

**REMEDIAL DESIGN AND ASBESTOS ABATEMENT WORK PLAN
TOTAL BUILDING RENOVATION**

TRACKING NUMBER: 13856

THOMSON ELEMENTARY SCHOOL
1200 L STREET, NW
WASHINGTON, DC

OCTOBER 14, 2002

PART 2 OF 2

PREPARED FOR:

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SIGNATURE PAGE

The following asbestos abatement design was prepared and reviewed by the following personnel.

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1.0 DEFINITIONS

Abatement – Procedures to control fiber release from asbestos-containing materials. Includes removal and encapsulation of asbestos-containing materials.

ACGIH – American Conference of Government Industrial Hygienist – 6500 Glenway Avenue, Building D-5 – Cincinnati, Ohio 45211

AHERA – Asbestos Hazard Emergency Response Act (40 CFR 763).

AIHA – American Industrial Hygiene Association – 2700 Prosperity Avenue, Suite 250, Fairfax, VA 22031

Airlock – A system for permitting ingress and egress with minimum air movement between a contaminated area and an uncontaminated area, typically consisting of two curtained doorways separated by a distance of at least 3 feet such that one passes through one doorway into the airlock, allowing the doorway sheeting to overlap and close off the opening before proceeding through the second doorway, thereby preventing flow-through contamination. Two overlapping polyethylene sheets will protect each doorway.

Air monitoring – The process of measuring the fiber content of a known volume of air collected during a specified period of time. The procedure normally utilized for asbestos follows the NIOSH Method 7400 Standard Analytical Method for Asbestos in Air. Where applicable, electron microscopy methods may be utilized for air clearance monitoring.

Air Sampling Professional (or on site air monitor) – The professional contracted to provide job oversight; enforcement of this specification and to conduct area and clearance air monitoring. This individual will be either a Certified Industrial Hygienist or have extensive experience in asbestos air sampling and abatement oversight. At a minimum, this individual should have successfully completed an EPA approved asbestos abatement air monitoring/project-monitoring course. This person shall have the authority to resolve inconsistencies in the specifications.

Amended Water – Water to which a surfactant has been added.

ANSI – American National Standards Institute – 1430 Broadway, New York, NY 10018

Asbestos means the asbestiform varieties of serpentine (chrysotile), riebeckite (crocidolite), cummingtonite – grunerite (amosite), anthophyllite, and actinolite, and tremolite.

Asbestos Containing Material (ACM) – Any material that contains more than 1% asbestos by volume.

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

ASTM – American Society for Testing and Material – 1916 Race Street, Philadelphia, PA 19103

Authorized visitor – Any representative of a regulatory or other agency representative having jurisdiction over the project.

Certified Industrial Hygienist (CIH) – An industrial hygienist certified in Comprehensive Practice by the American Board of Industrial Hygiene. (See AIHA definition for address)

Clean room – An uncontaminated area or room that is part of the worker decontamination enclosure system with provisions for storage of worker’s street clothes and clean protective equipment.

Curtained doorway – A device to allow ingress or egress from one room to another while permitting minimal air movement between the rooms, typically constructed by placing two overlapping sheets of plastic over an existing or temporary 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. Other effective designs are permissible.

Decontamination enclosure system (decon) – A series of connected rooms, separated from the work area from each other by air locks, for the decontamination of workers equipment.

Demolition – The wrecking or taking out of any load-supporting structural member of a facility and any relating razing, removing, or stripping of asbestos product.

Encapsulant – A liquid material which can be applied to asbestos containing material and/or abated facility component which controls the possible release of asbestos fibers from the material either by creating a membrane over the surface (bridging encapsulant) or by penetrating into the material and binding its components together (penetrating encapsulant).

Encapsulation – The application of an encapsulant to asbestos containing materials and/or abated facility component to control the release of asbestos fibers into the air.

Enclosure (containment) – The construction of an airtight, impermeable, temporary barrier around asbestos-containing material to control the release of asbestos fibers into the air.

EPA – U.S. Environmental Protection Agency – 401 M Street, SW, Washington, DC 20460

Equipment decontamination enclosure system – That portion of a decontamination enclosure system designed for controlled transfer of materials and equipment into or out of the work area.

Equipment room – A contaminated area or room that is part of the worker decontamination enclosure system with provisions for storage of contaminated clothing and equipment.

Facility component – Any pipe, duct, boiler, tank, reactor, turbine at or in a facility or any structural member of a facility.

Fixed object – A piece of equipment or furniture in the work are which cannot be removed for the work area.

Friable asbestos material – Any asbestos containing material that, when dry, can be crumbled, pulverized, or reduced to a powder, by hand pressure, including an ACM that will or can reasonably be expected to become friable as a result of the asbestos abatement activity.

HVAC – Heating, ventilation and air conditioning system.

HEPA filter – A high efficiency particulate air filter capable of removing particles greater than 0.3 microns in diameter with 99.97% efficiency.

HEPA vacuum – A vacuum system equipped with HEPA filtration.

Holding area – A chamber in the equipment decontamination enclosure located between the washroom and an uncontaminated area. The holding area comprises an airlock.

MSDS- Material Safety Data Sheet

Movable object – A piece of equipment or furniture in the work area that can be removed from the work area.

NESHAPS – The National Emission Standards for Hazardous Air Pollutants (40 CFR Part 61).

NIOSH – The National Institute of Occupational Safety and Health, CDC – NIOSH, Building J N.E. Room 3007, Atlanta, GA 30333

NIOSH 7400 Method – Asbestos Air Sampling Methodology performed by Phase Contract Microscopy

OSHA – The Occupational Safety and Health Administration, 200 Constitution Avenue, Washington, DC 20210

Outside air – The air outside buildings and structures (ambient air)

Plasticize (poly) – To cover floors and walls with plastic sheeting as herein specified (6 mil).

Prior experience – Experience required of the contractor on asbestos projects of similar nature and scope of the USACE job. This is to ensure capability of performing the asbestos abatement in a satisfactory manner. Similarities addressed shall be in areas related to material composition, project size, abatement methods required, number of employees and the engineering, work practice and personal protection controls required.

Removal – The striping of any asbestos containing materials from surfaces or components of a facility.

Shower room – A room between the clean room and the equipment room in the worker decontamination enclosure with hot and cold or warm running (water controllable at the tap) and suitably arranged for complete showering during decontamination.

Splashguard – A protective wall barrier consisting of 6-mil polyethylene sheeting that extends upward from the floor 48 inches.

Staging area – Either the holding area or some area near the waste transfer airlock where containerized asbestos waste has been placed prior to removal from the work area.

Structural member – Any load-supporting member of a facility, such as beams and load-supporting walls or any non-load-supporting member, such as ceilings and non-load-supporting walls.

Surfactant – A chemical wetting agent added to water to improve penetration.

USACE – US Army Corps of Engineers

Visible emission – Any emission, containing particulate asbestos material that is visually detectable without the aid of instruments. This does not include condensed uncombined water vapor.

Waste transfer airlock – A dual chamber decontamination system utilized for transferring containerized waste from inside to outside of the work area.

Wet cleaning – The process of eliminating asbestos contamination from building surfaces and objects by using cloths, mops, or other cleaning utensils which have been dampened with water and afterwards thoroughly decontaminated or disposed of as asbestos contaminated waste.

Work area – Designated rooms, spaces, or areas of the project in which asbestos abatement actions are to be undertaken or which may become contaminated as a result of such abatement actions. A contained work area is a work area that has been sealed, plasticized, and equipped with negative air units and a decontamination enclosure system. A non-contained work area is an isolated or controlled-access work area that has not been plasticized nor equipped with a decontamination enclosure system.

2.0 SCOPE OF WORK

The work specified herein shall be the removal of asbestos-containing materials (ACM) by a competent person who is trained, knowledgeable and qualified/accredited in the techniques of abatement, handling and disposal of asbestos-contaminated materials. Subsequent cleaning of contaminated areas will comply with all applicable federal/local regulations, and this Work Plan.

The Contractor shall supply all labor, materials, services, insurance, permits and equipment necessary to carry out the work in accordance with all applicable federal, state and local regulations and these specifications.

The Contractor shall also supply an Abatement Close-out Report. The report submittal shall consist of two copies of a final Close-out Report (one bound copy and one unbound, reproducible copy) to USACE, DC Schools Project Manager with 30 days of project completion. The final Close-out Report must include a title page containing the site name, project name (what was removed and from where), dates of service covered in the report and a list of appendices. The title page must be followed by a minimum of four appendices, in the following order: 1) EPA or Courtesy Notification, 2) Supervisor training records, medical clearance, and fit testing documentation, 3) Worker training records, medical clearance, and fit testing documentation, and 4) Waste Manifest.

The scope of work for this project includes the following ACM removal and associated activities at Thomson Elementary School:

Asbestos containing light-weight leveling compound (LWC) is present under the finished floor throughout the third floor of the building. This material will be impacted during the renovation process.

Complete Removal:

Approximately 8,000 square feet of LWC throughout the entire third with the exception of the bathrooms and the stair treads leading to the second floor.

3.0 WORK SCHEDULE

Work must be completed so that final air samples (by AHERA aggressive TEM) are below 70 structures per square millimeter. The Abatement Contractor is required to attend a Pre-Construction Meeting to be scheduled by the Contractor. This meeting will occur prior to the start of abatement activities.

3.1 Applicable Standards and Guidelines

3.1.1 General Requirements

The most recent editions of all Federal, State, and Local relevant regulations, standards, documents or codes shall be in effect. When conflict exists among the requirements or with these specifications, the most stringent requirements shall be utilized.

Work shall begin as soon as practical after the award of the contract and receipt of the necessary permits by the Contractor. The Contractor is expected to follow all health and safety procedures applicable to the work. The Abatement Supervisor shall speak shall be able to communicate effectively with all employees and ensure that the employees understand the information provided.

3.1.2 Specific Requirements

The Contractor shall follow the appropriate regulations included in the following:

- Occupational Safety and Health Administration (OSHA)
- Environmental Protection Agency (EPA)
- All District of Columbia Safety Codes, Labor Codes, rules and regulations, unless otherwise instructed by the USACE.
- Title 29 Code of Federal Regulations Section 1926.1101 - Construction Standard for Asbestos.
- Title 29 Code of Federal Regulations Section 1926.103 - Construction Industry Standard for Respiratory Protection (Final Rule)
- Title 29 Code of Federal Regulations Section 1926.33 - Access to Employee Exposure and Medical Records.
- Title 29 Code of Federal Regulations Section 1926.59- Hazard Communication.
- Title 40 Code of Federal Regulations Part 763 - Asbestos-Containing Materials in Schools; Final Rule and Notice
- Title 40 Code of Federal Regulations Part 61 Subparts A and M (Revised Subpart B)- National Emission Standard for Asbestos.
- Title 40 Code of Federal Regulations Part 763 – Subparts E & G – Asbestos containing materials in schools.
- Title 49 Code of Federal Regulations Part 171 and 172 – Hazardous Materials Transportation

In addition, as required by the USACE, the USACE-Baltimore District must receive a copy of the waste manifest for the asbestos waste disposal within 10 days of receipt at the Landfill.

4.0 SUBMITTALS AND NOTICES

The Contractor will:

- Submit written documentation of filter replacements for HEPA vacuums and negative pressure ventilation units, demonstrating that new filters have been installed prior to the start of work. Submit documentation of functioning status of negative pressure ventilation units and recorded actual CFM capability.
- Submit documentation of respirator fit testing of all Contractor employees and agents who must enter the work area. This fit testing shall be in accordance with qualitative procedures described in 29 CFR 1926.103. Qualitative fit testing in accordance with this standard is acceptable. This shall be done once a year.
- Submit copies of all training records/licenses and copies of medical records for those individuals working on this project.

- Notify the District of Columbia and the USEPA that they will be performing an asbestos abatement at the named facility.
- During abatement activities Contractor shall submit logs documenting workers entering and exiting containment area(s), filter changes on HEPA vacuums, negative pressure within containment, and other engineering controls. Also post Contractor's District of Columbia Certification.
- Submit written notification in accordance with 40 CFR Part 61.146 of Subpart M, to the appropriate State or Federal air pollution control agency responsible for the enforcement of the National Emissions Standard for Asbestos.

Prior to commencement of work:

- Notify site personnel of the arrangements. These arrangements must be made prior to start to avoid unauthorized access into the work area. (Note: Notification of all area occupants and users is required in order to prevent unnecessary or unauthorized access to the contaminated work area.)
- USACE will notify DCPS prior to work starting so DCPS can lock out/tag out electrical circuits within the air handling rooms.
- Provide the Contractor information concerning access, line and equipment clearing, and protection requirements of certain equipment and systems in the work area.
- Water and electricity will be available to the Contractor.

5.0 ASBESTOS WORK AREA SECURITY

Access to the work area is to be restricted to authorized, trained, and protected personnel only. These may include the contractor's employees, employees of subcontractors, DCPS and local inspectors and any other designated individuals. Entry into the work area by unauthorized individuals shall be reported immediately to the Contractor representative. Access to containment work areas shall be through a single worker decontamination system located at a designated area at the worksite. All other means of access shall be blocked so as to prevent entry to or exit from the work area. The only exceptions to this rule are: the waste pass-out airlock which shall be sealed except during the removal of contained asbestos waste from the work area, and emergency exits in case of fire or accident. Emergency exits shall be sealed with polyethylene sheeting and tape until needed. The Contractor should have control of site security during abatement operations, in order to protect work efforts and equipment. If a problem occurs, the Contractor will notify the USACE representatives immediately.

6.0 MATERIALS

6.1 General Materials

The Contractor will supply MSDS's on all encapsulant additives or other chemicals used in this abatement project, prior to bringing the material onto the site. Polyethylene sheeting for walls, stationary objects and Critical Barriers will be a minimum of 6-mil thick. The Contractor and the USACE Representative (s) will agree upon the method of attaching polyethylene sheeting in advance. The method of attachment may include any combination of duct tape or other waterproof tape, furring strips, staples, nails, screws or other effective procedures capable of sealing adjacent sheets of polyethylene and capable of sealing polyethylene to dissimilar finished or unfinished surfaces under both wet and dry conditions (including the use of amended water). Adhesives must be free of methylene chloride. Polyethylene sheeting utilized for worker decontamination enclosure will be clear in color, except showers and change rooms.

Disposal bags will be of 6-mil polyethylene, pre-printed with labels as required by EPA regulation 40 CFR 61.1529(b)(1)(iv).

If asbestos waste is stored on the site, it shall be stored in a fully enclosed, locking storage container such as a roll-off box.

Surfactant (wetting agent) will be a 50/50 mixture of polyoxyethylene ether and polyoxyethylene ester, or equivalent, mixed in a proportion of 1 fluid ounce to 5 gallons of water or as specified by manufacturer. (An equivalent surfactant will be understood to mean a material with a surface tension of 29 dynes/cm as tested in its properly mixed concentration, using ASTM method D1331-56- "Surface and Interfacial Tension of Solutions of Surface Active Agents".)

The USACE Representative will approve encapsulation materials. Encapsulants will not be solvent-based or utilize a vehicle (the liquid in which the solid parts of the encapsulant are suspended) consisting of hydrocarbons. Encapsulants will not be flammable. Encapsulant may be tinted to distinguish between the encapsulant and the surface to which it is being applied. The USACE Representative will approve chemical strippers. Strippers will not be flammable. MSDS's must be submitted prior to use.

6.2 General Equipment and Personal and Respiratory Protection

All equipment that arrives on the job site must be free of visible asbestos-containing debris or must be kept double-bagged until the containment has been completed, is under negative pressure, and the decontamination unit is in place.

Water will be available. Electricity will be available. The abatement contractor is responsible for providing electrical hook-up.

The contractor will provide NIOSH approved respiratory protection to all workers and all official representatives of the state or other governmental entity. As a minimum, the respiratory protection will include Half-face, air purifying respirators equipped with P-100 cartridges. Respirators will be in compliance with 29 CFR 1926(h) and appropriate for the level of fibers found in the Work Area as required by 29 CFR 1926(h)(3). *Single use, disposable and quarter-face respirators will not be allowed during the removal for any reason.*

All respiratory protection will be provided to workers in accordance with the Contractor's written respiratory protection program, which shall be prepared in accordance with 29 CFR 1926.103 [OSHA 29 CFR 1910, 134(b)(1-11) by reference]. This program will be posted in the clean room of the worker decontamination enclosure system.

Workers will be provided with personally issued, individually identified (marked with waterproof designations) respirators.

No one wearing facial hair that interferes with the face to face-piece seal will be permitted to don a respirator and enter the work area.

Additional respirators (minimum of 2 of each type) and training on proper donning and use must be available at the work site for authorized visitors who may be required to enter the work area. Also, half-face respirators must be available, for possible use during preparation of the Work Area.

If half-face respirators are to be used during preparation of the Work Area, the Contractor must supply a sufficient quantity of NIOSH approved HEPA type P100 filters so that the workers may change filters at the end each shift. Respirators must be washed each time a worker leaves the Work Area. Store

respirators and filters at the job site in the clean room or other clean area and protect from exposure to asbestos prior to their reuse.

Full-body disposable protective clothing, including head, body and foot coverings (unless using footwear as described below) consisting of material impenetrable by asbestos fibers (tyvek or equivalent) will be provided to all workers and authorized visitors in sizes adequate to accommodate movement without tearing.

Additional safety equipment (e.g., hard hats meeting the requirements of ANSI Standard Z89.1-1981, eye protection meeting the requirements of ANSI standard Z87.1-1979, disposable PVC gloves), as necessary, will be provided by the Contractor to all workers and authorized visitors.

Disposable clothing shall be adequately sealed to footwear to prevent body contamination. If launder able clothing is to be worn underneath disposable protective clothing, it will meet or be in accordance with 29 CFR 1926.1101

The Abatement Contractor must provide a sufficient supply of disposable mops, rags, and sponges for work area decontamination.

During removal, the Contractor is responsible for providing and properly using the following:

- Ground-Fault Circuit Interrupters (GFCI).
- A manometer, with a paper printout, to ensure that negative pressure is maintained at or above 0.02 inches of water. Recording of containment pressure should occur in a minimum of every 10 minutes and during all items of loss pressure.
- A sufficient supply of ladders, lifts and hand tools (e.g. scrapers, wire cutters, brushes, utility knives, wire saws, etc.). Scaffolds and fall protection procedures will follow all Federal, State and Local regulations. Proof of Fall Protection Training is required.
- Sprayers with pumps capable of providing 20 pounds per square inch (psi) at the nozzle tip and flow rate of 2 gallons per minute for spraying amended water.
- Rubber dustpans and rubber squeegees for cleanup.
- Brushes utilized for removing loose asbestos-containing material may have nylon fiber or metal bristles.
- HEPA filtered vacuum systems must be provided by the Abatement Contractor during cleanup.
- Airless spray equipment for applying encapsulants. Nozzle pressure should be adjustable within the 400 to 1500-psi ranges. (This would be based on the encapsulant's viscosity and solids content. Tip size will also be specified based on manufacturer's recommendations) Encapsulant will be applied to all abated surfaces and facility components.

7.0 REMOVAL PROCEDURES AND DETAILED SPECIFICATION

The dimensions, estimated quantities of ACM and other specifics are as follows:

Complete Removal:

Approximately 8,000 square feet of LWC throughout the entire third with the exception of the bathrooms and the stair treads leading to the second floor.

General Information

1. In the corridor, there is a layer of ½” thick resilient material that covers the LWC. This material is also asbestos containing. The depth of the LWC is approximately 2” to 3”.

2. In the classrooms, coatrooms and storage closets there is a combination of carpet, vinyl composition floor tiles, plywood, and 3/4" thick tongue & groove wood flooring that covers the LWC. The depth of the LWC is approximately 2" to 3".

The following specific requirements apply to the work to be completed by the Contractor:

- Site preparation will consist of constructing of a negative pressure enclosure encompassing the work area. Critical barriers will be constructed of 2 layers of 6-mil poly and placed on walls, windows, lights, HVAC discharge or intake openings, structural penetrations, and porous surfaces. Additional isolation and the installation of negative air machines on the second floor may be required to prevent fiber migration. Such isolation should leave the stairwells open for traffic to all floors.
 - **No work activities shall be performed on the second floor below directly below areas of abatement on the third floor without expressed and documented permission of the on-site industrial hygienist because of the potential for fiber release from the third floor.**
 - **The contractor shall consult with a structural engineer to determine if abatement activities will compromise the structural integrity of the third floor - floor system. A test core (from third through to second floor) is recommended to determine the composition of the third floor slab.**
- The wood tongue & groove flooring shall be removed, cut-up, containerized, labeled and disposed of as contaminated waste.
- The top layer throughout the corridors shall be removed along with the LWC and disposed of as asbestos containing.
- The LWC will be removed utilizing deck scrapers and other approved mechanical means down to the structural support layer. A scarifying (blast track or similar) machine shall be used to ensure that all residual LWC is removed.
 - Demolition of approximately 6"-8" of vertical walls will be required in some areas. These walls will be left in place following demolition by the general contractor and shall be demolished down to the structural floor level.
- Fine cleaning will be performed utilizing HEPA vacuums and proper wet wiping techniques.
- The Contractor and On-site Industrial Hygienist will perform a visual inspection of the area after the fine cleaning process.
 - The on-site Industrial Hygienist shall collect bulk samples of the structural floor layer to determine the effectiveness of the removal procedures. A minimum of nine bulk samples shall be collected throughout. These samples shall be collected and test < 1% asbestos by weight before applying the lock-down encapsulant. Re-cleaning and re-sampling will be performed until bulk samples pass this clearance criteria.
- The collection and analysis of final clearance air samples are described in Section 8.2
- When the final air clearance criteria have been met the containment areas may be demobilized.

Removal methods must comply with all applicable Federal, State and Local Regulations. Removal of the various asbestos-containing and/or asbestos-contaminated materials will be performed in accordance with the procedures listed below:

7.1 Preparation

In the work areas, the contractor shall post caution signs meeting the specification of 29 CFR 1926.1101(k)(7)(ii) at all locations and approaches to locations where airborne concentrations of asbestos may exceed ambient background levels. Signs shall be posted at a distance far enough away from the work area to permit an employee to read the signs and take the necessary protective measures to avoid exposure. Additional signs may need to be posted following construction of workplace enclosure

barriers. Signs will be in both Spanish and English. Prior to preparation, all Facility HVAC units or fans associated with the work area must be shut-off, locked and tagged by the DCPS representative(s). The Contractor shall confirm that this has been completed before preparation.

7.2 Negative Air

The Contractor will have enough negative air units within the containment to successfully perform one complete air exchange every 10 minutes, as well as maintain a minimum -0.02 inches water gauge (W.G.) of negative pressure until the decontamination of the Work Area is complete. The negative air unit(s) will be strategically placed to provide air movement and filtration throughout the Work Area. All negative air exhaust tubing will exit outside the building. Exhausting of negative air units will not be allowed within the school. (The Contractor will have a spare unit within the containment in case of equipment failure).

Pre-filters on all operating negative air units will be replaced at the beginning and end of each shift. All negative air units brought on-site must have new intermediate filters prior to the beginning the abatement. Negative air unit HEPA filters must not have more than 1200 hours of operations. A new HEPA filter is required if filter operations exceed 1200 hours. A negative air unit Log Book must be kept on-site for each negative air unit.

The Contractor is responsible for determining the proper number of negative air units required for the containment in order to successfully achieve a minimum of one air change every 10 minutes. Dimensions and calculations will be delivered and approved by the Contractor, prior to abatement. This must be done by determining the volume of the Work Area in cubic feet by multiplying the floor area (SF) by the floor to ceiling (deck) height. Determine the total ventilation requirement in cubic feet per minute (CFM) for the Work Area by dividing this volume by the air change rate (10 minutes). Increase the result by 25% to compensate for vertical shafts, etc. Determine the number of negative air machines needed to achieve a 10-minute change rate by dividing the ventilation requirement (CFM) by the capacity of exhaust units used. The capacity of a unit for purposes of this scope will be the capacity in cubic feet per minute with fully loaded filters, roughly 75% of the units rated CFM.

Where required for proper airflow, provide openings in the perimeter enclosures that allow air from outside into the Work Area. Locate make-up air inlets as far as possible from the exhaust units. Either install HEPA-filtered make-up air inlets at openings or cover openings with flaps designed to reseal automatically if the negative pressure system should shut down for any reason. Owner's Representative must approve locations and design of make-up air inlets.

7.3 Decontamination Unit

Required decontamination areas comprising the decontamination unit and their usage shall be as follows:

Clean Room: In this room persons remove and leave all street clothes and put on clean disposable coveralls. Approved respiratory protection equipment is stored in this area. The floor of the clean room must be kept dry at all times. At the end of each shift, the room must be cleaned using wet rags. No asbestos-containing materials are allowed in this room. **THIS IS NOT A CONTAMINATED AREA.**

Shower Room: Provide a completely watertight, operational shower to be used by cleanly dressed workers headed for the work area from the clean room, or for showering workers heading out of the work area from undressing in the equipment room. Shower must be constructed so that water leakage is minimized. Any leaking water must be cleaned immediately. Showers must be equipped with hot and cold running water, soap and sufficient disposable towels for the number of workers at the site. Arrange water shut off and drain pump operation controls so that a single individual can

shower with out assistance from either inside or outside the work area. **THIS IS A CONTAMINATED AREA.**

Decontamination water is to be filtered through a 5-micron filter and discharged into a sanitary drain. Change filters at a minimum of once a day. Locate filters inside the shower unit so that the shower pan catches the water loss during the filter change. Filters and water will be disposed of as ACM waste.

Equipment Room: This is an area where workers coming out of or from a work area can undress out of PPE before proceeding into the clean room. This room is not intended for storage of asbestos contaminated materials and should be kept clean at all times. This room is to be cleaned at the end of each shift and when dirty using wet methods. **THIS IS A CONTAMINATED AREA.**

The contractor will control access to the work site by maintaining a daily log of personnel entering the work area, including abatement workers and their start/stop time. At no time should unauthorized personnel be allowed to enter the Work Area.

7.4 Workplace Entry and Exit Procedures

All workers and authorized personnel will enter the work area through the worker decontamination enclosure system in full containment procedures. All personnel, before entering the work area, will read and be familiar with all posted regulations, personal protection requirements (including workplace entry and exit procedures) and emergency procedures. A sign-off sheet will be used to acknowledge that these have been reviewed and understood by all personnel prior to entry.

Reusable, footwear will be stored in the equipment room. Upon completion of abatement, it will be disposed of as asbestos contaminated waste. (Rubber boots may be decontaminated at the completion of the abatement for reuse.)

These procedures shall be posted in the work area.

7.5 Waste container pass-out procedures

Asbestos-contaminated waste that has been containerized and/or 6-mil bagged shall be transported out of the work area through the load-out section of the decontamination unit. Waste containers will be properly labeled (bags, drums, or wrapped components) and cleaned using HEPA vacuums and wet wiping techniques and transported out of the work area. Waste pass-out will not take place during school hours.

7.6 Training

Prior to commencement of abatement activities, all personnel who will be required to enter the work area or handle containerized asbestos-containing materials must have received adequate training in accordance with this document and applicable regulations. This training will include the EPA AHERA Asbestos Abatement Worker and/or Abatement Supervisor's Licenses/Accreditation. These individuals must have a District of Columbia Asbestos Abatement Photo Identification License with them at all times. These licenses will be collected daily from the Air Monitoring Representative or the Contractor on-site personnel. Copies of all training documents must be submitted to the contractor prior to the start of the project. Training in emergency response and evacuation procedures shall be provided. The Contractor's Supervisor and the Contractor's Health and Safety Officer will conduct safety meetings with abatement workers, prior to each shift.

7.7 Clean-Up Procedure

Remove and containerize, all visible accumulations of ACM and asbestos contaminated debris utilizing rubber dustpans and rubber squeegees. Decontaminate all tools and equipment and remove at the appropriate time in the cleaning sequence. When gross removal and fine cleaning is completed, the Contractor will notify the air-monitoring firm that a final visual inspection (pre-sealant inspection) is requested. The air monitoring technician and the contractor Quality Control Representative will inspect the work area(s) to ensure that all visible ACM and debris have been removed. Once the visual inspection is completed, approval will be given to begin encapsulation (lock-down paint). Once the encapsulant paint has dried, final clearance air samples will be collected. Following the satisfactory completion of clearance air monitoring, remaining barriers may be removed and properly disposed.

7.8 Disposal Procedures

To prevent exceeding available storage capacity on site, sealed and labeled containers of asbestos containing waste shall be removed as the work progresses and transported to an approved asbestos staging area. Cross-contaminated components will also be treated as asbestos-containing materials. All asbestos-containing waste must be kept adequately wet in accordance with 40 CFR 61-SUBPART M. The waste material will be double-bagged in labeled 6-mil polyethylene bags and placed in a dumpster lined with two-layers of 6-mil polyethylene sheeting. The interior of the container shall be lined with two layers of 6-mil polyethylene sheeting on the walls and floor. The Contractor will be responsible for transporting and disposing of all asbestos containing waste at an approved landfill, following all regulations of transport. Asbestos warning signs will be posted on the exterior of all dumpsters. The dumpster must be lockable and locked at all times when not attended. The waste will be shipped and disposed in an EPA-approved landfill that accepts asbestos. The Contractor will provide a copy of the waste manifest to the USACE/Contractor within 10 days of receipt. The abatement contractor will sign the manifest on behalf of the building owner. The abatement contractor will strictly adhere to all applicable packaging, labeling and Department of Transportation hauling regulations and requirements.

8.0 AIR MONITORING AND QUALITY CONTROL

The purpose of air monitoring and quality control is to observe all asbestos-related work, interpret procedures and enforce all provisions of this specification pertaining to the removal of ACM. Stop work will occur if in the opinion of the Contractor and/or the USACE representatives that there is any nonconformance or substantial variations with these specifications, which has not been approved in writing by the USACE representatives. Work shall not resume until corrective measures have been carried out. An independent industrial hygienist-consulting firm will perform the air monitoring and abatement oversight. An "Industrial Hygienist" under the direction of a Certified Industrial Hygienist will be responsible for testing the integrity of the containment for tightness using smoke tube procedures prior to the removal of asbestos. The Industrial Hygienist or Air Monitoring Technician will have the authority to stop work immediately based on elevated fiber readings, breeches in the containment or unapproved work practices. The Industrial Hygienist must contact the Contractor and the Contracting Officer Representative should this occur. The Industrial Hygienist is also responsible for the collection of daily and final air samples, and determining if the area(s) can be reoccupied. The Contractor will incur all cost associated with re-cleaning the area in the event that the final air samples do not meet AHERA clearance criteria. Nothing in this work plan will be inferred to transfer the Contractor's responsibility for a thorough and safe job to the contractor or the USACE. The Air Monitoring Contractor, who is hired by the abatement contractor, will conduct air monitoring throughout the project. The Air Monitoring Contractor will report directly to the contractor. The Asbestos Abatement Contractor will cooperate fully with all aspects of air monitoring and quality assurance inspection operations.

8.1 During Removal

During removal, a minimum of 3 samples shall be taken per shift outside each work area. One of these daily samples shall be taken at the negative air exhaust. Additional sampling may be performed at the discretion of the Contractor, the Air Monitoring Contractor, and the USACE. All sampling will be performed by Phase Contrast Microscopy (PCM) in accordance with NIOSH Method 7400. If possible, samples will be located at the entrance of decontamination unit, near exhaust tubing and the perimeter of the work area. At least one daily air sample will be collected inside the containment. Turnaround time for PCM daily perimeter air samples will be 24 hours. Should daily perimeter air samples exceed the asbestos abatement clearance level of 0.01 f/cc by Phase Contrast Microscopy (PCM), work will stop and engineering controls (e.g., increase use of amended water, increase negative air, etc. will be re-evaluated. Samples that exceed the abatement clearance level of 0.01 f/cc by PCM will be re-analyzed by TEM. Should TEM samples exceed 0.01 asbestos fibers per cubic centimeter, then all work will stop until the source of airborne asbestos fibers is determined. If the source is not determined, work will not begin until additional air samples are below 0.01 asbestos fibers per cubic centimeter. Should airborne fiber concentrations inside the work area exceed the half-face air purifying respirator protection factor of 10x of the OSHA PEL of 0.1 f/cc, then an increase in the level of protection will be considered. This decision to increase the level of protection will be made by the Contractor's Certified Industrial Hygienist (CIH) for this project.

8.2 Post Removal and Clearance Air Monitoring

Following the completion of clean-up operations, the Contractor shall notify the on-site air monitoring representative that work area(s) is/are ready for a final visual inspection. After visual inspection approval by the on site air monitor, the contractor will encapsulate the entire work area. Once encapsulant is dry, clearance air monitoring will be performed in the work area for airborne fiber concentrations. The air sampling shall be conducted using the appropriate number of sampling pumps calibrated at a flow rate of at least five and not more than ten liters per minute using collection media and procedures in accordance with AHERA 40 CFR 763 Appendix A.

Clearance Air Samples shall be analyzed by Transmission Electron Microscopy utilizing the AHERA method. An independent third party laboratory that is NVLAP accredited will analyze clearance air samples. Final clearance air sampling will be performed by aggressive methods. Fans or leaf-blowers will be used to mix the air during sampling and simulate activity within the containment while pumps are operating. In accordance with AHERA, five samples will be collected within the containment and five samples collected outside containment. Three field blanks will also be collected. One field blank will be temporarily opened within the equipment room and one field blank will be temporarily opened within the Clean Room of the decontamination unit. The final field blank (cassette) will not be opened. All samples at all locations shall indicate concentrations of airborne fibers less than 70 structures per square millimeter. If airborne fiber concentrations exceed 70 structures per square millimeter, then the average concentration of those re-occupancy samples will be calculated and must be less than 70 structures per square millimeter.

8.3 Asbestos Abatement Contractor OSHA Monitoring

The abatement contractor shall be responsible for performing daily OSHA air sampling.

9.0 RESTORATION

No restoration is necessary, complete renovation of building to be undertaken after abatement.

APPENDIX A

FIGURES

ASBESTOS ABATEMENT CONTAINMENT DETAILS

APPENDIX B

AHERA ASBESTOS ABATEMENT

PROJECT DESIGNER AND INSPECTOR CERTIFICATION

APPENDIX C

SUPPORTING ASSESSMENT DOCUMENTAION