, 08052, or approved equal.

J. ENCAPSULANTS: American coatings Corporation, Cable Coating 22P, penetrating encapsulant; Better Working Environments, Inc., removal encapsulant; and Cable Coating 2B, bridging encapsulant, as applicable, or approved equal.

K. MASTIC REMOVER: Shall be commercially available product formulated for the removal of mastics, shall have closed cup flashpoint of 140 degrees F. or higher, (NFPA Class III), shall contain no chlorinated compounds, and shall contain no compounds which could render the waste as hazardous waste for disposal. Products which meet these requirements include, but are not limited to De-Solv-It, and ADL-1 by Orange-Sol; Foster 32-69 by H.B. Fuller Company; Sentinel 7200 Mastic Remover by Sentinel Chemical Company; Certane 77 by Certified Technologies Corporation; and Orange Stuff by L. Scheid, Inc.

L. OTHER MATERIALS: Provide all other materials, such as, but not limited to lumber, plywood, nails, and hardware, which may be required to properly prepare and complete this project.

2.3 TOOLS AND EQUIPMENT

A. Provide suitable tools for asbestos removal.

   1. Water Sprayer: Airless or a low-pressure sprayer for amended water application as applicable.
   2. Air-Purifying Equipment: High Efficiency Particulate Air Filtration Systems (HEPA) shall comply with ANSI Z9.2-79. No air movement system or air equipment should discharge asbestos fibers outside the work area. Thus, the negative air unit shall be equipped with a three filter bank with the last being the HEPA filter capable of removing 99.97% of fibers >0.3 μ (microns).
   4. Scaffolding: As required to accomplish the specified work and meet all applicable safety regulations.
   5. Vacuums: Use HEPA type such as Nilfisk GA 73, or approved equal.
   6. Other tools and equipment as necessary.
PART 3 EXECUTION OF ABATEMENT

3.1 POSTING OF THE PROJECT

A. Post caution signs in and around the work area to comply with OSHA regulation 29 CFR 1926.1101 and in compliance with all other Federal, State, and local requirements.

B. As required by OSHA regulations 29 CFR 1926.1101, warning shall bear the following information:

**DANGER**

**ASBESTOS**

**CANCER AND LUNG DISEASE HAZARD**

**AUTHORIZED PERSONNEL ONLY**

**RESPIRATORS AND PROTECTIVE CLOTHING ARE REQUIRED IN THIS AREA**

C. Remove signs upon completion of abatement.

3.2 WORK AREA PREPARATION

A. Before the work is begun, and unless otherwise specified, the Owner shall remove from work areas, all removable items and equipment not located on the asbestos material as specified. Owner shall later replace furniture and movable objects only after the Project Monitor specifies the area is safe for reoccupancy.

3.3 WORK AREAS - WORK BY CONTRACTOR

A. Preclean fixed objects within the work area, first using HEPA vacuum equipment and then wet cleaning methods as appropriate. Mechanical and/or electrical equipment which is still operable and used to run the daily operations of the building systems shall not be included in the work area. This equipment shall be properly vented in accordance with the manufacture’s specifications.

B. If required, the Contractor shall coordinate with the Owner to shut down electric power to work areas. The Contractor may use existing electrical service to the building for temporary electrical power during abatement work.

C. Prior to commencing abatement work, the Contractor shall coordinate with the Owner to shut down and isolate heating, cooling, and ventilating air systems to prevent contamination and fiber dispersal to other areas of the building. Seal any vents within the work area with tape and 6-mil plastic sheeting.
D. Clean work areas where debris or visible dust is present and in areas where floor materials are not being removed. Clean the work area first using HEPA vacuum equipment and then wet cleaning methods as appropriate. Do not use methods that raise dust, such as dry sweeping or vacuuming with equipment not equipped with HEPA filters. Do not use HEPA vacuum equipment on wet surfaces unless units are specially constructed for wet/dry use. Do not use HEPA vacuum equipment on gypsum board or other material that would be damaged by the wetting agent. HEPA vacuum or damp sponge with regular water would be appropriate.

E. Seal off all openings, including but not limited to windows, corridors, doorways, skylights, ducts, grilles, diffusers, and any other penetrations of the work areas, with 6-mil plastic sheeting sealed with tape (Critical Barriers).

F. Prepare areas undergoing abatement in accordance with the following requirements. Areas undergoing multiple removal operations shall be prepared in accordance with the most stringent requirements as follows:

1. **Vinyl Floor Tile and Mastic:** In areas where asbestos vinyl floor tile and mastic is being removed from an entire room a negative pressure work area shall be established. Critical barriers shall be installed over windows, doors, and openings (i.e. HVAC diffusers, returns, exhaust fans, etc.). Splash Guards shall be installed on the walls and columns, which are not scheduled for demolition and extend a minimum of four-feet (4’) in height from the floor. The critical barriers and splashguards shall consist of 6-mil polyethylene sheeting. A two-stage decontamination chamber (without a shower) may be used if the materials are removed in a manner where they are not deemed friable. Vinyl floor tile and mastic shall be removed in accordance with Section 13280, Paragraph 3.14.

G. Maintain and mark emergency exits from the work areas, or establish alternate exits satisfactory to the local fire marshal.

### 3.4 DECONTAMINATION ENCLOSURE SYSTEMS

A. **GENERAL:** The Contractor shall use portable decontamination units acceptable to EPA and OSHA, connected to the work area with framed-in or accordion tunnels, if necessary, and line the tunnels with plastic, sealed with tape at all joints in the plastic, or shall construct decontamination units on-site.

B. **ACCESS:** In all cases, access to contained areas shall be through an air lock. In all cases, access between any two rooms within the decontamination enclosure system shall be through an air lock.

C. **WORKER DECONTAMINATION ENCLOSURE SYSTEM:** Construct a worker decontamination enclosure system contiguous to the work area consisting of three totally enclosed chambers as follows:

1. An equipment room with two (2) curtained doorways, one to the work area and one to the shower room, via an air lock.
2. A shower room with two (2) curtained doorways, one to the equipment room and one to the clean room, via air locks. The shower room shall contain at least one
shower with hot and cold or warm water with individual shut-off valves inside the showers. Careful attention shall be paid to the shower enclosure to insure against leakage of any kind. Ensure a supply of soap at all times in the shower room. Drainage from showers shall be disposed of as contaminated water or filtered as specified below.

3. Waste water containing asbestos, including drainage from decontamination showers, shall be either disposed of as contaminated waste or filtered in accordance with federal, state, and local requirements prior to introduction into the sanitary sewer system.

4. A clean room with one curtained doorway into the shower (via an air lock) and one entrance or exit to noncontaminated areas of the building. The clean room shall have sufficient space for storage of the workers' street clothes, towels, and other noncontaminated items.

D. **EQUIPMENT DECONTAMINATION ENCLOSURE SYSTEM**: Provide or construct an equipment decontamination enclosure system consisting of two totally enclosed chambers as follows:

1. A washroom, constituting an air lock, with a curtained doorway to a designated area of the work area and a curtained doorway to the holding area.
2. A holding area, constituting an air lock, with a curtained doorway to the washroom and a curtained doorway to the uncontaminated area.
3. Contractor may elect to construct equipment decon unit on side of equipment room of worker decontamination unit.

3.5 **MAINTENANCE OF DECONTAMINATION ENCLOSURES**

A. At the beginning of each work shift and throughout removal, all seals and curtained doorways shall be inspected, and if not found in proper condition, repaired immediately.

B. Respiratory equipment shall be cleaned, repaired, and sanitized after each use.

C. Soap and shampoo shall be in the showers at all times.

D. Fresh towels shall be available at all times.

E. All areas shall be kept clean and in order.

F. Provide a disposal bag for contaminated filters in the shower room.

G. Provide storage for wet and dry towels.

H. Ensure that the drainage filtering systems are kept clean and operable at all times.

I. At the end of each decontamination period, the shower, air locks, and clean room shall be cleaned and dried.
J. At the end of each work shift: the two air locks and the shower shall be thoroughly disinfected; the filter bag (if applicable) shall be returned to the equipment room for disposal; the equipment room and first air lock shall be thoroughly HEPA vacuumed and wet cleaned.

3.6 WORKER PROTECTION

A. All workers and authorized personnel, in order to enter the work area, shall:
   1. Don protective clothing (coveralls, gloves, boots, etc.). Two suites may be worn in lieu of a shower facility.
   2. Don the appropriate respiratory protection, following all training procedures and manufacturer's instructions. Hood shall be worn over respirator straps.

B. All workers and authorized personnel, in order to leave the work area, shall:
   1. Remove gross (visible) contamination from themselves and their equipment with the use of a HEPA Vacuum.
   2. Respirator still in place, remove the exterior suit and move to the clean area.
   3. Remove the second suit and return respirator to the storage area.
   4. No smoking, eating, or drinking shall be allowed inside the work area.

3.7 COMMUNICATIONS

A. Provide an electronic communications system suitable for inside or outside, and inter-room communications, in order to monitor all activities within the work area and to readily transfer messages from one location to another.

3.8 FIRE EXITS

A. Designate and maintain emergency and fire exits from the work area in accordance with local codes and regulations. All exits shall be clearly marked with fluorescent tape or red enamel and shall be clearly visible from any part of the work area.

3.9 SECURITY

A. Make all necessary provisions for 24-hour building security for areas designated for this project. The Contractor shall be responsible for maintaining security of the abatement areas throughout the contract period.

3.10 LOCATION AND ACTIVATION OF NEGATIVE AIR PRESSURE

A. Maintain negative pressure system in the work areas during all asbestos abatement work for which gross abatement techniques are specified or required.

C. Provide one spare exhaust unit per three units at all times. Spare exhaust units shall be of the same size and capacity as the largest operating units.

D. Suspend electrical cords off the floor and out of workers' way to protect the cords from damage from traffic, sharp objects, and pinching. Do not fasten cords with staples, and do not hang cords from nails or suspend with wire.

E. Provide number of exhaust units in each work area to provide one air change every 15 minutes in all locations of the work areas.

F. Locate units so that make-up air enters the work area primarily through the decontamination facility and traverses the work area as much as possible. Use Section J.3 of the EPA document, Guidance for Controlling Friable Asbestos-Containing Materials in Buildings, "Purple Book", June 1985. It is recommended units be relocated, within the work area, during the removal process to ensure proper air changes within the immediate work area.

G. Provide additional make-up air openings as shall be necessary to effectively move air through the work area and to avoid creating too high a pressure differential that would damage or cause "blown-in" of temporary barriers and plastic coverings. Provide inlets by making openings in the plastic sheeting near the ceiling and as far as possible from the exhaust units. Provide self-closing polyethylene flaps over the openings to prevent backflow of air from the contained area to the outside.

H. Provide minimum number of auxiliary make-up air openings to maintain negative pressure. A negative pressure in excess of 0.02 inches of water differential shall be maintained.

I. Vent all exhaust units to the outside of the building. Provide flexible or rigid duct as necessary to provide exterior venting and proper location of exhaust units. Ducts shall be completely sealed, in good repair, and protected from possible damage within the work area.

J. After the work area has been prepared, the decontamination facility set up, and the exhaust units installed, start the units (one at a time if more than one is provided). Visually check the direction of air movement through the openings in the barriers, and verify movement of air in all locations of the work areas by use of ventilation smoke tubes. Adjust the location of exhaust units, or provide additional exhaust units for the work area if the test indicates inadequate or improper air movement.

K. After removal has begun, maintain operation of exhaust units continuously to maintain a constant negative pressure until decontamination of the work area is complete. Do not turn units off at the end of the work shift or when removal operations temporarily stop.

L. Change filters in exhaust units in accordance with manufacturer's recommendations and Paragraph J.3.2.2.1 of the EPA document, Guidance for Controlling Friable Asbestos-Containing Materials in Buildings, "Purple Book", June 1985 or when there is obvious loss of negative pressure.
M. When a final inspection and the results of the final air monitoring tests indicate an acceptable level of airborne fibers, remove and dispose of prefiltrers and shut off the exhaust units. If the exhaust units are to be used in another work area, leave the final filter in place and seal all intake openings to the unit to prevent contamination due to asbestos fibers collected on the final filter. If the exhaust units are not to be used in other work areas, remove the final filter and dispose of as contaminated waste.

N. If dismantling operations result in visible dust on surfaces, replace filters, restart exhaust units, reclean surfaces and perform additional area air monitoring (at Contractor's expense) until the level of airborne fibers is acceptable as specified.

O. Dispose of all filters as asbestos-contaminated waste material as specified.

3.11 EQUIPMENT REMOVAL PROCEDURES

A. Clean external and internal surfaces of all nonfixed equipment and/or objects by thoroughly wet wiping and/or rinsing, before moving such items into the Equipment Decontamination Unit for final cleaning and removal to uncontaminated areas.

B. Objects and equipment removed shall be stored in areas designated by the Owner.

3.12 VISUAL INSPECTIONS

A. Upon completion of each phase of work area activities and before the next phase work activities are to begin, notify the Project Monitor that the work area is ready for inspection.

B. The Contractor shall not begin the next work activities until the Project Monitor has inspected the area and any deficiencies have been corrected.

C. The Project Monitor with the Contractor present will perform the following minimum schedule of inspections.

1. Prior to the initiation of any site activities (document condition of existing site).
2. After area pre-cleaning and prior to preparation of work area with plastic sheeting.
3. After work area preparation with plastic sheeting and prior to start of abatement.
4. After fine cleaning and before encapsulation.
5. After Final Clearance and all barriers are removed.

3.13 GROSS REMOVAL OPERATIONS

A. Any housings, grills, vents, or penetrations concealing asbestos-containing materials shall be removed to provide access to the materials.

B. Spray asbestos-containing materials with amended water, using spray equipment capable of providing a “mist” application to reduce the release of fibers. Saturate the material sufficiently to wet it to the substrate without causing excessive dripping. The use of high RPM power equipment, pressure washers, or hydroblasters shall not be acceptable without special written permission from the Designer. Remove the saturated asbestos material in small sections from all areas. Material drop shall not exceed fifteen feet (15').
For heights up to fifty feet (50’), provide inclined chutes to intercept drop. For heights exceeding fifty feet (50’), provide enclosed, dust proof chutes. Material shall not be allowed to dry before placing in sealable polyethylene bags of 6-mil minimum thickness. All material shall be removed thoroughly and totally. Nylon fiber brushes shall be used to clean asbestos fibers from rough surfaces. No asbestos-containing material is to remain for any reason. Any contaminated material capable of puncturing the polyethylene bags shall be packaged separately.

C. Maintain work areas free of accumulated asbestos-containing materials at all times. Keep waste materials wet until enclosed in sealed plastic bags.

D. Seal all polyethylene bags airtight. Move the bagged material to the wash-down station adjacent to the equipment decontamination enclosure. Once inside the washroom, the bags shall be wet cleaned or HEPA vacuumed and passed into the holding room. Single bagged material shall be placed in a clean bag or into a lined drum. At no time shall a removal worker pass the curtained doorway between the holding room and the container room.

E. Ensure all disposal containers are properly labeled in conformance with 29 CFR 1926.1101 and 40 CFR 61. Refer to Section 13280, Paragraph 1.5 - Codes and Regulations of this section.

F. The Contractor shall mobilize truck and/or dumpster to entrance of staging area to load out asbestos-containing materials (double bagged). This load out procedure shall be conducted in a manner to avoid public view. The Contractor shall maintain this load out practice at all times during load out.

3.14 ASBESTOS FLOOR TILE REMOVAL

A. The building owner shall remove all appliances and furniture from the working area prior to the removal of asbestos floor tile.

B. Prepare the area in accordance with Section 13280 Paragraph 3.3.

C. Remove non-asbestos binding strips or other restrictive molding from doorways, walls, etc. clean and dispose of as non-asbestos waste.

D. Floor tile being removed in areas not undergoing friable removal shall be removed in accordance with the following:

1. Wet floor with amended water, removal encapsulant, or detergent solution, so that entire surface is wet. Do not allow to puddle or run off to other areas. If a removal encapsulant is used, use in strict accordance with Manufacturer’s Instructions. Cover with sheet polyethylene to allow humidity to release tile from floor. Allow time for humidity and water or removal encapsulant to loosen tiles prior to removal.

2. Remove loose tiles and wrap manageable stacks of tiles in two layers of 6-mil polyethylene. Continue wetting during removal and take care not to break the tiles.

3. Tiles, which do not come loose after saturation, will be removed using methods that minimize the breakup of individual tiles. Continue wetting during removal.
4. Sanding of the tiles or adhesive is not permitted.

E. The adhesive shall be removed by scraping under wet conditions. The adhesive shall be removed such that, when completed, there are no remaining ridges or undulations of adhesive and no further preparation is required for the floor to be retiled. If using a commercial mastic remover (Reference Section 13280, Paragraph 2.2. of this section) use MSHA/NIOSH half-face dual cartridge respirators equipped with HEPA cartridges and any "piggy back" cartridges specified by the MSDS.

F. If a mastic solvent is used, remove all traces of the removal solvent to prevent problems with replacement flooring in accordance with the manufacture’s recommendation. At the completion of all work, leave the substrate in such a state as to comply with all requirements and recommendations of manufacturer of replacement flooring.

G. All refuse shall be disposed of as asbestos-containing waste in accordance with Section 13280 Paragraph 3.15, Disposal Of Asbestos-Containing Waste.

H. Ensure all disposal container are properly labeled in conformance with 29 CFR 1926.58 and 40 CFR 61. Refer to Section 13280 Paragraph 1.5 - Codes and Regulations of this section.

3.15 DISPOSAL OF ASBESTOS-CONTAINING MATERIAL AND ASBESTOS CONTAMINATED WASTE

A. As the work progresses, and to prevent exceeding available storage capacity on site, workers from uncontaminated areas in full protective clothing and dual cartridge respirators shall enter the equipment decontamination unit and place the appropriate supply of specified containers within the container room. Workers in the holding room shall be passed empty containers for receiving bagged material. Full sealed containers from the holding room shall be passed back into the container room for storage. Ensure all curtained doorways are closed. Ensure that all containers are sealed properly before removing for transport and disposal. At no time shall a removal worker pass the curtained doorway between the holding room and the container room. Drums will not be required if Contractor uses sealed bins or enclosed trucks to store and transport double-bagged waste. Approval must be obtained from the Asbestos Designer prior to employment of this method.
1. **LABEL REQUIREMENTS:** Provide labels affixed to all asbestos waste containers:

   a. Warning labels as required by OSHA regulation 40 CFR 1926.1101 as follows:

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

   b. Informational labels as required by NESHAP regulation 40 CFR 61, Subpart M with the name of the waste generator and the location at which the waste was generated. If handwritten, use, at a minimum, indelible ink to legibly record the required information.

B. Vehicles used for transporting asbestos-containing materials to disposal sites shall have a completely enclosed, lockable storage compartment if drum requirement is to be deleted. Storage compartments shall be plasticized and sealed with a minimum of one (1) layer of 6-mil polyethylene on the sides and top and two (2) layers of 6-mil polyethylene on the floor. The compartments shall be thoroughly wet cleaned and/or HEPA vacuumed following the disposal of each load of material at the dumpsite. At the conclusion of the project (or before transport vehicles are used for other purposes), the polyethylene shall be properly removed and disposed of as contaminated waste. After this is accomplished, compartments shall once again be wet cleaned and/or HEPA vacuumed in order to eliminate all debris prior to reuse of the vehicles. Rented vehicles shall receive clearance inspection prior to being returned to the rental company. All plastic sheeting, tape, cleaning material, including mops and sponges, clothing, filters, and all other contaminated disposable materials shall be packaged, labeled, and disposed of as asbestos-containing waste.

1. **TRANSPORT SIGN REQUIREMENTS:** Provide signs during waste transport and disposal as follows:

   a. As required by the US Department of Transportation, 49 CFR 171 and 172, warning signs shall display the following:

   **RQ HAZARDOUS**
   **SUBSTANCE**
   **SOLID, NOS**
   **ORM-E, NA 9188**
   **(ASBESTOS)**
b. As required by NESHAPS, 40 CFR 61, Subpart M, mark vehicle used to transport asbestos-containing waste material during the loading and unloading of the waste so that the signs are visible as follows:

DANGER

ASBESTOS DUST HAZARDS

CANCER AND LUNG DISEASE HAZARD

AUTHORIZED PERSONNEL ONLY

A. Dispose of materials at an authorized disposal site in accordance with the requirements of federal, state, and local disposal authorities.

B. Workers unloading waste material at the disposal site shall be dressed in full-body protective clothing and half-face negative pressure dual cartridge respirators.

3.16 GROSS CLEANUP

A. Remove all visible accumulations of asbestos-containing materials and debris by HEPA vacuums, sponging, etc. Wet clean all surfaces within the work area.

B. The entire work area shall be totally, visibly clean. The Contractor shall notify the Owner’s Certified Industrial Hygienist/Project Monitor of the time the work area will be subject for visual inspection. This inspection shall be certified by the Contractor and will be verified by the representative using the "Certification of Visual Inspection" found in the Testing Section.

3.17 POST-REMOVAL ENCAPSULATION OF AFFECTED AREAS

A. The work area shall have passed visual inspection prior to post-removal encapsulation.

B. An approved encapsulant shall be applied, using airless spraying equipment, to all areas of the project where asbestos-containing materials have been removed. Encapsulant shall be colored for ready visibility.

C. ENCAPSULANTS

1. The encapsulant shall be compatible with the replacement material as per manufacturer advice and approval by Architect/Engineer.

2. If any encapsulant is incompatible with the substrate, the Contractor shall be fully responsible for providing an alternate encapsulant that is compatible, at no additional cost to the Owner.

3. Upon completion of encapsulation of surfaces from which asbestos has been removed, the Contractor shall inform the on-site representative that the area is ready for compliance monitoring.
3.18 RE-ESTABLISHMENT OF OBJECTS AND SYSTEMS

A. Fixtures, equipment, or objects relocated by the contractor to storage areas designated by the Owner shall be reestablished under this contract as to their exact position and material shape. Contractor assumes full responsibility for damage to objects on premises.

END OF SECTION 13280
SECTION 13281 - ASBESTOS AIR MONITORING/TESTING

PART 1   GENERAL

1.1 TESTING/AIR MONITORING

A. Throughout the entire removal and cleaning operations, air monitoring will be conducted by an accredited Project Monitor to ensure Contractor compliance with EPA and OSHA regulations, excluding personnel samples required by OSHA, and any additional applicable state and local government regulations. Air monitoring results gathered by the Owner’s laboratory will not be used by the Contractor to verify OSHA compliance. Air monitoring for OSHA compliance by the Contractor shall be conducted according to the method prescribed by 29 CFR 1926.1101, Appendix A or applicable state or local regulations.

B. Air monitoring shall be conducted by a Project Monitor licensed by the Virginia Department of Professional and Occupational Regulation pursuant to the requirements of Title 54.1, Chapter 5 of the Code of Virginia.

C. Air monitoring will be performed by an independent firm. Selection of and payment to the Project Monitoring Firm will be made by the Owner.

D. The Contractor shall be responsible for providing personal monitoring of his employees as per OSHA 1926.1101. Any testing required by Contractor in addition to that listed below and all costs of any retesting necessitated by failure to pass compliance monitoring shall be paid for by Contractor.

E. Monitoring Prior to Actual Removal: The environmental health testing laboratory will provide area monitoring and establish the reference baseline ambient fiber concentrations 24 hours prior to the masking and sealing operations for each removal site. A volume of air sufficient to obtain a limit of quantification of 0.01 fibers/cc shall be secured. Field blanks shall be secured in accordance with the latest revision of the NIOSH 7400 Method.

F. Monitoring During Asbestos Removal: The Project Monitor will provide environmental and work area monitoring, for the Owner, during exposure to airborne concentrations of asbestos.

   1. If monitoring outside the asbestos control area shows airborne concentrations exceeding the reference baseline ambient fiber concentration and is due to the abatement contractor’s work practices or breach in the containment, the Contractor shall stop all work, notify the Owner immediately, identify and correct the condition(s) causing the increase.

G. Monitoring Results During Asbestos Abatement: PCM fiber counting shall be completed and results reviewed by the Project Monitor within 24 hours after conducting sampling. The Project Monitor shall notify the Contractor and the Owner immediately of any exposures to asbestos fibers greater than or equal to 0.01 fibers/cc.

   1. The services of a testing laboratory will be employed by the Owner’s Project Monitor to perform laboratory analysis of the air samples. A microscope and technician will be set up at the job site, or samples will be sent daily to a laboratory, so that written reports on air samples can be obtained within 24 hours of conducting sampling. A complete record, certified by the testing laboratory, of all air monitoring tests and results will be furnished to the Owner's Representative, the Owner, and the Contractor.
H. Final Compliance Monitoring: Final Compliance Monitoring shall be conducted and analyzed by Phase Contrast Microscopy (PCM). The Owner’s Project Monitor will conduct final air clearance monitoring. Sampling shall start after the following:

1. HEPA vacuuming and wet cleaning of all surfaces of the work area must have been conducted.
2. All visible accumulations of asbestos-containing waste material must have been removed from the work area, as determined by the Contractor’s Supervisor and Owner’s Project Monitor.
3. First polyethylene layer must have been removed from walls and floors.
4. Completion of a satisfactory visual inspection by the Project Monitor.
5. The area completely covered by a spray encapsulant.
6. All surfaces within the regulated area shall be completely dry, spray applied encapsulant shall be completely dry.

I. Clearance Criteria: All samples will have a concentration of airborne fibers at or below 0.01 fibers/cc by Phase Contrast Microscopy (PCM). If the final clearance samples do not meet the minimum clearance requirements, re-cleaning and re-sampling must be accomplished. The Abatement Contractor shall pay for the additional cost of re-sampling and re-analysis. The method of sampling and analysis will be the same as that used for the first set of samples.

1.2 CERTIFICATION OF VISUAL INSPECTION

A. The following Certification of Visual Inspection shall be completed by the Contractor and Project Monitor following completion of removal work, cleanup, and his/her visual inspection of the work area. The Certification of Visual Inspection shall be provided to the Owner upon completion of the job.
CERTIFICATION OF VISUAL INSPECTION

Building: ________________________________________________________________

Project Number: __________________________________________________________

Specific Area: ____________________________________________________________

In accordance with Section 13280 - Asbestos Abatement, the Contractor hereby certifies that he has visually inspected the work area (all surfaces including pipes, beams, ledges, walls, ceiling and floor, decontamination unit, sheet plastic, etc.) and has found no dust, debris, or residue.

By: (Signature) ___________________ Date: ___________________

(Print Name): ___________________ Title: ___________________

Company Name: __________________________________________________________

ABATEMENT PROJECT MONITOR’S CERTIFICATION

The Abatement Project Monitor hereby certifies that he has accompanied the Contractor on his visual inspection and verifies that this inspection has been thorough and to the best of his knowledge and belief, the Contractor's certification above is a true and honest one.

The final air sampling has been completed and the sample results are in accordance with the Contract Documents. The final air samples were analyzed by: PCM or TEM.

Clearance air sample numbers are: __________________________________________

By: (Signature) ___________________ Date: ___________________

(Print Name) ___________________ Title: ___________________

Final Air Clearance Passed the Clearance Criteria of (<0.01 f/cc) by PCM Analysis:
Final Air Clearance Passed the Clear. Criteria of (<70 structures/mm²) by TEM Analysis:
Final Air Clearance Failed the Clearance Criteria of (>0.01 f/cc) by PCM Analysis:
Final Air Clearance Failed the Clear. Criteria of (>70 structures/mm²) by TEM Analysis:

END OF SECTION 13281
APPENDIX A

ASBESTOS ABATEMENT
SPECIFICATION DRAWINGS
ASBESTOS ABATEMENT GENERAL NOTES:

1. An asbestos inspection was performed by France Environmental, Inc. (FEI) and asbestos-containing materials (ACM) were generally found in the areas indicated. The asbestos survey/inspection report is available to the contractor(s) for their information. The asbestos-containing materials shall be removed prior to any other work being performed in the areas.

2. No asbestos-containing replacement materials shall be used on this project.

3. Locations of ACM which will be shown on this drawing are approximate. Contractor(s) shall verify all dimensions and field conditions prior to submitting their bid proposal.

4. Coordinate all work with the general contractor.

5. All work shall be performed in accordance with the project specifications. All asbestos activities are to be performed by qualified personnel licensed by the Commonwealth of Virginia.

ASBESTOS ABATEMENT SPECIFIC NOTES:

- Remove and dispose of asbestos-containing brown/black mastic associated with green 12"x12" vinyl floor tile (exposed).
- Remove and dispose of asbestos-containing black mastic associated with red 12"x12" vinyl floor tile (under carpet).
- Remove and dispose of asbestos-containing beige 12"x12" vinyl floor tile with black mastic (exposed).
- Remove and dispose of asbestos-containing brown/black mastic associated with green 12"x12" vinyl floor tile (under carpet).
- Remove and dispose of asbestos-containing beige 12"x12" vinyl floor tile with black mastic (under carpet).
- Remove and dispose of asbestos-containing beige 12"x12" vinyl floor tile with black mastic (second layer).
- Remove and dispose of asbestos-containing gold/black carpet glue/mastic (typical throughout carpeted areas).
- Remove and dispose of asbestos-containing black mastic associated with white floor leveling compound (typical throughout carpeted areas).
- Remove "intact" and dispose of presumed asbestos-containing materials (PACM's) associated with the vault system, i.e. door, walls, etc.