

Attachment C

Section 132800 – Removal of Asbestos Materials

SECTION 132800 - REMOVAL OF ASBESTOS MATERIALS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. The work covered by this section includes the handling of materials containing asbestos which are encountered during removal and demolition operations and the incidental procedures and equipment required to protect workers and occupants of the building or area, or both, from contact with airborne asbestos fibers. The work also includes the disposal of the removed asbestos-containing materials (ACM).
- B. Provide all labor, materials, tools, equipment, and insurance as required to remove and dispose of asbestos as indicated on the contract drawings.

1.3 DEFINITIONS

- A. Amended Water: Water containing a wetting agent or surfactant. The wetting agent specified here is 50% polyoxyethylene ester and 50% polyoxyethylene ether in a concentration of one (1) ounce in five (5) gallons of water.
- B. Asbestos: The term "asbestos" includes chrysotile, amosite, crocidolite, tremolite, anthophyllite, and actinolite.
- C. Asbestos Control Area: An area where asbestos removal operations are performed which is isolated by physical barriers to prevent the spread of asbestos fibers.
- D. Asbestos Fibers: This expression refers to asbestos fibers having an aspect ratio of 3:1 and longer than five (5) micrometers.
- E. Area Monitoring: Sampling of asbestos fiber concentrations within the asbestos control area and outside the asbestos control area which is representative of the airborne concentrations of asbestos fibers which may reach the breathing zone.
- F. Asbestos Floor Covering Materials: Nonfriable resilient sheet vinyl, vinyl asbestos or asphalt tile and asbestos adhesive.
- G. Friable Asbestos Material: Material that contains more than one percent asbestos by weight and that can be crumbled, pulverized, or reduced to powder by hand pressure when dry.
- H. HEPA Filter Equipment: High-efficiency particulate air filtered vacuuming equipment with a filter system capable of collecting and retaining asbestos fibers. Filters shall be of 99.97 percent efficiency for retaining fibers of 0.3 microns or larger.

- I. Non-friable Asbestos Material: Material that contains asbestos in which the fibers have been locked in by a bonding agent, coating, binder, or other material so that the asbestos is well bound and will not release fibers in excess of background levels during any appropriate use, handling, storage, transportation, processing or disposal.
- J. Personal Monitoring: Sampling of asbestos fiber concentrations within the breathing zone of an employee.
- K. Small Scale Project: An asbestos removal project taking place in a particular room or space which does not require the removal of more than 20 linear feet of pipe insulation (on pipe diameters smaller than 6"), or 10 square feet of asbestos containing material (ACM) or ACM debris.
- L. Time-Weighted Average (TWA): The TWA is an 8-hour time-weighted average airborne concentration of fibers longer than five (5) micrometers, per cubic centimeter of air.

1.4 QUALIFICATIONS

- A. All asbestos removal work shall be done by a contractor licensed by the District of Columbia and regularly engaged in such work.

1.5 REFERENCES

- A. The publications listed below form a part of this specification. The Contractor shall comply with all the requirements of the latest edition of these regulations.
 - 1. Code of Federal Regulations (CFR) Publications:
 - a. 29 CFR, Part 1910.1001 & 1926.58, Asbestos
 - b. 29 CFR, Part 1910.134, Respiratory Protection
 - c. 29 CFR, Part 1910.145, Specifications for Accident Prevention Signs and Tags
 - d. 29 CFR, Part 1910.20 Sub-part C, General Safety and Health Provisions
 - e. 34 CFR Part 231, Appendix C, Procedures for Containing and Removing Building Materials Containing Asbestos
 - f. 40 CFR, Part 61 Sub-parts A and M, US Environmental Protection Agency National Emission Standards for Hazardous Air Pollutants.
 - g. 40 CFR, Part 763, EPA Asbestos
 - 2. American National Standards Institute (ANSI) Publication:
 - a. Z 9.2, Fundamentals Governing the Design and Operation of Local Exhaust Systems
 - 3. American Society for Testing and Materials (ASTM) Publication:
 - a. E 849, Safety and Health Requirements Relating to Occupational Exposure to Asbestos
 - 4. U.S. Environmental Protection Agency (EPA) Publications:
 - a. EPA 560/5-85-024, Guidance for Controlling Asbestos-Containing Materials in Buildings

5. State and Local Regulations:

- a. The Contractor Shall Comply with all District of Columbia requirements and Regulations.
- B. Acquisition of Publications: Referenced CFR publications may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

1.6 NOTIFICATIONS

- A. The Contractor shall provide appropriate written notification, including information on planned non-standard procedures, at least 20 calendar days prior to the start of removal.

1.7 SUBMITTALS

- A. The following shall be submitted in accordance with the requirements of Division 1 Section "Submittal Procedures" and as stated herein.

1. ASBESTOS ABATEMENT CONTRACTOR DATA

- a. Qualifications: Documentation of the successful completion of at least three jobs comparable in complexity and care required. References of at least three previous jobs must be supplied to the Contracting Officer along with air monitoring data demonstrating compliance with Maryland Department of the Environment regulations, EPA recommended asbestos air concentrations of 0.01 fiber per cubic centimeter outside the Asbestos Control Area during removal operations, and verification of final decontamination of the work site, with documentation substantiating such for the same three jobs noted above.
 - b. Contractor's Information (for Supervisory Personnel): List Supervisory Personnel: Name, title, length of service with company, specific training courses taken on occupational safety and health hazards associated with asbestos corrective actions. Information showing the supervisory official shall have a minimum of two years experience in the removal of asbestos materials.
 - c. Contractor's Information (for Asbestos Workers and Laborers): List names, length of service with the Contractor's company, specific training in occupational safety and health hazards associated with asbestos corrective action, and specific experience of all Contractor personnel who shall be working on this project. Minimum experience requirement per employee shall be one year (including training periods) in the removal of asbestos materials.
 - d. Contractor's Information (for Medical Requirements): The Contractor shall submit proof that all personnel participating in this program are in full compliance with medical surveillance provisions of OSHA.
 - e. Submit Manufacturer's data, Sample and Certification of Compliance for Fire Retardant Plastic used during containment.
 - f. Testing Laboratory: Submit the name, address, and telephone number of the testing laboratory selected for the analysis of the air monitoring samples.
2. ASBESTOS ABATEMENT PLAN: The Contractor shall submit, at least 5 working days prior to the anticipated start date, a job-specific asbestos abatement plan for review and approval by the Contracting Officer. The following information shall be included in the plan:

- a. Submit a copy of the current DC "License for Asbestos Removal/Encapsulation" issued to the Contractor.
- b. Submit name, address and telephone number of the industrial hygienist selected to direct monitoring, training and overall project work procedures. The industrial hygienist shall be certified by the American Board of Industrial Hygiene.
- c. Submit a detailed, job-specific description of the asbestos abatement procedures to be used.
- d. Submit detailed, job-specific drawing(s) showing the asbestos to be removed and the locations of barriers, decontamination chambers, marshalling areas, air samplers, negative air machines, etc.
- e. Submit identification of building services (e.g. steam, electrical, ventilation, plumbing) which need to be interrupted during the project.
- f. Submit the schedule for asbestos waste removal; identification of temporary storage location(s) and disposal site.

1.8 GENERAL REQUIREMENTS

- A. The regulations require wetting of the asbestos material before, during and after stripping to prevent dust emissions. The regulations use "stripping" to refer to taking asbestos off ceilings, walls, pipes and other surfaces; and "removal" to refer to taking stripped asbestos material out of the building for disposal. No dry "stripping/removal" shall be permitted.
- B. The Contractor shall have at all times at his/her office and in view at the job site, one current copy of the OSHA Regulations 1910.1001, Asbestos, and Environmental Protection Agency 40 CFR, Part 61, Sub-part M, National Emission Standard for Asbestos.
- C. The Contractor shall schedule with the Division of Safety Representative through the Project Officer, inspections of the asbestos containment prior to the start of the asbestos work, and following completion of the asbestos work but prior to the dismantling of the containment.
- D. The District of Columbia regulates work place practices and the airborne concentration levels to which asbestos workers can be exposed. The regulations apply to removal, encapsulation, and enclosure operations involving asbestos materials.
- E. The District of Columbia has established limits on the level of airborne asbestos to which a worker may be exposed on a daily basis. Over an eight-hour period, the average airborne asbestos concentration level (also known as the Time-Weighted Average) to which a worker may be exposed may not exceed 0.2 fibers longer than five (5) micrometers per cubic centimeter of air (0.2 f/cc). A downward revision of these levels has been proposed, and whatever levels are valid at the time the work is done shall be those that are applicable.
- F. The Contractor shall use air monitoring results from an approved Industrial Hygiene firm to determine whether airborne concentrations of asbestos exceed these exposure limits in the asbestos control area.

1.9 WORKER PROTECTION

- A. The Contractor shall provide NIOSH approved respirators for personnel entering the asbestos control area as specified herein.
- B. All personnel (workers and inspectors) shall wear a properly fitted respirator on their face in the Asbestos Control Area. A copy of respirator fit test procedures and the respiratory protection program shall be available for inspection at the job site.

- C. The Contractor shall have responsibility for enforcement and shall instruct and train all personnel in proper respirator use.
- D. The Contractor shall provide disposable protective clothing for all personnel entering the asbestos control area on this project. All workers shall wear disposable protective whole body clothing, head coverings, gloves and foot covers. Non-disposable footwear shall be left in the Asbestos Control Area at all times until decontamination at job completion. Workers' street clothes shall be separate and distinct from the clothes worn in the Asbestos Control Area. All clothes worn by the workers in the Asbestos Control Area shall be disposed of as contaminated waste in the prescribed manner upon completion of the work.
- E. Decontamination Facility: The Contractor shall provide a temporary unit with a separate decontamination locker room and a clean locker room for personnel required to wear whole body protective clothing. The decontamination facility outside of the Asbestos Control Area shall consist of a clean room, shower area, and equipment and personnel decontamination area.
- F. The Contractor shall ensure that all personnel entering the asbestos control area during active removal shall:
 - 1. Remove street clothes in the clean room and put on the disposable coveralls, head covers, footwear, and respirators before entering the asbestos control area.
 - 2. Remove the disposable coveralls, head covers, and footwear in the contaminated change/equipment room before leaving the asbestos control area. Still wearing the respirators, workers shall proceed to the showers and remove their respirators while showering with soap and water.
 - 3. Shower each time after leaving the contaminated area and before proceeding to the clean change room and donning street clothes. Showers shall have warm water, be totally self-contained, and waste water from showers shall be filtered through a filter with a minimum of a 5 micron pore size before being discharged to a sanitary sewer or shall be collected and packaged for disposal as asbestos-contaminated waste.
 - 4. Do not eat, drink, smoke, or chew gum or tobacco in the asbestos control area.

PART 2 - PRODUCTS

2.1 SHEET PLASTIC

- A. Polyethylene Sheeting Provide flame resistant polyethylene film that conforms to requirements set forth by the National Fire Protection Association Standard 241, "Safeguarding Construction Alteration and Demolition Operations."

2.2 LABELS AND SIGNS

- A. Provide labels printed in English. Provide label of a sufficient size to be clearly legible. Affix labels to asbestos materials, scrap, waste, debris, sealed impermeable bags, asbestos waste drums, and other asbestos-contaminated products.
- B. Asbestos Waste Drum Labels: Provide labels with the following legend:

**CAUTION
CONTAINS ASBESTOS
DISPOSE OF IN AN**

APPROVED LANDFILL ONLY

- C. Provide labels with the following legend:

**DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE HAZARD
BREATHING ASBESTOS DUST MAY CAUSE
SERIOUS BODILY HARM**

- D. Asbestos Control Area Signs: Provide signs with the following legend:

**DANGER
ASBESTOS
CANCER AND LUNG DISEASE HAZARD
AUTHORIZED PERSONNEL ONLY
RESPIRATORS AND PROTECTIVE CLOTHING
ARE REQUIRED IN THIS AREA**

PART 3 - EXECUTION

3.1 ASBESTOS CONTROL AREA PREPARATION

- A. The Contractor shall comply with the following requirements. These requirements are general and are not all inclusive. The Contractor shall comply, in addition, with all regulations of Federal, State and local regulatory agencies for asbestos, as identified or implied elsewhere within these specifications.
1. The Contractor shall set up a decontamination facility as previously specified.
 2. The Contractor shall isolate the asbestos control area for the duration of the work by completely sealing off all openings and fixtures in the Asbestos Control Area, including, but not limited to, heating, cooling, ventilation ducts, doorways, elevators and elevator shaft(s), corridors, windows, skylights, pipes, electrical conduits, waste lines, and lighting with a minimum of 2 layers of 6-mil fire retardant plastic sheeting taped securely in place. All overlaps shall be completely sealed using duct tape or other method/materials approved by the Project Officer. Provide rigid support, such as a wood frame, for plastic sheeting, where required, to assure that the barrier remains intact.
 3. The Contractor shall build double barriers of plastic sheeting to form an air lock at all entrances and exits to the asbestos control area, contaminated change/equipment room, shower and clean room areas so that the asbestos control area is always closed off by a minimum of one barrier when workers or inspectors enter or exit.
 4. All building surfaces (i.e., floor, walls, furnishings, equipment, etc.) in the Asbestos Control Area shall be covered with a minimum of 2 layers of 6 mil thick plastic taped securely in place. Sheeting shall overlap and be completely sealed with duct tape.
 5. Before any work begins, the Contractor shall clean all removable equipment, furnishings, fixtures, items, etc., with either amended water and/or with a High Efficiency Particulate (HEPA) filtered vacuum and make provisions for its removal from the space.
 6. The Contractor shall clean all non-removable equipment, fixtures, pipes, conduits, items, etc., with either amended water or a HEPA filtered vacuum prior to constructing containment barriers.
 7. The Contractor shall be responsible for removing all air conditioning, heating and ventilation equipment system filters serving the Asbestos Control Areas. The filters shall be placed in 6 mil sealable bags for disposal as asbestos containing material.

B. Signs and Labels:

1. Asbestos Control Area Signs: Provide and mount Asbestos Control Area signs at all approaches to asbestos control areas. Locate signs at such a distance that personnel may read the sign and take the necessary protective steps required before entering the area. Signs shall be in vertical format conforming to 29 CFR, Part 1910.145 (a)(4), minimum 20 by 14 inches and display the legend specified in Part 2 - Products.
2. Danger Labels: Provide and affix danger labels to all asbestos material, packaged wastes and other products contaminated with asbestos. Provide labels of sufficient size to be clearly legible, displaying the legend specified in Part 2- Products.

C. Local Exhaust System: Provide a local exhaust system in the asbestos control area in accordance with ANSI Z 9.2 which exhaust is equipped with absolute (HEPA) filters. Local exhaust equipment shall be sufficient to maintain a minimum pressure differential of minus 0.02 inches of water column relative to adjacent, unsealed areas. The local exhaust shall provide and maintain a minimum of four (4) air changes per hour in the Asbestos Control Area. The local exhaust shall be operated on a 24 hours a day basis. The direction of air flow shall be verified twice each work shift. In no case shall the building ventilation system be used as the local exhaust system for the asbestos control area. Filters on vacuums and exhaust equipment shall conform to ANSI Z 9.2. Verification of exhaust system operation shall be maintained by the Contractor and submitted to the Project Officer upon request. The industrial hygienist shall notify the Contractor and the Project Officer immediately of any variance in exhaust system operation which could result in a loss of the required negative pressure.

1. At his expense, the Contractor shall provide a manometer with a hard printout to document the pressure differential in all Asbestos Control Areas. The hard readout shall be provided continuously from the start of asbestos removal until passing final clearance results are obtained.
2. The Contractor shall establish and maintain proper ventilation throughout all portions of the Asbestos Control Area for the duration of the project. The Contractor shall indicate in his Asbestos Abatement Plan how proper ventilation will be provided throughout all portions of the Asbestos Control Area.
3. The Contractor shall be required to install a sound absorbing system over the HEPA filtered local exhaust systems to minimize the noise level for all Asbestos Control Areas adjacent to Patient Care Units. All costs associated with designing, constructing, and installing the sound absorbing system shall be the responsibility of the Contractor.
4. All HEPA filtered local exhaust units shall be vented to the outside of the building whenever possible. Should venting to the outside of the building not be possible, venting to a nearby stairway is permitted. If venting to a stairway is proposed, it shall be clearly delineated in the Asbestos Abatement Plan.
5. Asbestos abatement may be required on or near live medium and high pressure steam lines. The Contractor shall identify in his Asbestos Abatement Plan where he anticipates these conditions will occur. The Contractor shall identify what measures he will have in place to provide for the safety of his work crews and other affected NIH personnel or representatives when conducting abatement operations in these areas.

3.2 METHOD OF ASBESTOS REMOVAL

- A. The asbestos material shall be sprayed with amended water to enhance penetration. A fine spray of the amended water shall be applied to reduce fiber release preceding the removal of the asbestos material and as required, during such removal. The material shall be sufficiently saturated to prevent emission of airborne fibers in excess of the exposure limits to workers prescribed in the Maryland Department of the Environment regulations and/or other regulation cited elsewhere in these specifications.

- B. The Contractor shall use no fans or ventilation equipment within the Asbestos Control Area unless approved by the Project Officer. Only air filtered through a HEPA filtering system shall be considered for use.
- C. No accumulation of loose materials over a large area shall be allowed. The removed materials shall be packed while still wet into sealable plastic bags of 6 mil minimum thickness or into fiber or metal drums for transport. Bags and drums shall be sealed and marked with the asbestos danger label. The exterior surfaces of waste containers shall be thoroughly cleaned before leaving the asbestos control area.
- D. The Contractor shall clean all asbestos-containing material from all surfaces in the Asbestos Control Area with amended water. After this cleaning operation, the Contractor's industrial hygienist consultant shall perform a complete visual inspection. If the Asbestos Control Area has not been satisfactorily cleaned, the Contractor shall repeat the cleaning process until clearance is obtained.
- E. The Contractor's industrial hygiene consultant shall take air samples which must show an asbestos air concentrations below 0.01 f/cc before final acceptance of the Asbestos Control Area is granted. The Division of Safety representative may also take clearance air samples and in all cases will provide final approval for the removal of the plastic enclosure.
- F. If the air samples show elevated levels, the Contractor shall reclean all surfaces in the Asbestos Control Area until the asbestos air concentration is below 0.01 f/cc.
- G. After the Asbestos Control Area is found to be clean (both visually and by virtue of the air sampling results) and approval is given by the Contracting Officer and the Division of Safety representative, the Contractor shall then remove all remaining plastic sheeting, tape, and any other trash and debris, place in sealable bags (6 mil minimum) or place into metal or fiber drums and remove from the building, sealed and labeled as required.
- H. After completion of all of the above, the Contractor shall then return, replace, and reconnect all items or materials that have been removed, relocated, disconnected, for this project. Affected Asbestos Control Areas shall be restored to the same condition as when the work started.
- I. Storage: Asbestos to be picked up by the waste hauler shall be stored safely and securely, kept dry, and protected from potential damage to the containers.

3.3 DISPOSAL OF ASBESTOS MATERIAL

- A. The Contractor shall remove and transport all waste to an Environmental Protection Agency approved disposal site off of the NIH property. The Contractor shall submit copies of the NESHAD asbestos waste manifests to the Contracting Officer and Project Officer after completion of each project.
- B. No contaminated containers (even if clean on the outside and sealed) shall be left exposed, stored, etc., in any unsecured location either inside or outside/external to the asbestos control area and/or the building. At the direction of the Contracting Officer and Project Officer, the Contractor shall at any time be required to remove existing accumulated properly packaged contaminated material to the approved disposal site off the property.

3.4 SPECIAL REQUIREMENTS FOR SMALL SCALE PROJECTS

- A. Small scale projects shall be defined as asbestos removal projects which do not exceed 20 linear feet of pipe insulation (on pipe diameters smaller than 6"), or 10 square feet of asbestos containing material (ACM) or ACM debris.
- B. Negative pressure glove bags or mini-containments shall be used to control fibers during small scale asbestos removal projects.
- C. All small scale projects shall be scheduled during evening hours and weekends when the affected areas are unoccupied, unless otherwise authorized by the Contracting Officer.

3.5 SPECIAL REQUIREMENTS FOR THE REMOVAL AND DISPOSAL OF ASBESTOS FLOOR COVERING MATERIALS

A. Removing Vinyl Asbestos or Asphalt Tile:

1. Scraping:

- a. Tiles in areas exposed to heavy foot traffic will usually adhere the tightest. Therefore, select those areas exposed to the least amount of foot traffic for starting removal.
- b. Individual tiles should be removed as a complete unit in as large a piece as possible. Water, with a wetting agent (dishwashing detergent or commercially prepared surfactant) may be used to soak tiles loose.
- c. Continue loosening by prying tiles with a long-handled scraper and apply a mist of water as work progresses.
- d. A commercial electric powered scraper may also be used with the warning that such tools will generally "chip" or cause tiles to break into smaller pieces, thus increasing the potential for release of asbestos fibers. Wetting prior to and during operation is essential.
- e. Removed materials shall be placed in a heavy duty (6 mil) plastic bag for proper disposal.
- f. **DO NOT SAND ADHESIVE.** Adhesive shall be removed by wet scraping.

2. Heat Removal:

- a. Removal of a relatively small area may be undertaken using a portable source of heat, such as a heat gun or a commercial hand-held hot air blower.
- b. Apply the source of heat to the surface of the tile to soften the adhesive and permit easy removal of whole tiles. Caution should be used to avoid fire hazard or burns. The use of open flame (propane) torches is prohibited.
- c. Removed materials shall be placed in a heavy duty (6 mil) plastic bag for proper disposal.

3. Cold Removal:

- a. Dry ice may be used to free tiles from adhesive.
- b. Place dry ice on tiles or in an open wood frame. Placing an insulation material on the dry ice will direct the cold downward.
- c. As tiles loosen, push dry ice onto other areas and gently scrape tiles loose. Apply spray mist of water to prevent airborne fiber release.
- d. Proceed with removal and clean-up as recommended for scraping procedure.

B. Removing Resilient Sheet Vinyl: Sheet vinyl floor covering is installed in several ways; un-adhered or loose lay adhered or cemented and peripherally adhered.

1. Remove molding or binding strips from around walls and doorways.
2. Cut a strip, through the wear surface, the length of the room. Strips can be 12" to 18" in width.
3. Gently peel back the wear surface from the adhered layer, turn it over and roll face out into a tight roll. Tie or tape securely and place in a heavy duty (6 mil.) plastic bag for disposal.
4. As you proceed, do not walk on exposed surface.
5. Vacuum the exposed surface, taking care not to allow exhaust air to blow over exposed felt.
6. Dispose of vacuum bag(s) in plastic waste bag. **DO NOT DRY SWEEP.**
7. The remaining felt layer may be removed by wet scraping. Moisten or dampen the felt by applying a solution of water mixed with a wetting agent (dishwashing detergent or a commercially prepared surfactant). Allow wetting agent to soak into material before scraping. Re-moisten as required.
8. Most felt back sheet flooring can be separated from the backing or felt layer, and it is possible to only partially remove the wear surface. The felt left on the floor may be smooth enough to follow the manufacturer's instructions for installing a new floor.
9. **CAUTION: DO NOT SAND OR DRY SCRAPE. ALSO, EXCESSIVE USE OF WATER CAN DAMAGE WOOD UNDER-LAYMENT. DO NOT FLOOD AREA OF UPPER FLOORS.**

C. Tools

1. The following tools and supplies will be helpful in the proper removal, clean-up and disposal of resilient floor coverings.
2. Broad, Stiff-bladed hand held scraper or floor scraper.
3. Utility knife.
4. Hand held hot air blower or heat gun.
5. Hand sprayer or sprinkling can.
6. Liquid dishwashing detergent, mixed with water to make wetting solution, or commercially prepared surfactant.
7. Tank size heavy duty (6 mil.) impermeable plastic bags or impermeable containers. Ties, tapes or string to seal bags.
8. Danger labels for bags as herein specified.

D. Disposal

1. It is important that proper disposal procedures be utilized during removal, regardless of the method. Extreme care should be taken. As dry removal or dust is encountered, workers should be provided with proper respiratory protection.
2. All removed materials shall be placed in heavy duty (6 mil.) plastic bags or impermeable type containers.
3. Exposed floor area shall be HEPA vacuumed and/or wet mopped. Dry sweeping is not permitted.
4. Vacuum cleaner bags shall be removed with care and placed in plastic bags or containers for disposal.
5. All trash containers shall be tightly sealed and labeled as specified in Part 2 - Products.

3.6 AIR MONITORING

- A. Air Sampling Method: Air sampling shall be under the direction of a certified industrial hygienist and shall be conducted according to the method prescribed by Section 1910.1001(f) of the OSHA regulations.
- B. Methods of Measurement: All determinations of airborne concentrations of asbestos fibers shall be made using NIOSH Analytical Method #239.
- C. Air Sampling Requirements: Prior to the start of any asbestos removal preparations, air sampling shall be performed to establish ambient (background) air levels in each Asbestos Control Area. To establish existing levels before asbestos removal, one air sample for each area shall be collected. Minimal air volume shall be 300 liters.
 - 1. Air monitoring shall be performed at the Asbestos Control Area to provide the following minimum samples during the period of asbestos removal:

Areas to be Sampled	Minimum No. Samples For Each Work Day	Minimum Volume Liters
Personal and Asbestos Control Area	3	Varies
Outside Asbestos Control Area Barrier	3	300

- 2. Results shall be reported by fax to the both the Project Officer and the Division of Safety Representative within 4 hours of completion of the sampling or before the next work shift when work involves occupied or unoccupied buildings.
- 3. The Contractor shall take personal samples as required by Maryland Department of the Environment and area samples at typical work sites in the removal operation to provide at least three samples from inside the barrier. Three area samples shall be taken outside the barrier area in locations approved by the Division of Safety Representative. Analytical results shall be reported as above. Continuation of the work shall be contingent upon approval of sample results.
- 4. Asbestos fiber counts in excess of 0.01 fibers/cc outside the Asbestos Control Area shall be cause for the Contractor to immediately and automatically stop all work and leave the negative air system in operation. Immediately report to the Project Officer.
- 5. Clearance sampling shall be accomplished after the removal and final cleaning operations are complete but before the barrier is removed. Sampling results shall not exceed 0.01 fiber/cc. The volume of the air sample shall not be less than 240 liters. Should the fiber count be greater than 0.01 f/cc, or greater than the pre-removal level, whichever is less, the Contractor shall reclean and the clearance sampling shall be repeated until an acceptable fiber level is obtained (0.01 fibers/cc or pre-removal level, whichever is less).

3.7 RESPIRATORS

- A. Select approved respirators from those listed by the National Institute of Occupational Safety and Health (NIOSH), Department of Health and Human Services.

- B. Respirators for Handling Asbestos: Provide personnel engaged in the removal of asbestos materials with Type C continuous flow or pressure-demand, supplied-air respirators. If the Contractor decides to provide respirators other than Type C continuous flow or pressure-demand, supplied-air respirators, the Contractor shall determine the exposure of each employee to airborne asbestos during each stage of the removal operation.

- C. Optional Respirators for Asbestos: Use Type C continuous flow or pressure-demand, supplied-air respirators until the Contractor establishes that the average airborne concentration of asbestos the employees shall confront shall not exceed 100 times the permissible exposure limits, i.e., 8-hour time-weighted average (TWA) and ceiling limit. When the exposures are established, the respirators presented in 29 CFR, Part 1910.1001 that afford adequate protection at such upper concentrations of airborne asbestos may be used.

END OF SECTION 13280