

SPRINGFIELD TOWNSHIP ELEMENTARY SCHOOL - ASBESTOS ABATEMENT

SECTION 1.0 - GENERAL REQUIREMENTS

- 1.1 The specification contained herein forms but a part of all sections and of the entire project specification. The Contractor shall become thoroughly familiar with all requirements and is bound by all terms and conditions contained in this specification.
- 1.2 This section specifies the requirements for removal of asbestos-containing and/or asbestos-contaminated materials from **Springfield Township Elementary School**. Asbestos removal is an environmental decontamination project, not a normal demolition project. Failure to execute this work in an effective manner can greatly increase the health hazard to building occupants, citizens of the community and the Contractor's staff. It is generally accepted that an improper removal job can create a worse hazard than taking no action at all.
- 1.3 Any plans, reports, written instructions, or verbal instructions are for reference purposes only. THE CONTRACTOR SHALL VERIFY FOR THEMSELVES THE TOTAL EXTENT OF THE PROJECT, INCLUDING FOOTAGES OF MATERIAL AND REMOVAL AREAS. It is the Contractor's responsibility to review the written specification in conjunction with any Contract Drawings. No subsequent extras, change orders, or compensation shall be provided due to failure of the Contractor to evaluate the total extent of the project or for errors or omissions in this specification.
- 1.4 Should the Contractor find any discrepancies in, or omissions from, any of the documents, or be in any doubt as to their meaning, he shall notify the Project Manager who shall issue all necessary clarifications by means of written correspondence or revised drawings. The Project Manager shall not be responsible for any oral instructions.
- 1.5 It is a procedural requirement that the Contractor maintain and require prime subcontractors to maintain complete current information on jurisdictional matters, regulatory actions and pending actions as applicable to the work, discuss new developments at appropriate project meetings at the earliest feasible dates, and record information of relevance along with the action agreed upon. The manner in which Contract Documents have been organized and subdivided is not intended to be an indication of jurisdictional or trade union agreements. It is the Contractor's responsibility to assign and/or subcontract the work and employ tradesmen and laborers in a manner which shall not unduly risk jurisdictional disputes of a kind which could result in conflicts, delays, claims, or losses in the performance of work.
- 1.6 The work of this contract can be summarized by references to the contract, including general conditions, supplementary conditions, specification sections, addenda and modifications to the contract documents issued subsequent to the initial printing of this project manual and including, but not limited to, printed material referenced by any of these. It is recognized that the work of the contract is also unavoidably affected or influenced by governing regulations, natural phenomena including weather conditions and other forces outside the contract documents.
- 1.7 The Building Owner and/or their representatives and consultants bear no responsibility in enforcing the provisions of any patents or licensing agreements regarding any methods, processes or products used in the course of this asbestos abatement project. It is the responsibility of the Contractor to ensure that they have all proper agreements in place regarding any patents or licensing agreements for the use of any methods, processes or products during this project.
- 1.8 The work practices contained in this specification shall serve as a guide in performing the work. No passages contained herein shall be construed as waiving or modifying any requirements of NJAC 5:23-8 (New Jersey Asbestos Hazard Abatement Subcode). The Contractor shall be expected to be familiar with all aspects of NJAC 5:23-8 and all work on this project shall be performed in accordance with the provisions of NJAC 5:23-8, where applicable.

SECTION 2.0 - SCOPE OF WORK

2.1 Springfield Township Elementary School

All work procedures, including final breakdown and cleanup, conducted at the Springfield Township Elementary School facility shall be conducted within the time frame(s) specified by the Owner. The Springfield Township Board of Education shall determine the sequence and scheduling for the work areas to coincide with the construction schedule. The work may be scheduled for after normal hours or on weekends.

- a. Prior to commencement of any work, the Contractor shall make a complete inspection all work areas and issue in writing a complete report of the existence of any damages to the OWNER or their representatives upon the date of the contract origin. The Contractor shall be held liable for rectifying all damages not contained in the initial report.
- b. Prior to any work, the Contractor shall ensure that the building owner has disabled the HVAC systems or any other systems bringing air into or out of the work area(s) by lockable switch, or other positive means that shall prevent

accidental restarting of equipment. All accessible air handling or ventilation equipment and fixtures shall be sealed with two (2) layers of six (6) mil polyethylene.

- c. As per any applicable contract drawings and as part of the abatement work, the Contractor shall repair and/or remove and dispose of as asbestos-containing materials the following:

SPRINGFIELD TOWNSHIP ELEMENTARY SCHOOL

1964 SECTION

Student Lavatories - Pipe Chase Area

All Asbestos-Containing Pipe Fitting Insulation (approx. 20 fittings)

Storage Room 07B

Asbestos-Containing Floor Tile and Mastic (approx. 80 square feet)

- d. Where designated by the OWNER or its representatives, the abatement of the asbestos-containing pipe fitting insulation found in the 1964 section shall be performed by removing the pipe fitting insulation from the pipe fitting using the limited containment glovebag procedures outlined here and in Section 18.0, under unoccupied building conditions, as follows:
1. The Contractor shall wet wipe or vacuum any debris or dust from moveable items and remove the items from the work area prior to commencing the abatement of any materials.
 2. All openings in the walls, ceilings and floors, including, but not limited to, doors, windows, ventilators, cracks, skylights, etc. inside the work area shall be sealed with a silicone caulk, fire-rated expanding foam or two (2) layers of six mil polyethylene. Two layers of polyethylene shall then be secured to the floor. Any airtight tents constructed in the work area shall be constructed of two (2) layers of six (6) mil polyethylene.
 3. The Contractor shall provide a proper number of air filtration and pressure monitoring devices, as determined by the Asbestos Safety Technician. Air filtration units shall be in operation at all times inside the work areas and exhausted outside the building. One air change shall be provided every fifteen (15) minutes. Pressure monitoring devices shall be installed at all decontamination units and waste removal chambers.
 4. Workers shall wear proper respiratory protection and disposable clothing at all times.
 5. The entrance to any work area shall be flapped with three (3) weighted, interlocking flaps constructed of six-mil polyethylene.
 6. Wherever a pipe or pipe fitting enters a barrier, wall, ceiling, joist or beam, the pipe or pipe fitting insulation shall be removed as far into the hole as possible. If needed, minor demolition of the wall, ceiling, joist or beam shall be performed in order to completely abate the insulation. Where needed, holes shall be filled with fire rated expanding foam or sealed with two (2) layers of six mil polyethylene. The foam shall be level with the surrounding surface. Extra foam shall be trimmed away.
 7. After the air filtration devices and floor coverings have been installed, but before the glovebags have been installed, the Contractor shall remove the existing ceiling tile. The tiles shall be wet wiped and/or HEPA-vacuumed and stored in an area outside the regulated work area. All fixtures, appurtenances and wire bundles shall be secured.
 8. All free-standing containment tents, barriers or tunnels shall be constructed of two (2) layers of six (6) mil polyethylene mounted on 2" x 4" studs placed 16" o.c. apart. Furring strips shall be used as needed.
 9. The Contractor shall apply sealant to all surfaces from which asbestos-containing material has been removed including, but not limited to, walls, floors, ceilings and polyethylene.
 10. No dry removal of friable asbestos-containing materials shall be permitted. At the conclusion of the abatement work, all surfaces in the work area shall be cleaned and all debris, plastic and tape residue shall be removed from the area.
 11. Electrical power and water for the work areas shall be drawn from the facilities outside of the work areas. Alternative sources of electrical power and water must be approved by the Asbestos Safety Control Monitor.

12. No changes shall be made to this scope of work or work practices without the approval of the Asbestos Safety Control Monitor.
- e. Where designated by the OWNER or its representatives, the removal of pipe fitting insulation found on piping that is no longer operational or will be removed as part of the HVAC upgrade project may be performed using the "wrap and cut" technique, as follows:
1. All openings in the walls, ceilings and floors, including, but not limited to, doors, windows, ventilators, cracks, skylights, etc. inside the work area shall be sealed with a silicone caulk, fire-rated expanding foam or two (2) layers of six mil polyethylene. One layer of six (6) mil polyethylene shall be secured to the floor beneath the area of pipe fitting insulation being removed.
 2. The Contractor shall wet wipe or vacuum any debris or dust from moveable items and remove the items from the work area prior to commencing the abatement of any materials.
 3. The Contractor shall provide a proper number of air filtration and pressure monitoring devices. Air filtration units shall be in operation at all times inside the work area and exhausted outside the building. One air change shall be provided every fifteen (15) minutes.
 4. Workers shall wear proper respiratory protection and disposable clothing at all times.
 5. The entrance to any work area shall be flapped with three (3) weighted, interlocking flaps constructed of six-mil polyethylene.
 6. All free-standing containment barriers, tents, walls or tunnels in "wrap and cut" removal areas shall be constructed of two (2) layers of six (6) mil polyethylene mounted on 2" x 4" studs placed 16" o.c. apart. Furring strips shall be used as needed.
 7. All fittings shall be wrapped with two (2) layers of six (6) mil polyethylene secured tightly to the pipe with duct tape. When all of the fittings are wrapped, the pipes shall be cut in areas away from the fittings. The Contractor may remove fibrous glass pipe insulation as needed to facilitate the cutting process. All of the cut pipes with the intact pipe fitting insulation materials shall be disposed of in fiber drums lined with two layers of six (6) mil polyethylene.
 8. At the conclusion of the abatement work, all surfaces shall be cleaned and all debris, plastic and tape residue shall be removed from the areas.
- f. In order to gain access to the pipe chase, the Contractor shall remove all fixtures and appurtenances, as needed, and remove as much of the bathroom wall as is required to gain safe access to the pipe fitting insulation found in the pipe chase. All pipe fitting insulation debris found in the pipe chase shall be cleaned up immediately.
- g. The Contractor shall provide a unit cost for the removal of the insulation from one pipe fitting. This unit cost shall also be used to determine a credit in the event that there are fewer than twenty fittings found in the pipe chase.
- h. The abatement of the floor covering materials shall be performed using methods which shall not contaminate the building environment with airborne asbestos fibers, as follows:
1. All HVAC equipment, windows and other openings found inside the work area shall be sealed with a silicone caulk, fire-rated expanding foam or two (2) layers of six mil polyethylene.
 2. Air filtration units shall be in operation at all times inside the work areas and exhausted outside the building. One air change shall be provided every fifteen (15) minutes.
 3. Workers shall wear proper respiratory protection and disposable clothing at all times.
 4. The Contractor shall install airtight critical barriers of two (2) layers of six (6) mil polyethylene on all windows, doorways and other openings found in the regulated area.
 5. The tiles shall be removed by applying heat to the surface using an approved heating device. Each individual tile shall be pried from the surface using scrapers and placed in a disposal bag in an intact condition. No hatchets or hammers shall be permitted. In areas where the tiles have been installed on a layer of plywood, the Contractor may

remove the wood layer with the tiles attached (without damaging them) and wrap the pieces in two (2) layers of six (6) mil polyethylene for disposal.

6. If the Contractor employs any method for the removal of the flooring materials that, in the opinion of the Building Owner, their representatives or state regulatory inspectors, causes (or could possibly cause) the building environment to be contaminated with airborne asbestos fibers, all work shall stop until the area is prepared under full containment.
 7. All waste shall be packaged in two (2) six (6) mil polyethylene bags for removal from the site. All sharp-edged materials shall be packaged in fiber drums or burlap bags in addition to the polyethylene bags.
 8. If the floor covering materials are located beneath carpeting, the carpeting shall be cut and removed from the floor in strips. If the tile adheres to the carpeting, the carpeting shall be disposed of as asbestos-containing waste. If the tile does not adhere to the carpeting, the carpeting shall be disposed of as construction waste.
 9. All mastic shall be removed from concrete or leveler sub-flooring using low-odor or no-odor solvents.
 10. Where mastic is to be removed using solvents, the Contractor shall secure one (1) layer of six (6) mil polyethylene to the walls in the work areas, up to a height of at least three feet (3'). In floor tile mastic removal areas located over a crawlspace, the Contractor shall inspect the crawlspace prior to the application of the floor tile mastic remover. The Contractor shall employ whatever measures are needed to prevent the leakage of mastic remover into the crawlspace area. If any mastic remover leaks into the crawlspace area, it shall be the Contractor's responsibility to immediately clean up the material and any contaminated soil. At the conclusion of the project, the Contractor shall inspect the crawlspace area and make sure that no mastic remover is found in the area. In floor tile mastic removal areas adjacent to carpeted floors, the Contractor shall protect the carpeting from being damaged by the mastic remover.
 11. Any free-standing containment barriers or tunnels shall be constructed of three (3) layers of six (6) mil polyethylene mounted on 2" x 4" studs placed 16" o. c. apart. Furring strips shall be used as needed.
 12. In order to properly remove the floor covering materials, the Contractor shall disassemble and/or remove any equipment, appurtenances or fixtures as needed.
 13. The Contractor shall remove and dispose of all cove base molding materials found in the floor tile and mastic removal area. The contractor shall remove all layers of floor covering materials found in the work area.
- 2.2 The Contractor shall keep all stairs, lobbies and lavatories free from the accumulation of waste material, rubbish or construction waste.
 - 2.3 Except for lavatories designated by the Building Owner for the use by the Contractor's personnel, use of existing toilets within the building by the Contractor and his/her personnel shall not be permitted.
 - 2.4 During all phases of the project, two (2) fire exits from any work area shall be maintained, where feasible.
 - 2.5 Unless otherwise noted, all books, files, equipment and other removable objects shall be removed by the Building Owner prior to the commencement of the work.
 - 2.6 The Contractor shall furnish all labor, supervision, materials, services, insurance, equipment and tools necessary for the complete and proper execution of the work.
 - 2.7 All asbestos abatement shall be performed in accordance with the applicable guidelines of the United States Environmental Protection Agency, the Occupational Safety and Health Administration, the New Jersey Department of Health, the New Jersey Department of Labor and the New Jersey Department of Environmental Protection.
 - 2.8 Applicable standards listed in these specifications include, but are not limited to, standards promulgated by the following agencies and organizations. In all cases, this specification shall take precedence where it meets or exceeds any Federal, State or Local regulations.

a. A.N.S.I.

American National Standards Institute
25 West 43rd Street, 4th Floor
New York, NY 10036

- b. A.S.T.M. American Society for Testing & Materials
100 Barr Harbor Drive
P. O. Box C700
West Conshohocken, PA 19428-2959
- c. IBC 2000 International Code Council
New Jersey 900 Montclair Road
Birmingham, AL 35213
- d. U.L. Underwriters Laboratories
36-42 Newark Street, Unit #502
Hoboken, NJ 07030
- e. U.S.E.P.A. U. S. Environmental Protection Agency – Region 2
Division of Enforcement and Compliance Assistance
Air Compliance Branch
290 Broadway, 21st Floor
New York, NY 10007-1866
- f. N.I.O.S.H. National Institute for Occupational Safety and Health
Region 2, 26 Federal Plaza
New York, NY 10007
- g. N.F.P.A. National Fire Protection Association
83 Creek Ridge
Pittsford, NY 14534
- h. N.I.S.T. National Institute of Standards & Technology
100 Bureau Drive
Gaithersburg, MD 20899
- i. O.S.H.A. Occupational Safety & Health Administration
New York Regional Office
1515 Broadway (Astor Plaza), Room 3445
New York, NY 10036
- j. D.O.H. New Jersey Department of Health
Consumer and Environmental Health Services
P. O. Box 369
Trenton, NJ 08625-0369
- k. D.C.A. New Jersey Department of Community Affairs
Asbestos Safety Unit
P. O. Box 816
Trenton, NJ 08625-0816
- l. D.E.P. New Jersey Department of Environmental Protection
Division of Solid Waste Management
Bureau of Compliance and Enforcement
P. O. Box 414
Trenton, NJ 08625-0414
- m. D.O.L. New Jersey Department of Labor & Workforce Development
Asbestos Control & Licensing Section
1 John Fitch Plaza, 3rd Floor
P. O. Box 392
Trenton, NJ 08625-0392

2.9 The Contractor shall assume full responsibility and liability for the compliance with all applicable Federal, State, and Local regulations pertaining to work practices, hauling, disposal and the protection of workers, visitors to the site and persons occupying areas adjacent to the site. The Contractor is responsible for providing medical examinations and maintaining medical records of personnel as required by applicable Federal, State and Local regulations. The Contractor shall indemnify

and hold the Owner and the Owner's representative harmless for failure to comply with any applicable work, hauling, disposal, safety, health or other regulation on the part of themselves, their employees or their subcontractors.

- 2.10 Except to the extent that 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.
- 2.11 The Contractor shall strictly adhere to all precautions necessary for the safety and health of the work person in accordance with provisions of OSHA Standards, 26 CFR 1926.58 (Construction Standards) and 26 CFR 1910.1001 (Industry Standards).
- 2.12 The Contractor shall limit the use of the premises to the work indicated.
- 2.13 The Contractor shall keep existing driveways and entrances serving the premises clear and available to the Owner and their employees at all times. Do not use these for parking or storage of materials.
- 2.14 The Contractor shall not unreasonably encumber the site with materials or equipment. The Contractor shall confine stockpiling of materials and location of storage sheds to areas approved by the Building Owner and their representative.
- 2.15 The Contractor shall lock all vehicles and construction equipment, when parked and unattended so as to prevent unauthorized use. The Contractor shall not leave any vehicles or equipment unattended with the motor running or the ignition key in place.
- 2.16 The Contractor shall maintain the existing building in a safe and weather-tight condition throughout the work period, repair all damage caused by abatement/demolition operations and take all necessary precautions to protect the building.
- 2.17 The Contractor shall properly contain, transport and dispose of all contaminated wastes and materials at a site approved for asbestos disposal. The waste container may be stored on site as per the Building Owner or their representative. The waste container shall be lined with six-mil polyethylene and completely enclosed and locked.
- 2.18 Smoking shall not be permitted in the building or on the premises.
- 2.19 The Contractor shall furnish, install and maintain for the duration of the project all precautions necessary for the safety, health and welfare of the workers and building occupants.
- 2.20 The Contractor shall furnish, install and maintain for the duration of the project all methods and systems necessary to prevent the escape of airborne asbestos fibers to adjacent areas of the building.
- 2.21 The Contractor shall clean, dismantle, remove and replace all items and equipment which should be moved prior to asbestos cleanup, unless otherwise noted.
- 2.22 The Contractor shall dismount all fire, electrical and mechanical fixtures and appurtenances required for proper execution of this contract. A licensed electrician is required and shall be trained in the use of a respirator and handling asbestos materials.
- 2.23 No extensions of time shall be made for any delays unless within five (5) days after the beginning of such delays a written request for additional time shall be filed with the Owner. In case of a continuing cause of delay, only one (1) request is necessary.
- 2.24 The Contractor shall neither make nor assert a claim for damage against the Owner by reason of any delays herein mentioned, including without limitation, delays arising out of change orders and agrees that the sole claim in the event of such delays is limited to extension of time for completion of the work.
- 2.25 The Contractor's inability to secure sufficient personnel for the performance of the contract shall not constitute a basis for extension of time.
- 2.26 The Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the work or the incorporation in the work of any invention, design, process, product or device which is the subject of patent rights or copyrights held by others including patent rights and copyrights held by the Owner or the Architect. The Contractor shall be solely responsible for all damages, losses and expenses arising out of any infringement of patent rights or copyrights incident to the use and the performance of the work or resulting from the incorporation in the work of any invention, design, process, product or device not specified in the Contract Documents and shall defend all such claims in connection with any alleged infringements of such rights.

SECTION 3.0 – DOCUMENTATION

- 3.1 Each bidder shall provide any and all documents requested by the OWNER or their representatives.
- 3.2 Upon award of the contract, the Contractor shall provide any and all documents requested by the OWNER or their representatives.

SECTION 4.0 - NOTIFICATIONS

- 4.1 Where applicable, the Contractor shall notify the following agencies in writing prior to the start of an asbestos abatement project as soon as possible prior to the start of work:
 - a. United States Environmental Protection Agency – Region II
Division of Enforcement and Compliance Assistance
Air Compliance Branch
290 Broadway, 21st Floor
New York, NY 10007-1866
 - b. New Jersey Department of Health
Consumer and Environmental Health Services
P. O. Box 369
Trenton, NJ 08625-0369
 - c. New Jersey Department of Environmental Protection
Division of Solid Waste Management
Bureau of Compliance and Enforcement
840 Bear Tavern Road, P. O. Box 414
Trenton, NJ 08625-0414
 - d. New Jersey Department of Labor & Workforce Development
Asbestos Control & Licensing Section
1 John Fitch Plaza, 3rd Floor
P. O. Box 392
Trenton, NJ 08625-0392
- 4.2 This notification shall include the following:
 - a. Name and address of Contractor.
 - b. Address and description of the building, including size, age and prior use of the building or areas, the amount of friable asbestos material present, location within building (unless entire building is involved).
 - c. Scheduled starting and completion dates for removal.
 - d. Procedures and equipment (including ventilation systems) that shall be employed to comply with the C.F.R., Title 40, Part 61 of the USEPA.
 - e. The name and address of the carting company and of the waste disposal site where the asbestos waste shall be deposited.
 - f. The name and address of the testing laboratory who shall perform air monitoring on behalf of the Owner, and the name and address for the testing laboratory who shall perform OSHA compliance on behalf of the Contractor.
- 4.3 The Contractor shall notify the following agency in writing prior to the removal of asbestos abatement from the project site and the disposal of asbestos waste. All asbestos waste materials destined for shall be in accordance with 40 CFR 61.20-25 before it can be legally transported and disposed of.

New Jersey Department of Environmental Protection
Division of Solid Waste Management
Bureau of Compliance and Enforcement
840 Bear Tavern Road, P. O. Box 414
Trenton, NJ 08625-0414

- 4.4 This notification shall include the following:
- a. Name, address and telephone number of the removal project.
 - b. Quantity in cubic yards and nature of the waste to be disposed (I.D. #27 for Asbestos).
 - c. Name, address and NJDEP registration number of the collector/handler.
 - d. Name and address of the disposal site at which disposal will occur.
 - e. Date and time of disposal.
 - f. A copy of any written notification required by 40 CFR 61.22-61.25.

SECTION 5.0 - PRE-ABATEMENT STATE REQUIREMENTS

- 5.1 For projects involving the abatement (not including materials removed using the "wrap and cut" method or repair work) of more than ten linear feet and/or twenty-five square feet of **friable** asbestos-containing materials, it is unlawful to undertake an asbestos hazard abatement project unless the building owner or their agent first files an application in writing with the Enforcing Agency and obtains the required permit. This permit shall serve as notice for public record in the office of the Enforcing Agency. All work shall be monitored by the Owner's consultant, who shall advise the Enforcing Agency of its findings.
- 5.2 The application for a construction permit shall include the following information:
- a. The name and address of the Contractor.
 - b. The name and address of the private air monitoring firm hired by the Building Owner. The monitor shall be responsible for the continuous monitoring during the asbestos abatement project.
 - c. The name and address of the analytical testing laboratory which shall analyze bulk, dust and air samples as needed.
 - d. Documentation that the building will only be occupied if the work areas can be properly separated and sealed off from the occupied portion of the building.
 - e. The scheduled starting and completion dates for the abatement project.
 - f. Plans and specifications [not less than four (4) sets] indicating the scope of the proposed work and the provisions proposed to contain the asbestos-containing material during abatement work, showing, but not limited to, separation barriers, primary seal/critical barriers, route of travel of removing asbestos waste from the work site and a floor plan indicating exits.
 - g. The name and address of the waste hauler and the name and location of the landfill where the asbestos shall be deposited.
- 5.3 The issuance of the construction permit for asbestos abatement authorizes only the preparation of the job site.

SECTION 6.0 - DOCUMENTATION REQUIRED AT WORK SITE

- 6.1 One copy each of the regulations cited in this work plan shall be available in the Contractor's business office and one copy of each shall be maintained at the job site.
- 6.2 Additional documentation to be available at the job site shall include the following:
- a. A sign in black letters greater than four inches (4") in height stating the following:

"LICENSED BY THE STATE OF NEW JERSEY FOR ASBESTOS WORK"
 - b. The sign shall be displayed prominently outdoors at the worksite.
 - c. A list of emergency phone numbers to include: the monitoring firm employed by the Building Owner, USEPA, OSHA, DOE, local fire, police, hospital and emergency squad.

- d. Work area emergency procedures posted in plain view inside and outside the work areas. Emergency procedures take precedence over decontamination procedures.
 - e. A list of personnel, including all new employees.
 - f. A daily log of all persons entering the work areas, including all visitors. Persons not employed by the Asbestos Contractor shall be required to sign an acceptable waiver form. The waiver form shall be approved by the Environmental Project Manager.
 - g. The daily log shall include a record of start and stop times, any work problems encountered, any corrective action and estimated amount of asbestos waste generated.
 - h. The Contractor shall be responsible for obtaining a copy of the daily monitoring logs from their air testing firms and maintaining them at the job site.
- 6.3 Work schedules and updated progress charts depicting all phases of the work and completion deadlines shall be maintained on site.
- 6.4 A copy of the Waste Hauler's Certificate and copies of all landfill receipts shall be maintained on site.

SECTION 7.0 - PROJECT REVIEW & INSPECTION

- 7.1 The Owner, Owner's Representative, Project Manager and the representatives of agencies having lawful jurisdiction shall at all times have access to the work areas whether the work is in preparation or progress.
- 7.2 The Owner reserves the right to stop all removal operations and cancel this contract if proper environmental, health and safety precautions are not being implemented and adhered to by the Contractor and his/her personnel. If work procedures are not in compliance with the specification, a "Stop Work Order" shall be issued to Contractor by the Owner or Project Manager. The Contractor shall not recommence work until authorized in writing to do so by the Owner or their representative. Further noncompliance of these specifications or safety regulations shall be cause for cancellation of the contract.

SECTION 8.0 - PROTECTIVE CLOTHING/EQUIPMENT FOR ABATEMENT

- 8.1 Listed below are materials, equipment and tools generally used in proper asbestos removal operations. It is not inferred, however, that all materials listed are necessarily required in every asbestos abatement project and, in some instances, materials required to complete the work may not be listed.
- a. Protective clothing: Shall be fire retardant manufactured of "Tyvek" by DuPont (or approved equal) consist of disposable full body coveralls, headcovers and boots as required by the most stringent OSHA standards applicable to the work. Eye protection, hard hats and gloves shall be available.
 - b. Plastic Sheeting: Where needed, provide six (6) mil thick polyethylene sheeting. The polyethylene sheeting shall be taped securely in place, stapled, or fastened by spray-on adhesives, glue beads, horizontal wood battens or the equivalent.
 - c. Where work procedures are in view to the public, black or opaque six mil polyethylene shall be utilized on decontamination chambers, windows, etc.
 - d. Adhesives: Tape shall be high quality duct tape (or approved equivalent) in 2"-3" widths.
 - e. Glove Bags of six mil thickness fitted with long sleeve gloves, a tool pouch and a two inch (2") opening used for water application.
 - f. Support Structures shall be constructed of Polyvinyl Chloride Pipes (P.V.C.) and/or aluminum or wood studs.
 - g. Disposal bags shall be six (6) mil polyethylene bags of a sufficient size for the application. The bags shall be printed with letters of sufficient size and contrast to be readily visible and legible. The label shall state at a minimum:

DANGER
Contains Asbestos Fibers
Avoid Creating Dust
Breathing Asbestos Dust May Cause

Serious Bodily Harm

- h. Caution Signs shall be 14" x 20" in size with a red background and lettered in black. Signs shall be displayed at all routes of access and all visual and physical barriers.

LEGEND	NOTATION
Danger	1" Sans Serif Gothic or Block
Asbestos	1" Sans Serif Gothic or Block
Cancer and Lung Disease Hazard	3/4" Sans Serif Gothic or Block
Keep Out	1/2" Gothic
Authorized Personnel Only	1/2" Gothic
Respirators and Protective Clothing Required in this Area	1/4" Gothic

All signs shall meet OSHA Standards 29 CFR 1926.58.

- i. At all areas of direct access to the work areas (decontamination unit, etc.), display signs (10" x 14") with yellow background and black lettering as follows:

LEGEND	NOTATION
No Food Beverages or Tobacco Permitted	3/4" Block
All Persons Shall Wear Protective Clothing (Coverings) Before Entering the Work Area	3/4" Block
All Persons Shall Shower Immediately After Leaving Work Area and Before Entering the Changing Area	3/4" Block

- j. Amended water or removal encapsulant shall be approved for the particular type and concentration of asbestos dealt with in each circumstance by the Project Manager. Amended Water is water to which a surfactant has been added. The Contractor shall use a mixture of surfactant and water which results in wetting of the material which equals or surpasses the wetting resulting from the use of one (1) ounce of a surfactant consisting of fifty percent (50%) polyoxyethylene ester and fifty percent (50%) polyoxyethylene ether mixed with five (5) gallons of water.
- k. Removal Sealant: The Contractor shall provide a penetrating-type sealant designed specifically for the removal of asbestos-containing material. The Contractor shall use a material which results in the wetting of the asbestos-containing material and retardation of fiber release during disturbance of the material equal to or greater than that provided by amended water as described above. The sealant shall be tinted and meet all applicable fire and building codes.
- l. Filters shall be of sufficient quantity and type (HEPA) for use in respirators and other equipment requiring filters.
- m. The Contractor shall use cleaning materials needed to maintain the specified standard of cleanliness and compatible with the surface being cleaned.
- n. Respiratory Protection shall be in accordance with OSHA Regulation 1926.58 and ANSI Z88.2-1980. There shall be NO EXCEPTIONS to these requirements.
- o. Air Filtration Equipment shall be capable of filtering airborne asbestos fibers.
- p. HEPA Vacuum: The Contractor shall use high efficiency vacuum cleaners with special HEPA filtration to retain asbestos fibers with a capillary tube if to be utilized with a glove bag.
- q. The Decontamination System shall consist of lockers, showers with pump support, respirator storage, equipment storage, etc.
- r. Shower Head and Controls: The Contractor shall provide a factory-made shower head producing a spray of water which can be adjusted for spray size and intensity. The shower shall be fed with water mixed from hot and cold water supply

lines and be arranged so that the control of water temperature, flow rate and shut off is from inside shower without outside aid.

- s. Shower Stall: The Contractor shall provide, for the Shower Area, a leaktight shower enclosure (with integrated drain pan) made of fiberglass or other durable waterproof material, approximately 3' x 3' square with minimum 6' high sides and back and shall be structurally supported as necessary for stability. The shower stall shall be equipped with a hose bib, as specified in this section, mounted at approximately 5' above the drain pan. The pan shall be connected to a reservoir, which shall be connected to a storage barrel. The water shall be disposed of with the asbestos-containing material or used for amended water.
 - t. Sump Pump: The Contractor shall install a totally submersible sump pump (with integral float switch) sized to pump two times the flow capacity of all showers or hoses supplying water to the sump through any filters. The pump shall be capable of pumping debris, sand, plaster or other materials washed off during decontamination procedures without damaging the pump and have an adjustable float switch so that a minimum of 3" remains between the top of the liquid and the top of the sump pan.
 - u. Lumber: The Contractor shall provide kiln-dried lumber of any grade or species.
 - v. Scaffold: The Contractor shall provide all scaffolding and/or staging as necessary.
 - w. Hand Tools: The Contractor shall provide all needed hand tools and ancillary materials to properly complete the work.
 - x. Spray Equipment: The Contractor shall provide spray equipment capable of mixing any wetting agent with water and capable of generating sufficient pressure, volume and having ample hose length to reach all areas of asbestos.
 - y. Communication: The Contractor may utilize "Walkie-Talkies" for communication between the work areas and outside areas.
- 8.2 The Contractor shall have available sufficient inventory of these materials and equipment to accomplish the job, protect the workers, and protect all authorized visitors to the job site.
- 8.3 In procuring all items in this work, it is the Contractor's responsibility to verify the detailed requirements of this guideline and all codes, standards and regulations to verify that the items procured for use on this project meet or exceed the specified requirements.
- 8.4 The Owner reserves the right to reject items incorporated into the work that fail to meet the requirements of this guideline or any applicable codes, standard or regulation.
- 8.5 The mention of any product or manufacturer's name or equipment name does not imply endorsement by the Owner, their representative or the project manager.
- 8.6 "Approved equal" or "equal" shall mean as approved by the Owner, their representative or Project Manager only. They shall be the sole judge as to whether or not a substitute item is equal, and any item specified shall be submitted for approval.

SECTION 9.0 - RESPIRATORY PROTECTION

9.1 Powered Air-Purifying Respirators

- a. Powered air-purifying, positive pressure, full or half-face respirators shall be worn during all phases of the project. If air monitoring results show that fiber counts meet or exceed an action level defined as one-half (1/2) the respirator use limit concentration (50 f/cc), then Type "C" respirators shall be used.
- b. The Contractor shall supply a sufficient quantity of high efficiency respirator filters approved for asbestos so that workers can change filters at any time that flow through the face piece decreases to the level at which the manufacturer recommends filter replacement. HEPA elements in filter cartridges shall be protected from wetting during showering. The entire exterior housing of the respirator including the blower unit, filter cartridges, hoses, battery pack, face mask, belt and cord is to be washed each time a worker leaves the work area. Caution should be taken to avoid shorting the battery pack during the washing. The Contractor shall provide an extra battery pack for each respirator so that one can be charging while one is in use.
- c. Respirator Bodies: The Contractor shall provide full-face type respirators and equip full-face respirators with a nose cup or other anti-fogging device as would be appropriate for use in air temperatures less than 32° F.

- d. Filter Cartridges: The Contractor shall provide, at a minimum, HEPA type filters labeled with NIOSH and MSHA Certifications for "Radionuclides, Radon Daughters, Dust, Fumes, Mists including Asbestos-Containing Dusts and Mists" and color coded in accordance with ANSI Z228.2 (1980). In addition, a chemical cartridge may be added, if required, for solvents, etc. in use. In this case, the Contractor shall provide cartridges that have each section of the combination canister labeled with the appropriate color code and NIOSH/MSHA Certification.
- e. Do not use single, disposable or quarter-face respirators. Use of negative pressure half-face respirators is also prohibited.

9.2 Fit Testing

- a. The Contractor shall provide initial fitting of respiratory protection during a respiratory protection course of training, set-up and administered by an Asbestos Safety Instructor, fit types of respirators to be actually worn by the individual and allow an individual to use only those respirators for which he/she has been trained and fitted.
- b. The Contractor shall check the fit of each worker's respirator by having irritant smoke blown onto the respirator and into the intake port of the motor unit (with the filters in place) from a smoke tube.
- c. The Contractor shall require that each time an air-purifying is put on, it is checked for fit with a positive pressure fit test in accordance with the manufacturer's instructions or ANSI Z88.2 (1980).

SECTION 10.0 - CONSTRUCTION AIDS

- 10.1 The Contractor shall provide all scaffolding, ladders or staging equipment, etc. as necessary to accomplish the work of this contract. Scaffolding may be of suspension type, or standing type such as metal tube and coupler, tubular welded frame, pole or outrigger type or cantilever type. The type, erection and use of all scaffolding shall comply with all applicable OSHA provisions.
- 10.2 During the erection and/or moving of scaffolding, care shall be exercised to avoid damage to the polyethylene floor.
- 10.3 The rungs of all metal ladders, etc., shall be equipped with an abrasive non-skid surface.
- 10.4 All surfaces subject to foot traffic shall have a nonskid surface. Surfaces shall be cleaned as required to remove slippery materials.
- 10.5 At the completion of the removal work, all construction aids shall be cleaned within the work areas and wrapped in one (1) layer of six mil polyethylene sheet and sealed before the work areas.

SECTION 11.0 - AIR FILTRATION SYSTEM

- 11.1 The Contractor shall supply the required number of asbestos air filtration units to the site in accordance with this specification.
- 11.2 The Air Filtration Unit cabinet shall be constructed of steel or other durable materials able to withstand the damage from rough handling and transportation. The width of the cabinet should be less than thirty inches (30") to fit through standard doorways. The cabinet shall be factory sealed to prevent asbestos-containing dust from being released during use, transport or maintenance. Access to and replacement of all air filters shall be from the intake end. The unit shall be mounted on casters or wheels.
- 11.3 The Air Filtration Unit fans shall be rated according to usable air moving capacity under actual operating conditions and shall be centrifugal-type.
- 11.4 The final filter of the unit shall be a HEPA filter. The filter media (folded into closely pleated panels) shall be completely sealed on all edges with a structurally rigid frame.
 - a. A continuous rubber gasket shall be mounted between the filter and the filter housing to form a tight seal.
 - b. Each filter shall be individually tested and certified by the manufacturer to have an efficiency of not less than 99.97% when challenged with 0.03 micron dicytolphthalate (D.O.P.) particles. Testing shall be in accordance with Military Standard Number 282 and Army Instruction Manual 136-300-175A. Each filter shall bear a UL586 label to indicate ability to perform under a specified condition.

- c. Each filter shall be marked with the name of the manufacturer, serial number, air flow rating, efficiency and resistance and the direction of the air flow.
- 11.5 Two stages of prefilters are required in order to protect the final filter by removing larger particles, thus prolonging the life the operating life of the HEPA filter. The first stage prefilter shall be a low efficiency filter [for particles ten (10) microns or larger]. The second stage filter shall have a medium efficiency [for particles as small as five (5) microns]. Prefilters and intermediate filters shall be installed either on or in the intake grid of the unit and beheld in place with special housing or clamps.
 - 11.6 Each Air Filtration Unit shall be equipped with a Magnehelic gauge or manometer to measure the pressure drop across filters and indicate when filters have become loaded and need to be changed. A table indicating the usable air handling capacity for various static pressure readings on the Magnehelic gauge shall be affixed near the gauge for reference, or the Magnehelic reading indicating at what point the filters should be changed, noting cubic feet per minute (CFM) air delivery at that point. The units shall be equipped with an elapsed-time meter to show the total accumulated hours of operation.
 - 11.7 Each unit shall have an electrical (or mechanical) lockout to prevent the fan from operating without a HEPA filter. Units shall be equipped with automatic-shutdown systems to stop the fan in the event of a major rupture in the HEPA filter or blocked air discharge. Warning lights are required to indicate normal operation, a high pressure drop across the filters (filter overloading) and a low pressure drop (major rupture in HEPA filter or obstructed discharge).
 - 11.8 All units shall have electrical components which are approved by the National Electrical Manufacturers Association (NEMA) and Underwriters Laboratories (UL). Each unit shall be equipped with overload protection, sized specifically for the equipment. The motor, fan, fan housing and cabinet shall be grounded.
 - 11.9 Fully operational air-filtration systems shall provide a minimum of four (4) air changes every one (1) hour. The volume in cubic feet shall be calculated by multiplying the floor area by the ceiling height. The total ventilation requirement in cubic feet per minute (CFM) shall be calculated by for the work area by dividing this volume by the air change rate.

$$\text{Ventilation Requirement (CFM)} = \frac{\text{volume of work area}}{\text{fifteen (15) minutes}}$$

- 11.10 The number of units needed to achieve a fifteen (15) minute-change rate shall be determined by dividing the ventilation requirement (CFM) above by the capacity of the exhaust units used.

$$\text{Number of units needed} = \frac{\text{ventilation requirement (CFM)}}{\text{capacity of unit (CFM)}}$$

One (1) additional unit shall be maintained on site as a backup in case of equipment failure or machine shutdown for filter changing.

- 11.11 The Contractor shall provide a sufficient number of air filtration devices in order to maintain an exhaust capacity sufficient to establish and maintain a pressure differential between the work area and all adjacent spaces greater than or equal to 0.03 inches w. c. for unoccupied buildings or 0.05 inches w. c. for occupied buildings.
- 11.12 Where required, pressure differential shall be constantly monitored using manometers. One or more separate pressure monitoring devices shall be installed near the entrances to the work area and any interior spaces from which make-up air is drawn. The Contractor shall be responsible for providing all needed manometers or other pressure monitoring devices. All manometers shall have electronic digital readouts and a continuous tape printout.
- 11.13 The air filtration units shall be located so that the makeup air enters the work area primarily through the decontamination facilities or controlled makeup air inlets (if allowed by regulation) and traverses the work areas as much as possible. The location of the units shall be at a maximum distance from the worker access opening or other makeup air sources
 - a. The end of the unit or its exhaust duct shall be placed through an opening in the plastic barrier or wall covering. The plastic around the unit or duct shall be sealed with duct tape and any exterior exhaust port shall be protected with a cage to prevent vandalism.
 - b. The unit shall always be exhausted to the outside of the building, unless authorized in writing by the Owner's representative or Environmental Project Manager. Do not vent into the nonwork areas of the building.
- 11.14 If allowed by regulation, controlled makeup air inlets shall be provided where required for proper air flow through the work areas in locations approved by the Owner's representative and the Environmental Project Manager. The Contractor shall

make openings in the polyethylene sheeting that allows air from outside the building into the work area if applicable and locate the auxiliary makeup air inlets as far as possible from the exhaust unit(s), off the floor, and away from the barriers separating the work area from occupied, clean areas.

- 11.15 Each unit shall be serviced by a dedicated minimum 115V-20A circuit with overload device tied into an existing building electrical panel which has sufficient spare capacity to accommodate the load of all units connected.
- 11.16 The air filtration system shall be tested before any asbestos-containing material is wetted or removed. After the work area has been prepared, the decontamination facility set up and the exhaust units installed, the units shall be started one at a time. The test of the system shall include:
 - a. Plastic barriers and sheeting move slightly in towards the work area;
 - b. Curtains of the decontamination unit move slightly towards the work area;
 - c. There is a noticeable movement of air through the decontamination unit.
 - d. The use of smoke tubes shall demonstrate a positive motion of air across all areas in which work is to be performed.
- 11.17 The air filtration system shall be used as follows:
 - a. The units shall be started before beginning work. After removal has begun, the units shall be run continuously to maintain constant air flow until decontamination of the area is complete. The units shall not be turned off at the end of the work shift or when removal operations temporarily stop.
 - b. The system shall not be shut down during application of the sealant procedures, unless authorized by the Owner's representative or Environmental Project Manager in writing.
 - c. Removal shall start at a location farthest from the units and proceed toward them. If an electrical power failure occurs, removal shall stop immediately and not resume until power is restored and the units are operating again.
 - d. At the completion of the removal work, the units shall be allowed to run in order to remove airborne fibers that may have been generated during wet removal and cleanup and to purge the work area with clean makeup air. The units may be required to run for a longer time after decontamination, if dry or only partially wetted asbestos material was encountered during removal.
- 11.18 When a final visual inspection and the results of final air tests indicate that the area has been decontaminated, the exhaust units may be removed from the work areas. Before removal from the work areas, the unit shall have the pre-filter removed and disposed of properly, and the intake to the machine shall be sealed with six (6) mil polyethylene to prevent environmental contamination from the filters.

SECTION 12.0 - PROTECTION OF WORKERS AND SITE VISITORS

- 12.1 Respirators, disposable coveralls, head covers and footwear covers shall be provided by the Contractor for the Owner, their representative, the Project Manager and other authorized visitors who may inspect the jobsite. The Contractor shall provide two (2) respirators and six (6) complete coveralls and, where applicable, six (6) respirator cartridges per day. Sufficient HEPA cartridges for powered air-purifying respirators shall be provided for the workers to change during the work shift. No HEPA cartridges shall be used for longer than three (3) work shifts (one work shift equals eight hours). RESPIRATORS SHALL BE WORN AT ALL TIMES WHEN IN THE CONTAMINATED AREA. THERE WILL BE NO EXCEPTIONS.
- 12.2 In accordance with NIOSH, OSHA and ANSI regulations, the Contractor shall have a formal respirator-use program that, at a minimum, shall consist of the following:
 - a. Written standard operating procedures governing the selection and use of respirators;
 - b. Details on the selection of respirators on the basis of the hazards to which the worker is exposed;
 - c. Instruction and training procedures for the proper use respirators and their limitations;
 - d. Procedures for the assignment and fit testing of respirators to individual workers for their individual use;
 - e. Procedures for regularly cleaning and disinfecting respirators after each use;

- f. Procedures for storage of respirators and filters in a convenient, clean and sanitary location;
 - g. Procedures for inspecting respirators during cleaning;
 - h. Procedures for maintaining appropriate surveillance (monitoring) of the work area and degree of employee exposure and stress;
 - i. Procedures for regular inspection and evaluation of the effectiveness of the program;
 - j. Workers shall not be assigned to tasks involving the use of respirators unless it has been determined that they are physically able to perform the work and use the equipment;
 - k. All respirators shall be approved, accepted and recommended.
- 12.3 The Contractor shall guarantee that all employees have participated and are currently participating in the respirator use program.
- 12.4 The Contractor shall provide full body protective clothing to workers and visitors, which shall be worn at all times when in the contaminated area.
- 12.5 All protective clothing shall be disposed of when leaving the contaminated area and a new set used upon return to the contaminated area.
- 12.6 There shall be no smoking, eating, drinking or removal of respirators for any reason in any contaminated areas (shower room, equipment room, contaminated change room and work area). Persons violating this specification shall be denied access to the work area for any reason.

SECTION 13.0 - EMERGENCY PRECAUTIONS

- 13.1 The Contractor shall prepare a contingency plan for emergencies including fire, accident, power failure, air filtration system failure, supplied air system failure or any other event that may require modification or abridgement of decontamination or work area isolation. No provision of this specification should impede safe exiting or provision of adequate medical attention in the event of an emergency.
- 13.2 The Contractor shall provide barricades and adequate protection to safely prevent passage of persons to the area of removal and prevent accidental entrance to the abatement area by any building occupants.
- 13.3 Before the Contractor starts actual abatement of asbestos material, the local fire department and ambulance crews shall be notified as to the dangers of entering the work area. The Contractor shall make every effort to assist these agencies and form plans of action should their personnel need to enter the contaminated area.
- 13.4 Local medical emergency personnel, both ambulance crews and hospital emergency room staff, shall be notified as to the possibility of having to handle injured workers who are contaminated with asbestos dust. They shall be advised on safe decontamination procedures.
- 13.5 First aid shall comply with the governing regulations and all recognized recommendations within the construction industry.
- 13.6 When an event of unusual and significant nature occurs at the site (i.e. failure of the air filtration system, rupture of temporary enclosures, etc.), the Contractor shall prepare and submit a special report listing the chain of events, persons participating, response by the work crew, results of their actions and other related information. When such events are known or predictable, the Contractor shall advise the Owner in advance at the earliest possible date.
- 13.7 The Contractor shall prepare and submit reports of significant accidents at the site and anywhere else work is in progress. For this purpose, a significant accident is defined to include events where personal injury is sustained, or property loss of substance is sustained, or where the event posed a significant threat of loss or personal injury.

SECTION 14.0 - TEMPORARY SERVICES

- 14.1 The Contractor shall provide temporary connection to existing building facilities or provide temporary facilities as required herein or as necessary to carry out the work.
- 14.2 Water Service shall be utilized as follows:

- a. All connections to the Owner's water system shall include backflow protection. Valves shall be temperature and pressure rated for operation of the temperatures and pressures encountered. After completion of use, connections and fittings shall be removed without damage or alteration to the existing water piping equipment. Leaking or dripping valves shall be piped to the nearest drain or located over an existing sink or grade where water shall not damage existing finishes or equipment.
- b. The Contractor shall employ heavy-duty abrasion-resistant hoses with pressure rating greater than the maximum pressure of the water distribution system to provide water to each area and to each decontamination unit and provide fittings, as required, to allow for connection to existing wall hydrants or spouts as well as temporary heating equipment, branch piping, showers, shut-off nozzles and equipment.
- c. Hot water may be secured from the building's hot water system provided backflow protection is installed at the point of connections described in this section and if authorized by the Owner and their representative.

14.3 Temporary electrical service shall be utilized as follows:

- a. The Contractor shall provide service to the decontamination unit sub-panel with a minimum sixty (60) amp, two (2) pole circuit breaker or fused disconnect connected to the building's main distribution panel. The sub-panel and disconnect shall be sized and equipped to accommodate all electrical equipment required for completion of the work.
- b. The Contractor shall provide identification warning signs at power outlets which are other than 110-120 volt power and provide polarized outlets for plug-in type outlets to prevent insertion of 110-120 volt plugs into higher voltage outlets. Dry type transformers shall be provided, where required, to provide voltages necessary for work operations.
- c. The Contractor shall provide receptacle outlets equipped with ground-fault circuit interrupters, reset button and pilot light for plug-in connection of power tools and equipment.
- d. The Contractor shall use only grounded extension cords and use "hard-service" cords where exposed to abrasion and traffic. The Contractor shall only use single-length cords or waterproof connectors to connect separate lengths of electric cords, if single lengths shall not reach areas of work.
- e. The Contractor provide incandescent lamps of wattage required for adequate illumination and protect the lamps with guard cages or tempered-glass enclosures where fixtures are exposed to breakage by construction operations. Exterior fixtures shall be provided where existing fixtures are exposed to moisture.

- 14.4 The Contractor shall provide type "A" fire extinguishers for temporary offices and similar spaces where there is any danger of electrical or grease-oil-flammable liquid fires. In other locations, type "ABC" extinguishers or a combination of several extinguishers of NFPA-recommended types for the exposure in each case shall be provided. The extinguishers shall also comply with the applicable recommendations of NFPA Standard 10 "Standard for Portable Fire Extinguishers." The Contractor shall provide not less than one extinguisher in each work area in the equipment room of the decontamination unit and one (1) outside the work area in the clean room. If there is to be any use of cutting torches, one worker shall maintain a fire watch in each area, constantly having immediate access to an extinguisher.

SECTION 15.0 - DECONTAMINATION PROCEDURES

- 15.1 Where required, the Contractor shall provide an adequate decontamination unit consisting of a serial arrangement of rooms or spaces adjoining the work area or a decontamination trailer. Each airlock shall be clearly identified and separated from the others by plastic crossover sheet doors designed to minimize fiber and air transfer as people pass between areas. A minimum of two (2) layers of six (6) mil polyethylene shall be required for floors, walls and the ceiling for the on-site constructed decontamination units. Plastic cross-over sheet doors shall have at least three layers of six mil polyethylene sheets and be weighted so as to fall into place when people pass through the area. Decontamination chamber doors shall be of sufficient height and width to enable replacement of equipment that may fail and to safely stretch or carry an injured worker from the site without the destruction of the chamber or unnecessary risk to the integrity of the work area. Such doorways must be at least four feet (4') wide and the distance between each set of flaps must be at least four feet (4') apart. Any alternative methods to the use of cross-over polyethylene sheet doors, including louvered or flapped swinging doors, must be approved by the Owner or its representative. Alternative doors shall swing in both directions.

15.2 The Personnel Decontamination Unit shall be constructed as follows:

- a. A Changing Room shall be provided for the purpose of changing into protective clothing. It shall be constructed using polyethylene sheeting (minimum: six-mil in thickness) and located in a manner such that access shall to the work area shall be from the changing room through the shower room. If both males and females utilize the decontamination unit,

black or opaque polyethylene shall be utilized. This room shall be separated from the building by three interlocking weighted flaps made of six-mil polyethylene.

- b. In this room, the worker shall leave all street clothes and dress in clean disposable coveralls and put on respiratory protection. No asbestos-contaminated items shall be allowed to enter this room. Workers shall enter this room either from outside the structure dressed in street clothing or naked from the showers.
- c. A suitable existing room may be used as the changing room if it is suitably located and a configuration whereby workpersons may enter the changing room directly from the shower room. Authorization for this shall be obtained from the Owner's representative in writing prior to the start of work.
- d. The floor of the changing room shall be kept dry and clean at all times. Overflow water from shower shall not be allowed to wet the floor in the changing room.
- e. All surfaces in the change room shall damp wiped twice after each shift with a disinfectant solution.
- f. An adequate supply of bath towels shall be available at all times.
- g. The Contractor shall post information for all emergency phone numbers and procedures and provide storage lockers for employees.
- h. The Contractor shall construct a Shower Room used for transit by cleanly dressed workers entering the work area from the outside or by workers headed for the showers after undressing in the equipment room. This room shall be separated from the clean room and equipment room by three (3) interlocking weighted flaps made of six-mil polyethylene. The Contractor shall provide a fully operational portable shower and temporary extensions of existing hot and cold water and drainage, as necessary, to properly operate this shower. If males and females both use the shower, the shower room shall be constructed of black or opaque polyethylene.
- i. An adequate supply of soap and shampoo shall be available at all times and the shower shall be maintained in a sanitary condition.
- j. The shower shall be arranged in a manner as to prevent water from splashing into the clean room.
- k. The water shut off and drain pump operation controls shall be arranged so a single person may shower without assistance from either inside or outside the work area. The shower shall have a stationary adjustable shower head with hot and cold water controls. A garden hose gun is NOT acceptable.
- l. The shower stall shall be constructed of fiberglass or some other permanent material. The shower stall shall not be constructed of polyethylene. The stall shall be a step-through type with an opening at least four feet (4') to allow emergency access to the work area.
- m. The shower must have a drainage basin with a pump to prevent overflow. The shower shall have a platform to stand on. No standing in water shall be permitted.
- n. The Contractor shall construct an Equipment Room used for transit by cleanly dressed workers entering the work area from the outside or by workers headed for the showers after exiting from the work area. This room shall be separated from the work area and shower room by three (3) interlocking weighted flaps made of six-mil polyethylene. The Contractor shall leave work equipment, footwear and additional contaminated work clothing in this area. If males and females both use the decontamination unit, the equipment room shall be constructed of black or opaque polyethylene.
- o. The work area shall be separated from the equipment room by three (3) interlocking weighted flaps made of six-mil polyethylene. The Contractor shall damp wipe clean all surfaces after each shift change to prevent the buildup of debris on the polyethylene.
- p. Arrows shall be placed on all weighted flaps in the decontamination unit to indicate the direction of the overlap and travel.
- q. If any decontamination unit is located within an area containing asbestos-containing material on overhead ceilings, ducts, piping, etc., the decontamination unit shall be constructed with a plywood ceiling (at least 1/4" thick) covered with at least one layer of six-mil thick polyethylene.

- r. Where the decontamination area is immediately adjacent to and/or within view of occupied areas, a visual barrier of six-mil thick sheet of opaque polyethylene shall be constructed in order to maintain worker privacy and shield the work activities from view. If the area adjacent to the decontamination area is accessible to the public, the Contractor shall construct a solid barrier on the public side of the sheeting to protect it. This barrier shall be constructed of 1/2 inch thick plywood and wood or metal studs and covered with two layers of six-mil polyethylene on each side.
- s. The Contractor shall provide a subpanel at the changing room or a location approved by the Environmental Project Manager to accommodate all needed equipment. The source of power shall come directly from a building electrical panel. All electrical branch circuits shall be connected to ground-fault circuit protection devices.

15.3 The decontamination sequence is as follows:

- a. The workers shall enter the work area in the following manner:
 - 1. The worker enters the change room and removes street clothing, puts on clean disposable coveralls and respirator and passes through the shower room into the equipment room.
 - 2. Any additional clothing and equipment left in the equipment room and required by the worker is put on. These items shall be treated as asbestos-contaminated.
 - 3. The worker then proceeds to the work area.
- b. The workers shall exit the work area in the following manner:
 - 1. Before leaving the work area, the worker shall remove all gross debris from coveralls and feet.
 - 2. The worker then proceeds to the equipment room and removes all clothing except for respiratory protection equipment. Extra work clothing may be stored in the contaminated end of the equipment room. Disposable clothing shall be placed in a bag for disposal with other contaminated material.
 - 3. After showering, the worker proceeds to the change room and dresses in either new coveralls for another entry into the work area or street clothes if exiting the site.

15.4 All workers shall adhere to the following personal decontamination procedures when exiting the work area:

- a. When exiting the area, the worker shall remove disposable coveralls, disposable head covers, disposable footwear in the equipment room. Still wearing a respirator, the worker MUST proceed to the shower and adhere to the following procedure:
 - 1. The worker shall thoroughly wet the body including hair and face. If using a PAPR, the worker shall hold the blower unit away from the water to keep the unit dry.
 - 2. With the respirator still in place, the worker shall thoroughly wash the body, hair, respirator facepiece and all parts of the respirator (except the blower unit and battery pack of a PAPR).
 - 3. The worker shall take a deep breath and remove the respirator after completely wetting the hair, face and respirator. After removing the respirator, the worker shall wash the face piece inside and out.
 - 4. The worker shall shut off the PAPR, cap the inlets to the cartridges, thoroughly wash the blower unit and hoses and wash the battery pack with a wet rag. Do not get water in the battery pack or it will short out and destroy the battery.
 - 5. The worker shall shower completely with soap, shampoo and water and rinse thoroughly.
- b. The worker shall rinse off the shower room walls and floor prior to exit and proceed from the shower to the change room.

15.5 A Waste or Equipment Decontamination Unit may be constructed if needed. This type of decontamination unit shall consist of one (1) chamber four feet by four feet in size (4' x 4'), constructed of two (2) layers of six-mil polyethylene mounted on wood or metal studs.

- a. The first room shall be a Wash Room. This shall be for cleaning of bagged or packaged asbestos-containing waste materials passed from the work area. This room shall contain a hose to clean the material. This room shall be separated from the work area by a doorway with three (3) interlocking weighted flaps made of six-mil polyethylene.
 - b. Equipment or material shall be taken from the work area through the Equipment Decontamination Unit as follows:
 1. In the wash room, the contaminated equipment or sealed polyethylene bags shall be cleaned and passed through the clean room. All sealed waste bags are placed in another clean bag and passed to workers on the exterior of the building for placement in the waste container. All clean equipment shall be placed in an area away from the work area.
 2. AT NO TIME SHALL ANY WORKERS PASS THROUGH THE WASTE DECONTAMINATION UNIT WHILE ENTERING OR EXITING THE WORK AREA!
- 15.6 Debris and residue shall be cleaned from the inside of the decontamination units and from the shower pans on a daily basis. After each shift change, all surfaces shall be damp wiped or hosed down. If the change room of the personnel decontamination becomes contaminated with asbestos-contaminated debris, the entire decontamination unit shall be sealed off and abandoned and a new decontamination unit shall be erected with the former changing room used as the new equipment room.

SECTION 16.0 - WORK AREA PREPARATION

- 16.1 The "work area" is the area where the abatement of asbestos-containing materials is to occur. The work area is considered to be contaminated during the abatement work and shall be isolated from the rest of the building and decontaminated at the completion of the asbestos abatement work.
- 16.2 The Contractor shall completely isolate the work area from other parts of the building so as to prevent asbestos-containing dust or debris from passing beyond the work area(s). Should the area beyond the work area(s) become contaminated with asbestos-containing dust or debris as a consequence of the work, the Contractor shall clean those areas at no additional cost to the Building Owner.
- 16.3 The Contractor shall place all tools, scaffolding, staging, etc. necessary for the work in the area to be isolated prior to the erection of the plastic sheeting and temporary enclosure.
- 16.4 Employees of the Contractor permitted pursuant to N.J.A.C. 8:60 and N.J.A.C. 12:120 or persons employed by the Building Owner, who have successfully completed a maintenance/custodial/worker training course approved by the NJDOH, unless the room and objects within it are shown to be uncontaminated by asbestos in which case other employees of the Building Owner or Contractor may be used, shall clean with wet cloths and/or HEPA vacuums as appropriate all items that can be removed from the work area without disrupting the asbestos material, unless the room and objects within it are shown to be uncontaminated by asbestos in which case other employees of the Building Owner or Contractor may conduct the cleaning. This shall include furniture, equipment, drapes and curtains. The cloths used for cleaning shall be disposed of as asbestos-contaminated waste.
- 16.5 In accordance with applicable Federal or State regulations, the Building Owner shall clean and remove all uncontaminated removable merchandise, equipment and/or supplies from the work area before commencing work and completely cover them with two (2) layers of six-mil polyethylene securely held in place with duct tape. Such merchandise and equipment shall be considered outside the work area unless the covering plastic or the seal is breached.
- 16.6 The Contractor shall put warning signs at all physical and visual barriers.
- 16.7 Before continuing with any work in preparing temporary enclosures, the Contractor shall provide workers with respiratory protection.
- 16.8 Critical barriers shall be constructed as follows:
- a. The Contractor shall separate the work area from other portions of the building and exterior with 2" wide caution tape and warning signs.
 - b. The entrance into a work area shall have three weighted interlocking flaps constructed of six mil polyethylene.
 - c. All ventilation openings, lighting fixtures, doorways, windows, skylights, convectors, floor drains and other openings shall be sealed with two (2) layers of six-mil polyethylene sheeting and/or duct tape. These seals shall be maintained

until all work, including project decontamination, is completed. Care shall be taken in sealing lighting fixtures to avoid melting or burning of sheeting.

- d. If needed, sheet plastic shall be mechanically supported independently of tape or spray cement seals so that the seals do not support the weight of the plastic, by mounting plywood squares (6" x 6" x 3/8") shall be mounted on the tape and plastic at each end corner at a maximum of four feet on centers and held in place with one 6d smooth masonry nail or electra galvanized common nail driven through the center of the plastic.

- 16.9 The Contractor shall construct a proper Decontamination Unit and install a proper Air Filtration System.
- 16.10 The Contractor shall clean housings and ducts of all dust/dirt materials prior to the erection of the primary seal/critical barrier polyethylene sheeting.
- 16.11 All electrical and mechanical items such as lighting fixtures, clocks, diffusers, registers, electric panels, escutcheon plates, etc. which cover any part of the surface to be worked on shall be removed or properly sealed with two (2) layers of fire-rated six (6) mil polyethylene.
- 16.12 If the enclosure barrier is breached in any manner that could allow the passage of asbestos debris or airborne fibers, the affected area shall be added to the work area and enclosed in a manner the same as the work area.
- 16.13 Any free-standing containment barriers or tunnels shall be constructed of three (3) layers of six (6) mil polyethylene mounted on 2" x 4" studs placed 16" o. c. apart. Furring strips shall be used as needed.
- 16.14 In a limited containment abatement area, after critical and separation barriers are secured, polyethylene shall be installed as follows:
 - a. Two layers of polyethylene shall be secured to the floor. Any airtight tents constructed in the work area shall be constructed of two (2) layers of six (6) mil polyethylene.
 - b. Any free-standing containment barriers or tunnels shall be constructed of three (3) layers of six (6) mil polyethylene mounted on 2" x 4" studs placed 16" o.c. apart. Furring strips shall be used as needed.

SECTION 17.0 - WET REMOVAL OF ASBESTOS-CONTAINING OR ASBESTOS-CONTAMINATED MATERIALS

- 17.1 Wet removal of asbestos-containing and asbestos-contaminated materials shall be conducted as follows:
 - a. Any changes to this procedure shall be in writing from the Environmental Project Manager.
 - b. Prior to and during the abatement, all asbestos-containing and asbestos-contaminated materials shall be misted with amended water, which shall aid in minimizing fiber release during work. The material shall be wetted as necessary to ensure that the material is thoroughly wetted throughout.
 - c. A fine, low-pressure spray of amended water or removal sealant shall be applied to prevent fiber disturbances prior to removal. The use of high revolutions per minute (RPM) power equipment, pressure washers or hydro-blasters is prohibited.
 - d. Work shall start in areas nearest to the decontamination unit and work towards the air filtration units.
 - e. Removal of the asbestos material shall be done in small sections by two-person teams, on staging platforms, if needed. The wet material from each section shall be packed and sealed in six-mil plastic bags. When possible, one worker will remove and hand sections of the material to the other worker who will place the material in bags.
 - f. All water-soaked material shall be picked up and bagged before it dries to prevent water loss due to evaporation. The Contractor shall maintain good housekeeping practices throughout the duration of the project.
 - g. Contaminated material with sharp edged items shall be cut to size while adequately wet, placed in small cardboard boxes and double-bagged, or single-bagged and placed in fiber drums.
 - h. Bags and drums shall be marked with the label prescribed in Section 61.22(c) of the EPA regulations. The outside of all containers shall be wet cleaned or HEPA vacuumed before leaving the work area.

- i. After removal, the underlying material shall be brushed with a stiff, nylon bristle brush. WIRE BRUSHES ARE NOT PERMITTED. After the substrate is brushed, it shall be wet wiped with amended water.
- j. If at any time the airborne fiber level outside the isolated work area or the clean room of the decontamination rises above 0.010 f/cc, the work shall stop immediately and air cleaning equipment and cleanup procedures shall be implemented to reduce the fiber levels less than 0.010 f/cc.
- k. If at any time the airborne fiber level inside the isolated work area exceeds exceeds 0.1 f/cc (action level), the work shall stop immediately and air cleaning, wetting and surface cleaning procedures shall be implemented.
- l. The first worker to enter the removal area at the beginning of each work day shall carefully wet the walls and floors with a fine mist of amended water in order to moisten and residues which may have dried from the previous day.
- m. All free water (in contaminated areas) shall be retrieved and added to asbestos-contaminated waste and/or placed in plastic lined leak-tight drums and/or solidified with an acceptable polymer.

SECTION 18.0 - THE GLOVE BAG TECHNIQUE

- 18.1 The removal of asbestos by use of the glovebag shall be limited to the removal of asbestos-containing insulation from pipe fittings, elbows and pipe.
- 18.2 If applicable, any ceiling tiles directly below any asbestos-containing pipe or pipe joint insulation shall be removed and no work shall occur until all of the ceiling tiles have been properly removed.
- 18.3 A minimum of two (2) persons are required to perform a glovebag removal. All necessary materials and supplies shall be brought into the work area before removal begins.
- 18.4 A visual inspection of the pipe where the work is to be done shall be performed to determine if any damaged pipe covering exists. If damaged material exists, the pipe shall be wrapped in polyethylene and secured with tape. This procedure shall prevent high airborne fiber concentrations from occurring during the glovebag work caused by pipe lagging hanging several feet or yards away which may jarred loose by the activity. Debris which has accumulated on the floor and other surfaces shall be cleaned up as necessary. If the pipe is undamaged, one (1) layer of tape shall placed around the pipe at each end where the glovebag will be attached to provide a good surface to which to seal the ends of the glovebag and minimizes the chance of releasing fibers when the tape at the ends of the glovebag is peeled off at the completion of the job.
- 18.5 The top of the glovebag shall be slit open (if necessary) and cut down the sides to accommodate the sides of the pipe [about two (2) inches longer than the pipe diameter].
- 18.6 The necessary tools shall be placed into the pouch located inside the glovebag. These tools include, but are not limited to, the bone saw, utility knife, rags, scrub brush, wire cutters, tin snips and wettable cloth. Cut out a doughnut shape in the cloth with the inner diameter of the pipe insulation being removed and cut a slit in each of the two doughnuts so they can be slipped around the pipe.
- 18.7 One strip of tape shall be placed along the edge of the open top slit of the glovebag for reinforcement.
- 18.8 The workers shall place the glovebag around the section of pipe to be worked on and staple the top together through the reinforcing tape at intervals of approximately one (1) inch. The workers shall then fold the stapled top flap back and tape it down and then tape the ends of the glovebag to the pipe.
- 18.9 Using the smoke tube and aspirator bulb, the crew shall place the tube in the water sleeve. By squeezing the bulb the worker will fill the bag with visible smoke. After removing the smoke tube and closing the water sleeve, squeeze the glove bag and look for smoke leaking out of the bag. Any leaks shall be sealed.
- 18.10 The next step is to insert the wand from the water sprayer into the water sleeve and seal it tightly with tape to prevent leakage.
- 18.11 One worker shall place their arms into the long-sleeved gloves while the second worker directs the water spray at the work.
- 18.12 If the section of pipe is covered with an aluminum jacket, this is removed first, using the wire cutters to cut any bands and the tin snips to remove the aluminum. All sharp edges shall be folded in order prevent cutting the bag when it placed in the bottom. A box may be put in the bottom of the bag when the tools are put in and the metal my be placed in the box to further protect the bag from being cut.

- 18.13 After the it is exposed, the insulation shall be cut with the bone saw while being kept wet.
- 18.14 Once the ends are cut, the section of insulation shall be cut from end to end with the utility knife without puncturing the bag. Wetting should be done continuously.
- 18.15 All tools shall be rinsed with the water inside the bag and placed in the pouch.
- 18.16 The insulation can then be lifted off of the pipe and gently placed in the bottom of the bag.
- 18.17 The pipe is then scrubbed with the brush and the rags.
- 18.18 The doughnut-shaped pieces of wettable cloth shall be over the exposed ends of the remaining pipe.
- 18.19 Replace the water wand with the nozzle from the HEPA vacuum and turn on the vacuum only briefly to collapse the bag. After removing the vacuum nozzle, the water sleeve shall be sealed with tape.
- 18.20 From outside the bag, the tool pouch shall be pulled away from the bag. The twisted portion of the bag shall be sealed and the tool pouch cut away from the glove bag, cutting through the twisted part of the bag. At this time, the tools may be placed in another glovebag or in a bucket of water for cleaning. Rags and scrub brushes may not be cleaned and must be discarded. Sliding of glovebags shall not be done.
- 18.21 With the removed insulation in the bottom of the bag, the top of the bag should be twisted several times and taped shut to keep the material in the bottom of the bag during its removal.
- 18.22 A six-mil thick disposal bag shall be slipped over the glovebag while still on the pipe. The top of the glovebag is then cut loose from the pipe and taken down inside the disposal.
- 18.23 All surfaces shall in the work area shall be cleaned using disposable cloths wetted with amended water. These cloths shall be disposed of as asbestos-containing waste or rinsed thoroughly to remove visible debris. After drying, all surfaces shall be cleaned again using a HEPA vacuum.
- 18.24 All contaminated articles, debris, etc. shall be placed in the bag with the waste.
- 18.25 The top of the disposal bag shall be twisted closed, folded over and sealed with duct tape. The bag shall then be placed into a second labeled six-mil disposal bag which is also sealed.
- 18.26 Air sampling shall be conducted after the completion the work to determine if there was undetected leakage from the bag. All barriers may removed once the area has been found to be safe for re-entry.

SECTION 19.0 - APPLICATION OF SEALANT

- 19.1 The sealant shall be an asbestos-binding compound or approved equal.
- 19.2 Application of sealant shall proceed as follows:
- a. After completion of the cleaning of all surfaces in the work area, the Contractor shall spray coat all dried exposed surfaces with a sealant. The color of this coat shall be separate and distinct from the underlying substrate. The surfaces to be coated shall include surfaces from which asbestos-containing materials have been removed and the polyethylene which has been used to cover walls, floors, non-removable fixtures and equipment.
 - b. Two (2) coats of the sealant shall be applied to the substrate after all asbestos-containing material has been removed. Application of the sealant shall be with an airless spray gun and shall be in strict accordance with the manufacturer's instructions.

SECTION 20.0 - CLEANUP PROCEDURES

- 20.1 At the completion of the asbestos abatement work, all gross debris generated by the asbestos abatement work will have been removed and disposed of.

- 20.2 At the commencement of the cleanup work, the primary protection barriers, the separation barriers between the work area and non-work areas, primary seals on fixtures, doorways, vents, etc., all decontamination units and the air filtration devices shall be in place and fully operational.
- 20.3 The first cleaning of all surfaces in the work area, including items of the remaining sheeting, tools, scaffolding and/or staging equipment shall be done by damp cleaning and mopping and/or vacuuming with a high efficiency particulate (HEPA) filtered vacuum. No dry dusting or sweeping shall be permitted and all cloths used in the cleaning shall be disposed of as asbestos-containing material. This cleaning shall be continued until there is no visible debris from removed materials or residue on plastic sheeting or other surfaces.
- 20.4 After cleaning, the Contractor shall wait a sufficient amount of time to allow the surfaces to dry and to allow the air filtration machines to clean the air. The air filtration machines shall remain in operation at all times.
- 20.5 After the sealant has been applied and allowed to dry, any polyethylene used to cover the ceilings, floors, walls, fixtures and equipment shall be carefully removed and rolled up with the contaminated portion inside. All equipment, machinery, scaffolding, tools, etc., within the isolated work area shall be cleaned with amended water, moved to the equipment room and properly removed from the work area.
- 20.6 After the removal of the polyethylene, a final cleaning of the area shall be done. All surfaces shall be cleaned, allowed to dry and cleaned again. Used cloths and sponges shall be disposed of as contaminated waste. Air filtration units shall remain in operation at all times and sufficient time shall be allotted to allow all surfaces in the area to dry.
- 20.7 If the area is found to visually clean, the air monitoring technician shall perform re-occupancy sampling. If the reoccupancy standard(s) [0.010 fibers per cubic centimeter for each of five (5) samples taken within the work area and/or an average of 70 structures per square millimeter for five samples taken within the work area) is/are not met, final cleaning and air testing procedures shall be repeated. If the re-occupancy standards are met, the Contractor shall remove the critical barriers separating the work area from the rest of the building, clean with amended water all areas where the barriers were attached and remove the air filtration system.
- 20.8 Where required, post-removal samples shall be taken and analyzed by Phase Contrast Microscopy (PCM), using the method outlined in the NIOSH Method 7400.
- a. After the work area is clean, post-removal sampling shall be done in order to establish that conditions are safe for the removal of the critical barriers and the re-occupancy of the area. Sufficient time shall be allowed for the drying of the surfaces. All air filtration units shall be in operation during the monitoring.
 - b. During the monitoring, normal occupancy conditions shall simulated using propeller fans or leaf blowers. Fans shall be placed in all areas to be sampled so as to cause settled fibers to rise and enter the air. All fans shall have fan blades with a radius of at least one foot and shall be capable of creating a minimum air velocity of 500 feet per minute and may be of the oscillating type. Sampling pumps and media shall be placed 20-40 feet at a right angle from the line(s) of air flow created in front of the fan. The leaf blower and its use must meet the criteria set forth in EPA Document 560/5-85-024, Guidance for Controlling Asbestos-Containing Materials in Buildings, appendix section M.1.5., or any replacement criteria set forth by the USEPA. Their use should be restricted to general occupancy areas, and they should not be used in any space with an open dirt, sand or gravel floor.
 - c. If the re-occupancy standard (<0.010 fibers per cubic centimeter Phase Contrast) is not met, the Contractor shall repeat final cleaning and continue decontamination procedures from that point. The Contractor shall be responsible for all costs incurred for additional air monitoring procedures, including labor and air sample analysis.
 - d. If the release criteria is met, the Contractor shall remove the critical barriers separating the work area from the rest of the building and clean with amended water all areas where the barriers were attached. The air filtration units shall be shut down and sealed with polyethylene sheeting and tape to form a tight seal at the intake.
- 20.9 Where required, post-removal samples shall be taken and analyzed by Transmission Electron Microscopy (TEM), using the method outlined in 40 CFR 763.
- a. After the work area is clean, post-removal sampling shall be done in order to establish that conditions are safe for the removal of the critical barriers and the re-occupancy of the area. Sufficient time shall be allowed for the drying of the surfaces. All air filtration units shall be in operation during the monitoring.
 - b. During the monitoring, normal occupancy conditions shall simulated using propeller fans or leaf blowers. Fans shall be placed in all areas to be sampled so as to cause settled fibers to rise and enter the air. All fans shall have fan blades with

a radius of at least one foot and shall be capable of creating a minimum air velocity of 500 feet per minute and may be of the oscillating type. Sampling pumps and media shall be placed 20-40 feet at a right angle from the line(s) of air flow created in front of the fan. The leaf blower and its use must meet the criteria set forth in EPA Document 560/5-85-024, Guidance for Controlling Asbestos-Containing Materials in Buildings, appendix section M.1.5., or any replacement criteria set forth by the USEPA. Their use should be restricted to general occupancy areas, and they should not be used in any space with an open dirt, sand or gravel floor.

- c. If the re-occupancy standard is not met, the Contractor shall repeat final cleaning and continue decontamination procedures from that point. The Contractor shall be responsible for all costs incurred for additional air monitoring procedures, including labor and air sample analysis.
- d. If the release criteria is met, the Contractor shall remove the critical barriers separating the work area from the rest of the building and clean with amended water all areas where the barriers were attached. The air filtration units shall be shut down and sealed with polyethylene sheeting and tape to form a tight seal at the intake.

SECTION 21.0 - DISPOSAL OF ASBESTOS-CONTAINING WASTE

- 21.1 The Contractor shall not allow asbestos materials to dry out or collect on the floors. Removed material shall be immediately placed in proper bags and sealed.
- 21.2 Each bag is to be sealed by twisting the open end and then tying an overhand knot in the twisted material or other approved technique which form a leak-tight seal. The bag shall then be placed in another bag, which is also sealed for transport to the disposal site. Broken or split bags shall be rebagged.
- 21.3 Warning labels, having waterproof print and permanent waterproof adhesive, shall be affixed to all bags, dumpsters, trucks and other containers used for asbestos. The labels shall be conspicuous and legible and shall contain the following warning (as a minimum):

DANGER
Do Not Open
Avoid Creating Dust
Breathing Asbestos Dust May Cause
Serious Bodily Harm

- 21.4 All waste bags shall also be labeled with the name and address of the Contractor and the generator of the waste.
- 21.5 All waste shall be placed in a waste container located outside of the building. The waste shall be transported to the container when the building is least occupied. The waste container shall be completely enclosed and locked and is to be only opened to put in materials from the removal area. Warning signs shall be placed on the waste container.
- 21.6 The Contractor shall transport all sealed bags to an approved sanitary landfill disposal site. Disposal shall be in accordance with all applicable Environmental Protection Agency and Department of Environmental Protection regulations.
- 21.7 The Contractor shall be responsible for obtaining approval of an asbestos waste disposal site in compliance with Section 61.25 of the EPA regulations and all other Federal, State and Local regulations. All transportation shall be performed by a registered waste hauler. The Contractor shall arrange with the transporter to obtain copies of receipts from the disposal site, indicating that the waste has been disposed of properly. The Contractor shall forward copies of these receipts to the Building Owner and their representatives.

SECTION 22.0 - AIR MONITORING

- 22.1 Air monitoring on this project (except OSHA compliance monitoring) shall be performed by the safety monitor. The Abatement Contractor shall be responsible for providing daily OSHA compliance monitoring as per 29 CFR 1926.58 at no cost to the Building Owner. The Contractor shall fully cooperate with the safety monitor and all others responsible for testing and inspecting the jobsite.
- 22.2 None of the air tests collected by the Owner or their representatives are being collected for the purpose of meeting the Contractor's responsibilities under OSHA regulations, nor are they being conducted for the purpose of assessing the respiratory protection for the workers. It is the responsibility of the Contractor and their personnel to cooperate fully with the efforts of the Owner and their representatives at all times and ensure the ease of access to and from the work area for the effective completion of the monitoring work.

- 22.3 Any tampering with any equipment involved with the air testing or the ability of the air monitoring technician to perform any required duties shall be considered an attempt at falsifying reports and records to Federal and State agencies, and each offense shall be prosecuted under applicable State and Federal laws to the fullest extent possible.
- 22.4 No abatement work shall be initiated unless the Owner's consultant has been notified.
- 22.5 All abatement procedures may be stopped by the Environmental Project Managers if proper environmental, health and safety precautions are not strictly adhered to by the Contractor and their personnel. The Owner and their representative reserve the right to stop abatement operations and cancel the contract if proper environmental, health and safety precautions are not being strictly implemented and adhered to by the Contractor and their personnel.
- 22.6 Air testing shall be performed by the air monitoring technician as follows:
- a. If required, pre-removal sampling shall be conducted to determine a background baseline level. The analytical method shall be Phase Contrast Microscopy (NIOSH 7400) and. One sample shall be taken per 30,000 cubic feet of space.
 - b. Post-removal sampling shall be conducted as follows:
 1. Where applicable, the re-occupancy standard for the post-removal sampling shall be when the average concentration of five (5) air samples collected within the work area containment and analyzed by the Transmission Electron Microscopy method outlined in Appendix A of Subpart E of 40 CFR Part 763 - "Asbestos-Containing Materials in Schools" does not exceed 70 structures per square millimeter or is not statistically significantly different as determined by the Z-test calculation.
 2. Where applicable, the re-occupancy standard for the post-removal sampling shall be when the concentration of each of five (5) air samples collected in the work area is less than or equal to 0.010 fibers per cubic centimeter, as analyzed by the Phase Contrast Microscopy (PCM) method outlined in NIOSH Method 7400.
 3. The filter cassettes and sampling train shall be assembled as specified in NIOSH 7400. The collection devices shall be set at between 1.0 and 10.0 liters/minute and shall be calibrated before and after sampling. Records of these calibrations shall be kept. The total volume collected shall be a volume sufficient to achieve a detection limit of <70 structures per square millimeter (TEM) or 0.005 fibers per cubic centimeter (PCM).
 4. Five (5) clearance samples shall be collected within each containment area used to isolate the removal area.
 5. The maximum turnaround time for analysis of the samples shall be 24 hours after submission of the samples to the laboratory.
 6. If the average concentration of five (5) air samples collected within the work area containment and analyzed by the Transmission Electron Microscopy method outlined in Appendix A of Subpart E of 40 CFR Part 763 - "Asbestos-Containing Materials in Schools" exceeds 70 structures per square millimeter or is statistically significantly different as determined by the Z-test calculation, or if the concentration of any of five (5) air samples collected in the work area is greater than 0.010 fibers per cubic centimeter, as analyzed by the Phase Contrast Microscopy (PCM) method outlined in NIOSH Method 7400, the air monitoring technician shall so inform the Contractor, the Owner and the Consultant. The Contractor shall reclean all surfaces using wet cleaning methods. Air filtration units shall remain in use and re-testing shall be repeated until compliance is achieved.
 - c. A minimum of two (2) blanks or 10%, whichever is greater, shall be taken. Blanks will be divided by the work shift. One (1) or more blanks shall be taken with the first round of samples and one (1) or more blanks shall be taken with the second round of samples.
 - d. The final abatement report shall include a summary of the test data, a log of all air samples and all test results.

SECTION 23.0 - COMPLETION OF ABATEMENT

- 23.1 Upon completion of the work and meeting of the clearance criteria, the Contractor shall remove all equipment, materials and debris from the work site, dispose of all asbestos-containing waste material as specified and repair or replace all interior finishes damaged during the course of the asbestos abatement.
- 23.2 If the post-removal air tests or final inspections fail to meet the evaluation criteria, the Contractor shall be liable for the costs of additional air tests and technician labor.

SECTION 24.0 - CONTRACTOR'S FINAL DOCUMENTATION

- 24.1 The Contractor shall submit a report to the Owner upon completion of the removal project. The report shall contain all daily logs, operational data, a summary of all daily OSHA compliance test results, updated medical reports, proof that employees were notified if exposure levels exceeded current standards and documented proof that all asbestos materials have been disposed of in a legal, regulated landfill. No payments shall be made until all waste materials have been removed from the site and disposed of in a legal manner.
- 24.2 Request for payment may be withheld if all reports are not complete. The report shall be signed by an authorized representative of the Contractor.