

**THE SCHOOL DISTRICT OF PHILADELPHIA  
Office of Capital Programs  
440 North Broad Street, 3<sup>rd</sup> Floor – Suite 371  
Philadelphia, PA 19130**

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**Addendum No. 001**

**Subject: 2022 Classroom Modernization  
SDP Contract Numbers: 2022-007-G, 2022-007-E, 2022-007-P**

**Location: Henry Lawton School  
4501 Benner Street, Philadelphia, PA 19135**

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**This Addendum, dated February 04, 2022 shall modify and become part of the Contract Documents for the work of this project. Any items not mentioned herein, or affected by, shall be performed strictly in accordance with the original documents.**

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**ATTENTION ALL BIDDERS – IMPORTANT NOTICE**

**SPECIFICATION**

**Section 01 1135 Abatement Technical Specification**

1. ADD the attached specification section.

**END OF ADDENDUM #001**

SDP CONTRACT NO. 2022-007-G,  
2022-007-E, 2022-007-P

# **TECHNICAL SPECIFICATIONS**

FOR

## **ASBESTOS ABATEMENT**

AT

### **HENRY LAWTON ELEMENTARY SCHOOL # 7330**

**6101 Jackson Street  
Philadelphia, PA 19135**

**Prepared for:**



### **THE SCHOOL DISTRICT OF PHILADELPHIA**

#### **OFFICE OF CAPITAL PROGRAMS**

**440 North Broad Street  
Philadelphia, PA 19130**

**SDP Project No. 900428**

**Prepared by:**

### **Acer Associates, LLC**

**1012 Industrial Drive  
West Berlin, New Jersey 08091**

**ACER Project Number: SDP054**

**Date: October 17, 2021**



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## **I.0 GENERAL REQUIREMENTS**

### **I.1 GENERAL CONDITIONS**

- I.1.1 Definitions as noted in the Specification are included as part of the Contract.
- I.1.2 On behalf of the School District of Philadelphia an Asbestos Project Inspector (API) shall ensure compliance with the Asbestos Control Regulation (ACR) where applicable.
- I.1.3 Except as herein specified, no signs or photographs shall be required other than those necessary for the Contractor to comply with the ACR, and OSHA posting regulations.
- I.1.4 Hot and cold-water supply will be the responsibility of the Contractor. The Owner will ensure access to a water source is available for Contractor use. The contractor shall ensure leak tight conditions and comply with code specification requirements regarding connection.
- I.1.5 Electrical service for Contractor usage shall be available at the facility. All power to work areas shall be brought in from outside the area through ground-fault interrupter (GFI) at the source. Necessary stationary electrical equipment within the work area shall be adequately enclosed and ventilated.
- I.1.6 During the applicable phases of the project, an API will continuously monitor the abatement activities from the beginning to completion.
- I.1.7 Temporary heating and/or cooling shall be the responsibility of the Contractor.
- I.1.8 The Contractor will be responsible for personal employee sampling/monitoring to meet their OSHA requirements. All other testing and inspection for compliance shall be the Owner's responsibility.
- I.1.9 The Contractor may be required to submit a bar-chart or other acceptable construction work schedule.
- I.1.10 All requests for work scheduling shall be coordinated in writing with the Owner.



- 1.1.11 The Contractor shall not proceed until written authorization and approval on the scheduled start date is obtained.
- 1.1.12 The Contractor shall field verify all quantities specified. The quantities shown are for informational purposes only and no guarantee is expressed or implied that the quantities are correct or easily removable from the substrate, surfaces, or components. No allowances shall be made for failure by the Contractor to field verify amounts or existing field conditions.
- 1.1.13 The Contractor shall procure all required insurance prior to commencing work and maintain until completion and final acceptance of the work by the Owner.

## **I.2 SCOPE OF WORK**

- 1.2.1 The Contractor shall conduct the preparation and abatement according to the requirements set forth by the City of Philadelphia Asbestos Control Regulations (ACR).
- 1.2.2 Removal of asbestos containing floor tile in Classrooms 102, 103, 104, 105, 107, and 109.
- 1.2.3 Removal of assumed asbestos containing blackboard glue dots in Classroom 102, 103, 104, 105, 107, and 109.
- 1.2.4 Stabilization of damaged asbestos containing paint in Classroom 102, 103, 104, 105, 107, and 109.
- 1.2.5 Removal of sinks with asbestos containing sound dampening material in Classrooms 102, 103, 104, 105, 107, and 109.
- 1.2.6 Removal of Concrete Masonry Unit (CMU) restroom toilet partitions with asbestos containing paint in the bathrooms associated with Classrooms 102 and 104.
- 1.2.7 Coring and drilling of asbestos containing paint associated with the Concrete Masonry Unit (CMU) and painted concrete ceilings in the original building (Element 1). These locations will need to be identified and marked by the Contractor.

The locations, quantities, and abatement classifications of the asbestos containing materials requiring removal have been summarized in Table I. The contractor shall verify actual quantities.

**Table I**

Location	Material	Quantity	Project
Room 102	12"x12" Floor Tile	1,476 SF	Non-Friable
	Blackboard/Tackboard Glue Dots	45 SF	
	Classroom Sink	8 SF	
	Stabilization of Paint on CMU Walls	33 SF	Minor
	Stabilization of Paint on Concrete Ceiling	20 SF	
Room 102 A Restroom	Removal of CMU toilet Partitions	120 SF	Major
	Removal of CMU Walls	250 SF	
Room 102 B Closet	12"x12" Floor Tile	64 SF	Non-Friable
Room 102 C Closet	12"x12" Floor Tile	72 SF	Non-Friable
	Stabilization of Paint on CMU Walls	7 SF	Small
	Stabilization of Paint on Concrete Ceiling	3 SF	
Room 104	12"x12" Floor Tile	1,440 SF	Non-Friable
	Blackboard/Tackboard Glue Dots	45 SF	Non-Friable
	Classroom Sink	8 SF	Non-Friable
	Stabilization of Paint on CMU Walls	3 SF	Minor
	Stabilization of Paint on Concrete Ceiling	15 SF	
Room 104 A Restroom	Removal of CMU toilet Partitions	120 SF	Major
	Removal of CMU Walls	200 SF	
Room 104 B Closet	Removal of CMU Walls	200 SF	Major
	12"x12" Floor Tile	64 SF	Non-Friable
Room 104 C Closet	12"x12" Floor Tile	50 SF	Non-Friable
	Stabilization of Paint on CMU Walls	5 SF	Incidental
	Stabilization of Paint on Concrete Ceiling	3 SF	
Room 103	12"x12" Floor Tile	888 SF	Non-Friable
	Blackboard/Tackboard Glue Dots	75 SF	Non-Friable
	Classroom Sink	10 SF	Non-Friable
	Stabilization of Paint on CMU Walls	1 SF	Small
	Stabilization of Paint on Concrete Ceiling	8 SF	
Room 105	12"x12" Floor Tile	888 SF	Non-Friable
	Blackboard/Tackboard Glue Dots	75 SF	Non-Friable
	Classroom Sink	10 SF	Non-Friable
	Stabilization of Paint on CMU Walls	10 SF	Minor
	Stabilization of Paint on Concrete Ceiling	15 SF	



**Table I continued**

<b>Location</b>	<b>Material</b>	<b>Quantity</b>	<b>Project</b>
Room 107	12"x12" Floor Tile	888 SF	Non-Friable
	Blackboard/Tackboard Glue Dots	75 SF	Non-Friable
	Classroom Sink	10 SF	Non-Friable
	Stabilization of Paint on CMU Walls	15 SF	Minor
	Stabilization of Paint on Concrete Ceiling	15 SF	
Room 109	12"x12" Floor Tile	888 SF	Non-Friable
	Blackboard/Tackboard Glue Dots	75 SF	Non-Friable
	Classroom Sink	10 SF	Non-Friable
	Stabilization of Paint on CMU Walls	4 SF	Minor
	Stabilization of Paint on Concrete Ceiling	10 SF	
Rooms 102, 103, 104, 105, 107, and 109	Paint on CMU Walls and Concrete Ceilings (Coring and drilling locations to be determined)	TBD (~100 EA)	Incidentals

### **I.3 PRE-PROJECT MEETING AND SUBMITTALS**

- I.3.1 Prior to the start of any work, the Contractor shall attend a pre-project meeting scheduled by the Owner. This is an organizational meeting to review responsibilities and personnel assignments, and to locate the containment and decontamination areas and temporary facilities including power, light, water, etc.
- I.3.2 The Contractor, Owner, Owner's Representative and other entities concerned with the overall project shall attend the meeting at project site.
- I.3.3 A week advance notice of the meeting shall be provided to all participants.
- I.3.4 At this meeting, the Contractor shall present three (3) indexed and bound copies of the following information.
  - a. Philadelphia Contractor License
  - b. Insurance Certificates
  - c. Notifications to Governmental Agencies
  - d. Permits
  - e. Designation of Competent Person (s)
  - f. Identification of Registered Waste Hauler(s)
  - g. List of Subcontractors
  - h. Identify the sealant to be utilized, including manufacture literature.
  - i. Safety data sheets (SDS) on all products and materials to utilized by the Contractor prior to start of project.
  - j. Identify all equipment to be utilized during the Project including manufacturer's literature and certification, if appropriate.



## **I.4 WORK SEQUENCING**

- I.4.1 Install a decontamination unit as specified.
- I.4.2 Install a sufficient number of air filtration devices to provide for the required air changes per hour.
- I.4.3 Install, at the decontamination unit, a digital, negative pressure differential monitor with continuous print-out at all air make-up locations and maintain pressure differential of -0.02”w.c.
- I.4.4 Install critical and containment barriers as specified.
- I.4.5 Pre-clean designated work area as per Specification.
- I.4.6 Install 6-mil polyethylene sheeting on all floors and walls.
- I.4.7 Ensure electric inside the work area is off or is GFI protected.
- I.4.8 Following authorization and written permission to proceed from site API, perform asbestos removal activities.
- I.4.9 Apply a low fine pressure spray of amended water to all asbestos containing materials designated for removal and re-wet as necessary. Ensure the ACMs are adequately wet throughout all work including final disposal.
- I.4.10 Remove and dispose of all designated as specified.
- I.4.11 Clean and decontaminate all exposed surfaces as specified.
- I.4.12 Apply sealant to all exposed surfaces from which ACM is removed after pre-sealant inspection by API.
- I.4.13 Following authorization and written permission to proceed from site API, perform final cleaning activities.
- I.4.14 Properly remove and dispose of all waste materials.
- I.4.15 Perform final walk-through inspection with Owner and/or Owner’s representative.

## **I.5 CONTRACTOR REQUIRED ON SITE DOCUMENTS**

- I.5.1 Proof of notification and receipt to the City of Philadelphia and Environmental Protection Agency (EPA). These notifications shall be made at least ten (10) days prior to the commencement of any on-site project activity.
- I.5.2 Proof that required permits, site locations, and arrangements for Waste Transport and Disposal have been made.
- I.5.3 Documentation that the Contractor's employees, including Supervisors, and Workers are properly licensed by State of Pennsylvania and have received the proper Medical surveillance including the Physicians "Certification of Fitness" to both wear a respirator and conduct the required work place activities, and have been properly fitted for respiratory protection.
- I.5.4 Documentation and Certification from the manufacturers that the HEPA Filters, Vacuums, and Ventilation units conform to ANSI A9.2-79.
- I.5.5 Document NIOSH/MSHA approvals for all respiratory protective devices utilized on-site including manufacturing certification that the HEPA filters are approved including their certification numbers.
- I.5.6 Define the security system, warning signs, and labels for waste bags and debris.
- I.5.7 A detailed Fire and Emergency Evacuation Plan.
- I.5.8 Copies of all Safety Data Sheets (SDS) for products to be utilized during the project.
- I.5.9 Establish an approved visitors list.
- I.5.10 The contractors Daily Log Book including a review of the Project's Progress, compliance with the schedule, major problems including corrective actions, injuries, and equipment breakdown.
- I.5.11 The Waste Disposal Trip Tickets and Disposal receipts for all material removed from the Project.

- 1.5.12 The analytical results of all Personal Air Sampling conducted during the preceding week.
- 1.5.13 Daily results of the required manometers measuring the Pressure Differential of the work site.

## **1.6 PERSONNEL QUALIFICATIONS**

All personnel of the Contractor shall be trained and tested prior to any work, shall be licensed and/or certified as required by the State of Pennsylvania, and shall be thoroughly familiar with the standard operating procedures for asbestos abatement work, lead paint stabilization, and duct cleaning. All of the Contractor's personnel shall undergo the medical examinations required by OSHA and the Supervisor(s) shall be thoroughly familiar with all applicable regulations and practices. All of the Contractor's personnel shall pass the respirator fit test. Any Contractor employee without the above qualifications shall not be allowed to work at the Project Site at any time.

### **1.6.1 Contractor Supervisor Qualifications**

- 1.6.1.1 Training and knowledge of applicable regulations and expertise in safety and environmental protection as evidenced by the participation in, successful completion of, and certification by an approved Supervisor's course.
- 1.6.1.2 Shall be fluent in English and must speak the language of all of the employees or have designated interpreters on each shift.

### **1.6.2 Contractor Worker Qualifications**

- 1.6.2.1 Training as evidenced by the participation in, successful completion of, and certification by an approved asbestos workers courses from the Pennsylvania Department of Labor and Industry.
- 1.6.2.2 Familiarization with the standard operating procedures for asbestos abatement work.
- 1.6.2.3 Skills and experience with abatement work as evidenced through participation or training on abatement projects similar in size and scope.

**I.7 THE CONTRACTOR SUPERVISOR SHALL:**

- a. Maintain a permanently bound project log book, which will include:
  1. Identify the facility, Owner, agent, and the project.
  2. Define each work area.
  3. Record completely all-pertinent facts.
  4. Record date, time and name after each entry.
  5. Have a daily sign-in for each and every individual crossing into the work area. They must provide, in legible print, name (first and last), worker license number, the time and date entered and exited or proof of approved visitor status.
  6. Dates of inspections and documentation of passing.
  7. A summary of work accomplished at the end of each shift.
  8. Notes and inspections.
- b. Shall see that the Decontamination Chambers are kept clean.
- c. Shall ensure that sufficient Personal Protective Equipment (PPE) is stored in the Clean Room.
- d. Shall survey the work area a minimum of two (2) times per shift for proper housekeeping, safety precautions and barrier integrity. Shall record objective observations.
- e. Shall ensure that workers are wearing proper personal protective equipment and are trained in its use, and shall instruct workers on evacuation procedures.
- f. Shall ensure that all workers are certified and licensed.

## **I.8 RESPIRATORY PROTECTION REQUIREMENTS**

- I.8.1 Respiratory protection shall be worn by all individuals inside the work area.
- I.8.2 All respiratory protection shall be MSHA/NIOSH approved in accordance with the provisions of 30 CFR Part II. All respiratory protection shall be provided to the employees and used in conjunction with the Contractors written Respiratory Protection Program.
- I.8.3 The minimum respiratory protection required will be Half Face Air Purifying Respirators equipped with HEPA filters.
- I.8.4 The workers shall be provided with personally issued and individually marked respirators. Respirators shall not be marked with any equipment that will alter the fit of the respirator.
- I.8.5 Respiratory Protection shall be inspected and decontaminated on a daily basis in accordance with OSHA CFR 1910.134.
- I.8.6 Respiratory protection shall be the last piece of worker protection equipment to be removed. When exiting the work area workers must wear their respirators in the shower while going through the decontamination procedures described in this Specification and within other applicable standards regulations.
- I.8.7 Respirators shall be stored in a dry place and in such a manner that the face piece and exhalation valves are not distorted.
- I.8.8 Authorized visitors shall be provided with suitable respirators and instruction on its proper use whenever entering the work area.

## **I.9 PERSONAL PROTECTIVE EQUIPMENT**

- I.9.1 The Contractor shall provide Protective Clothing to be worn by all individuals inside the work area.
- I.9.2 Disposable Clothing shall include head, foot, and full body protection. These shall be provided in sufficient quantities and sizes for all workers and authorized visitors.

- 1.9.3 Hard hats, protective eye wear, gloves, rubber boots, and/or other footwear shall be provided and worn by all workers and authorized visitors. Safety shoes and hard hats shall be in accordance with ANSI/ISEA Z89.1 (2014) and ASTM F2412 and 2413.
- 1.9.4 Non-disposable clothing should not be used as a means of personal protective equipment.
- 1.9.5 Contaminated clothing shall be sealed in impermeable labeled bags and disposed of properly.

#### **1.10 PERSONAL EXPOSURE MONITORING**

- 1.10.1 The Contractor shall conduct air monitoring on a daily basis per OSHA Regulation 1926.1101 (including Appendix A) including full shift personal time weighted average monitoring (unless Type C respirators are utilized).
- 1.10.2 Daily monitoring shall commence from the time the regulated area is established and continue until satisfactory post test air samples are achieved.
- 1.10.3 Continuous monitoring and inspection will include work area samples and personnel samples from the breathing zone of a worker to accurately determine the employees 8-hour TWA for all job tasks.
- 1.10.4 Work area samples and employee personnel samples shall be taken using pumps whose flow rates can be determined to an accuracy of +5% at a rate of 2 liters per minute. This must be demonstrated at the job site.
- 1.10.5 Sampling and analysis methods shall be as per NIOSH 7400.
- 1.10.6 Air sample results shall be verbal to all on-site personnel and written results delivered to the job site and posted within 48 hours. These may be handwritten. A Chain of Custody record shall accompany the written results.

#### **1.11 EMERGENCY PRECAUTION AND PLANNING**

- 1.11.1 The work area is to be restricted to allow only authorized, licensed, trained, and protected personnel. These may include the Contractor employees, employees of approved Subcontractors, Owner employees and representatives, State and

local inspectors, and any other designated individuals. A list of authorized personnel shall be established prior to job start and posted in the Clean Room of the Contractor's Worker Decontamination Facility.

- 1.11.2 Entry into the work area by unauthorized individuals shall be reported to the API by the Contractor Supervisor.
- 1.11.3 A log book shall be maintained in the Clean Room Area of the Worker Decontamination System, or at a similar convenient location. Anyone who enters the work area must record name, affiliation, time in, and time out for each entry.
- 1.11.4 Access to the work area shall be through a single Worker Decontamination system. All other means of access (doors, windows, hallways, etc.) shall be blocked or locked so as to prevent entry to or exit from the work area. The only exception for this rule is emergency exits in case of fire or accident. Emergency exits shall be sealed with polyethylene sheeting and tape until needed.
- 1.11.5 The Contractor shall have control of site security during all operations whenever possible, in order to protect work efforts and equipment.
- 1.11.6 Emergency procedures shall be in written form and prominently posted in the Clean Change Area and Equipment Room of the Worker Decontamination facility and at other appropriate locations. Everyone prior to entering the work area must read and sign these procedures to acknowledge receipt and understanding of work site layout, location of emergency exits and emergency procedures.
- 1.11.7 Emergency planning shall include written notification to police, fire, and emergency medical personnel of planned abatement activities, work schedule, and layout of work area, particularly barriers that may affect response capabilities.
- 1.11.8 Emergency planning shall include considerations of fire, explosion, toxic atmospheres, electrical hazards, slips, trip, and falls, confined spaces and heat related injury. Written procedures shall be developed and employee training in procedures shall be provided.



- 1.11.9 Contractor will be required to have available on site a first-aid kit and a sufficient supply of fire extinguishers.
- 1.11.10 Employees shall be trained in evacuation procedures in the event of work place emergencies.
  - a. For non-life threatening situations, follow normal procedures with assistance from fellow workers if necessary before exiting the work area to obtain proper medical treatment.
  - b. For life-threatening injury or illness, worker decontamination shall take least priority. After measures to stabilize the injured worker, remove him from the work area and secure proper medical treatment.
  - c. Telephone numbers of all emergency response personnel shall be prominently posted in the Clean Change Area and Equipment Room, along with the location of the nearest telephone.

## **1.12 FIRE-PROTECTION**

- 1.12.1 The Contractor will comply with all local fire safety, regulations, rules and standards.
- 1.12.2 The Contractor will ensure that required exits from the work area are not impaired and fire watches are set where necessary.
- 1.12.3 The Contractor shall meet any recommendations for job site safety as may be required by the Owner and/or Fire Safety Representative.
- 1.12.4 Exits from the work areas, or alternative exits, will be established in accordance with applicable code(s) and regulations. Exits will be checked for exterior blockage or impediments to exiting.
- 1.12.5 Work area barriers, etc. will be clearly marked with information.
- 1.12.6 A detailed drawing of all barrier locations, including type of materials used to construct barriers, shall be provided to the Owner and Fire Safety Representative prior to the start of asbestos-related activity.



### **I.13 MATERIALS AND EQUIPMENT**

- I.13.1 All materials subject to damage will be stored off the ground, away from wet or damp surfaces, and under protective cover to prevent damage or contamination. Replacement materials will be stored outside of the work area until abatement is completed.
- I.13.2 Damaged and deteriorating materials will not be used.
- I.13.3 Fire resistant plastic (polyethylene sheeting, or spray-plastics) of 6-mil thickness or greater in sizes to minimize the frequency of joints, shall be employed for containment.
- I.13.4 Ptak poly tape or equivalent will be capable of sealing joints or adjacent sheets of plastic, facilitating attachment of plastic sheets to finished or unfinished surfaces of dissimilar materials, and adhering under both dry and wet conditions, including during the use of amended water.
- I.13.5 Spray adhesive will be capable of providing additional sealing of joints and facilitating attachment of plastic sheeting to finished or unfinished surfaces where needed. Adhesive shall be capable of adhering under dry and wet conditions, including during the use of amended water.
- I.13.6 The sealant utilized will be EPA approved, or equivalent, and be of the penetrating type. The sealant will be sprayed on by means of an airless sprayer.
- I.13.7 The surfactant will be non toxic, non-carcinogenic, and not an eye, respiratory system, or skin irritant.
- I.13.8 Airtight and watertight containers will be provided to receive and retain any asbestos or lead containing or contaminated materials for storage until disposal at a disposal site. The containers shall be labeled in accordance with OSHA Regulation 29 CFR 1926.58. Plastic bags used for waste storage or disposal shall be clear, 6-mil in thickness minimum, and be marked with caution labels in accordance with OSHA regulation 29 CFR 1926.58 (g) and the ACR.
- I.13.9 Adequate HEPA filter equipped ventilation units, including HEPA filter replacements, will be provided.

- 1.13.10 All tools, respirators, and filter replacements necessary will be provided.
- 1.13.11 All necessary water filtration units will be provided, this will include a 5 micron final filter for waste water.
- 1.13.12 The Contractor will have available ladders and/or scaffolds of sufficient dimension and quantity so all work surfaces can be easily and safely reached by workers. Scaffold joints and ends will be sealed with tape to prevent incursion of asbestos fibers. Scaffolding will comply with the Building Code and OSHA requirements.

#### **I.14 USE OF SITE/UTILITY REQUIREMENTS**

- 1.14.1 The Contractor shall assure emergency escape routes are established, in case of fire or other emergencies. The Contractor shall install appropriate safety barriers and notices at the perimeter of work and maintain the same during the course of work to prevent site access from unauthorized personnel.
- 1.14.2 Use of temporary electrical power is available at the site, extension to the point of source is the responsibility of the Contractor.
  - a. The Contractor shall provide receptacle outlets equipped with GFI, reset button, and pilot light for plug-in connection of power tools and equipment.
  - b. The Contractor shall use only grounded extension cords and shall use hard service cords where exposed to abrasion and traffic. Contractor shall use lengths or use waterproof connectors to connect separate lengths of electric cords, if single lengths will not reach areas of work.
- 1.14.3 The Contractor shall install sufficient temporary lighting to ensure proper workmanship throughout the project by combined use of daylight, general lighting, and portable plug-in task lighting.
- 1.14.4 Use of water is available at the site, extension to the point of source is the responsibility of the Contractor. The Contractor shall provide a temporary hot water heater for decontamination usage. Provide hot and cold water as required to the decontamination unit.

- a. The Contractor shall maintain all temporary water connections, hoses and outlet valves in a leak proof condition throughout the project. Replace any leaking hoses and connections immediately upon discovery.
- b. Where hot water is required, the Contractor shall provide a supply with a minimum temperature of 100 degrees Fahrenheit.

### **I.15 APPLICABLE PUBLICATIONS**

The publications listed below form a part of Standard Operating Procedure. The publications are referenced in text by basic designation only.

- United States Department of Labor - OSHA. Regulation 1926.1101. Asbestos.
- United States Department of Labor. OSHA Safety and Health Standards (20 CFR 1926/1910). Construction industry (Most Current Edition).
- U.S. Environmental Protection Agency. 40 CFR Part 61, Parts A and M, and Revised Subpart B: National Emission Standard for Asbestos, Asbestos Stripping, Work Practices, and Disposal of Asbestos Waste.
- U.S. Environmental Protection Agency. Guidance for Controlling Asbestos -Containing Materials in Buildings. (EPA 560/5-85-024. June 1985, and EPA 560/5-83-002 March 1983).
- U.S. Environmental Protection Agency. Asbestos-Containing Materials in School Buildings: A Guidance Document. (C0009 March 1979 Parts 1 & 2).
- 49 CFR Parts 171 and 172 - Hazardous Substances
- Asbestos Control Regulations (ACR), Requirements of Chapter 6-600 of the Health Code, City Council Bill 760 A, amendments contained in Bill 141, 6/30/89 and as amended 7-20-09. This includes any additional amendments or directives to the Asbestos Control Regulations prior to the start of this project.
- Asbestos Occupations Accreditation and Certification Act, Act No. 194 and amendments contained in Act No. 161 (12/21/98). This includes any amendments or directives to the Asbestos Occupations Accreditation and Certification Act prior to the start of this project.



- National Air Duct Cleaners Association (NADCA): “General Specification for the cleaning of commercial HVAC Systems”.
- National Air Duct Cleaners Association (NADCA): “Introduction to HVAC System Cleaning Services,” 2004.
- Underwriters’ Laboratories (UL): UL Standard 181.
- American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE): Standard 62-89, "Ventilation for Acceptable Indoor Air Quality".
- Environmental Protection Agency (EPA): "Building Air Quality," December 1991.
- Sheet Metal and Air Conditioning Contractors' National Association (SMACNA): “HVAC Duct Construction Standards - Metal and Flexible,” 2006.
- North American Insulation Manufacturers Association (NAIMA): "Cleaning Fibrous Glass Insulated Air Duct Systems," 1993.

## **I.16 DEFINITIONS AND STANDARDS**

- I.16.1 These Specifications are based on current, applicable state and local regulations and requirements. The Contractor shall be informed of the requirements of the Agencies’ Regulations and shall satisfy the Specifications and all referenced regulations as may be amended by said Agencies during the course of this work.
- I.16.2. The Contractor shall comply with all federal regulations (i.e., the United States Department of Labor, Occupational Safety and Health Administration (OSHA) regulations), including but not limited to:
- a. Respiratory Protection, Title 29, Part 1910, Section 134 of the Code of Federal Regulations.
  - b. Construction Industry, Title 29, Part 1926, of the Code of Federal Regulations.
  - c. EPA Asbestos Hazard Emergency Response Act (AHERA) and OSHA 1926.1101 Asbestos Standard.
  - d. Hazard Communication, Title 29, Part 1910, Section 1200 of the Code of Federal Regulations.

e. Specifications for Accident Prevention Signs and Tags, Title 29, Part 1910, Section 145 of the Code of Federal Regulations.

I.16.3 The Contractor shall comply with all state regulations including but not limited to the PA Department of Labor and Industry, Asbestos Occupations, Accreditation and Certification Act, and City of Philadelphia Asbestos Control Regulations.

I.16.4 Local Requirements: Abide by all local requirements governing demolition work or hauling and disposal of waste materials.

I.16.5 Definitions

**Abatement:** The process or procedure for removing, sanitizing, and controlling the biological release and/or dispersion of infectious agents.

**Adequately Wetted:** Sufficiently wet, mixed or coated with a solution of a biocide to prevent biological and dust dispersion during the movement of contaminated items and debris.

**Air Filtration Device:** A local exhaust HEPA equipped air filtration device capable of maintaining a negative pressure inside the work area and a constant air flow from adjacent areas into the work area exhausting clean filtered air outside the work zone.

**Air Testing:** The process of measuring inside biological contamination and outside ambient conditions.

**Authorized Personnel:** Building Owner or Owner's representative, and all other personnel who are authorized officials of any regulating agency, be it state, local, federal or private entity who possess legal authority for enforcement or inspection of the abatement work.

**Barrier:** Any surface which seals off the work area to inhibit the movement of infectious biological agents and contamination.



Breathing Zone:	A zone forward of the shoulders and head with a radius of approximately 6 to 9 inches, which is the approximate area from which an individual would obtain their air for breathing purposes.
Clearance Criteria:	Air testing clearance criteria shall be performed in accordance with the City of Philadelphia Asbestos Control Regulation (ACR) and the Asbestos Hazard Emergency Response Act (AHERA).
Construction Barrier:	Used for construction separation only. Does not prevent movement of infectious biological contaminants. Construction barriers shall be constructed of ½ inch plywood and 2 x 4 inch studding spaced no greater than 24" o/c. Doorways (minimum), 3 ft. x 6 ft. shall be installed where required for ingress and egress. A lock shall be installed to secure the area when the Contractor is not on site.
Contracting Authority:	School District of Philadelphia
Contractor:	The Abatement Contractor who has demonstrated proficiency in the clean-up of regulated chemical or physical substances, proficient in environmental remediation and the clean-up of contaminated debris and/or infectious biological agents.
Critical Barrier:	Two (2) layers of six (6) mil polyethylene sheeting, adhered in such a fashion that each layer is individually visible, and completely seals off the work area to prevent the distribution of infectious biological agents into the surrounding areas that are not part of the work zone.
Decontamination Unit:	A serial arrangement of rooms or spaces for the purpose of separating work area from the building environment. This unit provides for entering the work site, returning to the clean environment, cleansing of persons, equipment, and movement of properly contained waste material.
Disposal Bag:	A minimum 6 mil thick, leak tight clear plastic bag used for packaging and transporting debris and biological waste from



the work zone to a disposal site. Where required, these bags shall have affixed appropriate warning labels and site specific waste generator labels.

Facility:	Any institutional, commercial or industrial structure, installation or building.
Facility Component:	Any building component, such as, but not limited to: structural steel, steel decking, ceiling grid, block and brick, floors, walls, ceilings, bar joists, light fixtures, ceiling hangers, studs, plates, insulation, and all other vertical and horizontal surfaces.
Fixed Object:	Mechanical equipment, electrical equipment, fire detection systems, alarms, and all other fixed equipment, furniture, fixtures or other items which cannot be removed from the work area.
HEPA:	High Efficiency Particulate Absolute filtration efficiency of 99.97% down to 0.3 microns. Filtration provided on specialized vacuums and air filtration devices to trap particles and infectious agents.
HVAC:	Heating, ventilation, and air conditioning system.
Movable Object:	Equipment, furniture or other items in the work area which can be removed from the work area.
Negative Pressure:	A system established for the work zone utilizing HEPA filtration ventilation system capable of maintaining a negative pressure inside the work area and which creates a constant air flow from adjacent areas into work area and exhausts clean filtered air outside the work zone. Maintain a minimum of one (1) complete air change every 15 minutes and -0.02 inches of water column pressure differential from the surrounding area
Owner:	School District of Philadelphia
Respirator:	Device designed to protect the wearer from the inhalation of harmful respirable dust, fumes, mists and infectious biological agents.



- Separation Barrier:** Used for isolating contaminated work areas from non-contaminated occupied areas. Separation barriers shall be constructed of ½ inch plywood and 2 x 4 inch studding spaced no greater than 16” o.c. with two (2) layers of 6 mil fire resistant polyethylene installed on both sides. A (minimum), 3 ft. x 6 ft. emergency escape kick-out panel shall be cut and secured into place with Ptak tape where required for emergency egress. This exit shall be clearly marked from the work area side and indicated on the emergency route document posted at the entrance to the work area.
- Staging Area:** Site where Contractor maintains waste transfer airlock, where containerized waste has been placed, an outside site of material storage, equipment storage, construction trailer, etc. These areas are off limits to unauthorized personnel and shall be clearly and visibly marked.
- Structural Member:** Any load supporting member of a facility, such as, but not limited to: beams, decking, load supporting walls or any non-load supporting member, such as: ceilings, non-load supporting walls.
- Visible Emissions:** Emissions containing particulate materials that are visually detectable without the aid of instruments.
- Waste Transfer Airlock:** A system airlock constructed in such a manner as to prevent the free flow of air to areas outside of the work area and utilized for transferring containerized waste from inside to outside the work area. The system shall be checked prior to use for negative air flow.
- Water Column (w.c.):** Means a unit of measurement for pressure differential expressed in inches of water column. Maintain -0.02 inches of w.c. in unoccupied facilities.
- Wet Biocide Cleaning:** The process of eliminating biological contamination from building surfaces and objects by using cloths, mops, or other cleaning devices which have been dampened with a biocide.







7. NIOSH National Institute for Occupational Safety and Health  
1090 Tusculum Ave  
Cincinnati OH 45226  
513-844-4382  
[www.CDC.gov/NIOSH](http://www.CDC.gov/NIOSH)
  
8. OSHA Occupational Safety and Health Administration  
200 Constitution Avenue, NW  
Washington, D.C. 20210  
800-321-6742  
[www.OSHA.gov](http://www.OSHA.gov)

**END OF SECTION**

## **2.0 ASBESTOS ABATEMENT PROCEDURES**

### **2.1 GENERAL ABATEMENT REQUIREMENTS**

- 2.1.1 All work shall be conducted in strict accordance with the City of Philadelphia Asbestos Control Regulation (ACR) and all applicable federal, state, and local regulations. All provisions in the ACR et seq. shall apply to work performed on this project.
- 2.1.2 The Contractor shall provide a “competent person” on-site at all times, in accordance with OSHA Regulations, and shall maintain the necessary staffing to complete the project in accordance with the project schedule. The competent person shall have knowledge in construction and be knowledgeable in reading and interpreting construction documents.
- 2.1.3 The Contractor shall perform all work in a professional manner and shall ensure maximum protection is provided to the workers, building occupants, and the building environment.
- 2.1.4 The Contractor shall provide all equipment, scaffolding, tolls, wooden studs, plywood and other materials necessary to complete the work as specified, and shall promptly remove all equipment, debris, surplus material, etc. upon completion of work.
- 2.1.5 The Contractor shall protect non-affected and non-moveable fixtures, such as; electrical panels, outlets, switches, lights, motors, controls, gauges, etc., in or near the work area against damage and/or contamination.
- 2.1.6 As required by the ACR, all HVAC and electrical systems within the work area shall be shut down during abatement activity. All the above systems shall remain shut down until after final clearance testing and satisfactory analytical results are obtained and a written permission to break down the containment is obtained from the API.
- 2.1.7 All electrical connections to electrical panels and/or any wiring installed other than extension wires shall be performed by a licensed electrician. All power to work areas shall be brought in from outside the work area through ground fault interrupters at the source. The Contractor shall be responsible for coordination

with the API and facility personnel pertaining to electrical requirements for this project and shall ensure the power supply is safe and adequate for all facets of the project, including temporary lighting for all work areas and air monitoring requirements of the API.

- 2.1.8 The Contractor shall ensure adequate water pressure and delivery to all areas of abatement are provided to the satisfaction of the API.
- 2.1.9 The Contractor shall install supporting structures as necessary to ensure separation barriers integrity is maintained throughout abatement activity. Damage and defects to the separation barriers shall be repaired immediately upon discovery.
- 2.1.10 Provide and install sufficient negative air filtration devices (AFDs) to supply the abatement work area with four (4) air changes per hour. The Contractor shall prepare a written calculation of the work area volume establishing the required number of AFDs to achieve four (4) air changes and shall present same to the API. This document shall be submitted for approval prior to the pre-commencement inspection.
- 2.1.11 AFD units shall be exhausted to the exterior of the building. Under no condition will the exhaust be permitted within the building unless authorized in writing by the API.
- 2.1.12 Provide and install a digital manometer for the work area that provides a 24 hour a day, continuous strip chart record at the decontamination unit ingress/egress, so as to continuously monitor and record the air pressure differential between the interior of the containment area and the outside clean area. The exhaust capacity from the work area shall be sufficient to establish and maintain a pressure differential greater than or equal to -0.02 inches of w.c. The Contractor's Supervisor shall be qualified and proficient in both the operation of the manometer unit and in calculating to determine the number of AFD's necessary to achieve and maintain the required -0.02" of w.c. for the work area. The Contractor shall ensure the manometer(s) remains functional at all times, including the calibration at the beginning of each shift with manometer(s) having sufficient tape and ink to carry-over into the next workday. During work, manometer(s) shall be zero calibrated every four (4) hours by the Contractor's Supervisor.

- 2.1.13 The Contractor shall provide HEPA, secondary, and pre-filters for all AFD's, HEPA filters shall not have more than 500 hours of use. The pre-filter shall be changed whenever deemed necessary by the API. A sufficient number of AFD's shall be used to meet Specification requirements. The Contractor shall have a backup unit available on site at all times in the event an on-line AFD is found to malfunction.
- 2.1.14 The Contractor is responsible for operation and maintenance of the AFD unit(s) and components. The flex tubes shall be securely affixed and sealed at the AFD and exhaust ports. The units shall be placed in the work area at locations indicated in the sketch or as approved on-site by the API.
- 2.1.15 All asbestos waste bags and packages shall be labeled with the prescribed federal OSHA warning signs and shall include site-specific waste generator information.
- 2.1.16 The Contractor shall provide a fully enclosed, watertight waste container complete with a locking device for storage of all contaminated waste removed from the site. The waste container shall have asbestos warning signs affixed to all sides and doors. A perimeter warning band shall be placed near the container location and the exterior route of travel during waste transfer activities.
- 2.1.17 The Contractor shall coordinate the removal of waste immediately upon completion of the project. No payment shall be made to the Contractor until all contaminated waste has been removed from the site and a waste manifest signed by the proper authority is submitted to the Owner.
- 2.1.18 Asbestos waste that may puncture or tear waste bags, and which is required to be bagged for disposal, shall be placed in cardboard boxes, burlap or nylon sacks, or other protective covering, prior to bagging, as necessary to ensure that bags are not punctured or torn during the disposal process. Items large for standard bagging shall be wrapped in two (2) layers of six (6) mil polyethylene sheeting and sealed with Ptak tape. All asbestos waste shall be packaged and disposed in accordance with all applicable local, state, and federal regulations and ordinances.
- 2.1.19 All workers shall wear protective clothing and respirators, in accordance with standards set forth in 29 CFR 1926.1101((g) and (h) and (I), for all asbestos removal activity. The Contractor shall provide shower equipped decontamination facilities in accordance with 29 CFR 1926.1101 and these Specifications.

- 2.1.20 No asbestos containing material shall be disturbed during preparation activity. Exception: Asbestos material required to be cleaned up to complete preparation shall be treated first with an amended water solution and removed in a manner designed to limit or prevent fiber release to the environment. All procedures and the amount of material to be removed must be approved in writing by the API before work begins.
- 2.1.21 The Contractor shall post appropriate warning signs on all exterior doors of the building.
- 2.1.22 Shower water shall be collected and disposed as contaminated waste material. No wastewater shall be disposed in a sanitary drain unless written permission is obtained from the local treatment facility and the API and then appropriately filtered through five (5) micron filters prior to disposal.
- 2.1.23 The Contractor shall provide for clearly marked emergency means of egress for the work areas specified. Asbestos warning signs shall be posted on all abatement area entry doors prior to the commencement of the project. These notifications shall be placed at eye level and in languages consistent with the building population.
- 2.1.24 The Contractor shall be liable for all costs associated with the replacement or repair of any utilities, equipment, materials, building components, etc., that may be damaged during the course of Contractor work.
- 2.1.25 Work area barriers, decontamination unit, and negative air pressure systems shall remain operational until final air tests indicate acceptable clearance criteria and written authorization to disassemble the containment structure is obtained from the on-site API.
- 2.1.26 All in field decisions with respect to compliance with these Specifications or applicable regulations shall be at the discretion for the API.

## **2.2 CRITICAL BARRIERS**

- 2.2.1 Completely isolate the work area from uncontaminated areas and the outside by sealing all windows, doorways, elevator openings, skylights, corridor entrances, floor and sink drains, air ducts, grills, grates, and diffusers with 2 layers of 6 mil plastic sheeting taped securely in place or stapled or fastened by spray-on

adhesives, glue beads, or horizontal wood battens or the equivalent. Floor drains shall be sealed individually and then covered as all other floor surfaces with two thicknesses of 6 mil plastic sheeting. All furnishings, cabinets (floor and wall) etc. remaining in the work area shall be sealed with two layers of plastic sheeting.

- 2.2.2 All existing doors shall be closed and secured by duct taping on all spaces and gaps between the door and door frame. Two (2) layers of 6 mil polyethylene sheeting shall be applied over the door and frame on the work area side. Two (2) layers of 6 mil polyethylene sheeting shall also be applied to the clean side of the door and frame.
- 2.2.3 Where solid critical barriers are required, the contractor shall construct a critical barrier constructed of 2" x 4" wood studs at 16" O.C. with 3/8" plywood sheeting on each side. Critical barrier shall have all seams caulked and shall receive two (2) layers of polyethylene sheeting as described herein.
- 2.2.2 Attention shall be given to pipe chases, utility access, and other openings between areas so that no migration of fibers will occur. Closing of all gaps shall be accomplished by application of fire rated expandable foam. If during removal activities, any leakages are detected, the Contractor shall stop operations and reapply sealant materials.
- 2.2.3 Mechanically support each plastic layer independently with Ptak tape or spray adhesive seals so that seals do not support the weight of the plastic.

### **2.3 ENGINEERING AND EXPOSURE CONTROLS**

- 2.3.1 The Contractor shall provide localized ventilation of the general work area using negative air filtration machines equipped with HEPA filters. The exhaust from the units will discharge to the exterior of the building via flexible duct. Plywood manifolds will need to be installed within the door and/or window openings to hold the exhaust ducts in place.
- 2.3.2 At no time will the exhaust from the negative pressure ventilation units be within 40 feet of a receptor or adversely affect the air intake ports, louvers, or entrances for the building or adjacent buildings.
- 2.3.3 In the event of an electric power failure, all work will stop immediately, and shall not resume until power is restored and exhaust units are operating again.

2.3.4 All HEPA filter ventilation units shall be in compliance with ANSI Z9.2 (2018), Local Exhaust Ventilation.

## **2.4 PROTECTION OF BUILDING SYSTEMS**

2.4.1 The Owner shall disable ventilating systems or any other system bringing air into or out of the Work Area. Disable system by disconnecting wires, removing circuit breakers, by lockable switch, or other positive means that will prevent accidental premature restarting of equipment.

2.4.2 The Owner shall lockout power to Work Area by switching off all breakers serving power or lighting circuits in work area. Label breakers with tape over breaker with notation "DANGER circuit being worked on". Lock panel and have all keys under control of Contractor's Superintendent or Owner's designated Representative.

2.4.3 The owner shall lockout power to circuits running through work area wherever possible by switching off all breakers or removing fuses serving these circuits. Label breakers with tape over breaker with notation "DANGER circuit being worked on". Lock panel and have all keys under control of contractor's superintendent or owner's designated representative. If circuits cannot be shut down for any reason, label at intervals 4'-0" on center with tags reading, "DANGER live electrical circuit. Electrocution hazard." Label circuits in hidden locations but which may be affected by the work in a similar manner.

## **2.5 DISPOSAL AND WASTE REQUIREMENTS**

2.5.1 The Contractor will maintain compliance with the strictest set of applicable regulations.

2.5.2 When presenting waste for storage at the generation site, The Contractor will:

- a. Wet down waste in a manner sufficient to prevent all visible emissions of dust into the air.
- b. Seal material in a leak tight container while wet.
- c. Keep asbestos separate from non-asbestos waste.



2.5.3 When presenting waste for storage away from the site of generation, the contractor will:

- a. Ensure waste has been properly packaged as per requirements above.
- b. Examine the containers of waste to ensure that there are no breaks in the containers and that no visible dusts are being released into the air. The examination will be conducted in a manner reasonably calculated to minimize disturbance and damage to the container.
- c. If examination reveals damage to a container of waste, the Contractor or person accepting waste will immediately wet down the waste and re-package it into a clean leak minimize potential exposure to the general public.
- d. Keep waste separate from any other waste.

2.5.4 When storing waste the Contractor will:

- a. Ensure waste has been sufficiently wetted down in a leak tight container.
- b. Examine the integrity of the container's leak tight seal at a minimum of once per 24 hour period.
- c. Re-wet and repackage any damaged containers.
- d. Maintain at storage site an adequate supply of spare leak tight containers.
- e. Keep waste separate from any other waste.
- f. Keep waste in a secured enclosed and locked container.

2.5.5 When presenting waste for transport, the Contractor will:

- a. Ensure waste has been sufficiently wetted.
- b. Examine the integrity of the container's airtight seal.
- c. Re-wet and re-package any damaged containers.

- d. Keep waste separate from all other wastes.
- e. Ensure that the person transporting the asbestos waste holds a valid permit issued pursuant to law.

2.5.6 When transporting waste, the transporter will:

- a. Ensure waste has been sufficiently wetted down in a leak tight container.
- b. Examine the integrity of the container's leak tight seal at a minimum of once per 24 hour period.
- c. Re-wet and re-package any damaged containers.
- d. Maintain at the storage site an adequate supply of spare leak tight containers.
- e. Maintain at storage site an adequate supply of amended water.
- f. Keep waste separate from any other waste.
- g. Keep waste in a secured, enclosed, and locked container.

2.5.7 When waste is presented for disposal:

- a. The approved waste hauler will comply with all applicable orders issued pursuant to asbestos disposal.
- b. Ensure waste has been sufficiently wetted down.
- c. Examine the integrity of the container's air tight seal.
- d. Re-wet and re-package any damaged containers.
- e. Keep waste separate from all other wastes.

2.5.8 Disposal shall be at an approved landfill and a manifest form (NESHAP Form minimum) will be signed by the Landfill Owner documenting receipt and acceptance of the Asbestos Containing Waste and Lead Containing Paint that will be furnished to the Owner.

## **2.6 DECONTAMINATION FACILITIES**

The Decontamination Facilities for the abatement shall include Decontamination Units for workers and visitors and Decontamination Units for loading ACMs and lead containing paint out of the work area for transportation to the landfill. These units shall be secured by a lockable door with the appropriate louvers for make-up air into the work area.

- 2.6.1 The Decontamination Unit for workers and visitors shall consist of three (3) rooms equipped as follows: Clean Room at entrance followed by Shower Room followed by an Equipment Room leading to Work Area. The flooring of these units shall be constructed with 6-mil polyethylene sheeting.
- 2.6.2 The following information will be posted in the Clean Room.
  - a. A list of telephone numbers for local hospital, location of hospital and/or emergency squad, local fire department, the building owner (or representative) and Philadelphia Air Management Services.
  - b. A copy of all Safety Data Sheets (SDS) for hazardous chemicals used by the Contractor or their subcontractors during the asbestos project.
- 2.6.3 Uncontaminated, disposable protective clothing and equipment will be provided in the same room. This room shall be used by workers and visitors to change from street clothes to disposable protective clothing and gear prior to entering into the contaminated area and to dress into street clothing after they exit from the shower area.
- 2.6.4 A pass through shower facility with hot and cold water so arranged as to provide complete showering of workers and visitors as they exit from the contaminated area shall be provided. Provisions to prevent contaminated water run-off from the Shower Room will be made. The Shower Room facilities and size shall be adequate to allow decontamination and thorough washing of all workers and visitors within any escape time needed.
- 2.6.5 There shall be one (1) shower per 8 full-shift workers calculated on the basis of the largest shift.
- 2.6.6 The Contractor will provide an Equipment Room with storage for contaminated clothing and equipment. In this room, workers and visitors will dispose of their

disposable protective clothing, except the Respirator, as they prepare to enter the Shower Room.

- 2.6.7 The Bag Wash and Wipe Room shall be equipped with facilities to wash and wipe the outside of the Bags prior to removing them from the work area for transportation to the landfill. The Contractor will make provisions to prevent any contaminated water run-off from its Bag Wash and Wipe Room.
- 2.6.8 Ventilation in the Decontamination System will be so that airflow will be from the outside towards workspace.
- 2.6.9 All water utilized during this project and contaminated by asbestos shall be filtered. The final filter will be of a 5-micron size. A system containing a series of several filters with progressively smaller pore sizes shall be used to avoid rapid clogging of the filtration system by large particles. Filtered wastewater shall be discharge to a sanitary sewer. Used filters shall be disposed of as ACW.

## **2.7 WORK AREA ENTRY AND EXIT PROCEDURES**

- 2.7.1 Personnel Entry & Exit
  - a. All workers and authorized personnel shall enter the work area through the Worker Decontamination Enclosure System. Worker decontamination units will be provided for each work area of the facility. The decontamination unit will be constructed prior to the commencement of work on a particular floor.
  - b. All personnel, before entering the Work Area, shall read and be familiar with all posted regulations, personal protection requirements including work area entry and exit procedures and emergency procedures. A sign off sheet shall be used to acknowledge that these have been reviewed and understood by all personnel prior to entry.
  - c. All personnel shall proceed first to the Clean Room, remove all street clothes and appropriately don respiratory protection (as deemed adequate for the job conditions).



- d. Personnel wearing designated personal protective equipment shall proceed from the Clean Room through the Shower Room and Equipment Room to the main work area.
- e. While inside the work area there shall be no smoking, eating, drinking, chewing or gum or tobacco, or wearing or jewelry.
- f. Before leaving the work area, all personnel shall remove gross contamination from the outside of respirators and protective clothing by brushing and/or wet wiping procedures.
- g. Personnel shall proceed to Equipment Room where they remove all protective equipment except respirators.
- h. Still wearing Respirators, personnel shall proceed to the Shower Area, clean the outside of the Respirators and the exposed face area under running water prior to removal of respirator, then shower and shampoo to remove residual asbestos contamination. Various types of Respirators will require slight modification of these procedures.
- i. Reusable, contaminated footwear shall be stored in the Equipment Room when not in use within the work area.
- j. After showering and drying off, personnel will proceed to the Clean Room and don clean clothing.
- k. These procedures shall be posted in both Clean Room and Equipment Room.

#### 2.7.2 Equipment and Waste Decontamination Procedures

- a. Contaminated waste that has been containerized shall be transported out of the work area through the Waste Container Pass-Out Air Lock.
- b. Waste pass-out procedures shall utilize two (2) teams of workers, an "inside" team and an "outside" team.
- c. The inside team, wearing appropriate protective clothing and respirators for inside the work area, shall clean the outside, including bottoms of properly labeled containers (bags, drums, or wrapped components) using HEPA

vacuums and wet wiping techniques, and transport them into the Waste Pass-Out Area. No worker from the inside team shall further exit the work area.

- d. The outside team, wearing protective clothing and appropriately assigned respirators, shall enclose the containers in clean, labeled, 6 mil polyethylene bags or sheeting as the items' physical characteristics demand, and remove them to the waste container. No worker from the outside team shall further enter the work area to the inside.

## **2.8 BARRIER AND DECONTAMINATION FACILITIES MAINTENANCE**

- 2.8.1 Following completion of the construction of all fire-resistant polyethylene barriers and the Decontamination Facilities, the Contractor will allow overnight settling to insure the barriers will remain intact and secured to walls and fixtures before beginning actual work activities.
- 2.8.2 All polyethylene barriers inside the work area, the Worker/Waste Decontamination Facility, and at partitions constructed to isolate the work area from occupied areas, shall be inspected at least twice daily, including prior to the start of each day's abatement activities by the Project Supervisor who will document their inspections and observations in the daily project log.
- 2.8.3 The Contractor will immediately repair any damage and defects in the Enclosure System.
- 2.8.4 During the asbestos abatement phase of the project, smoke tubes shall be used to test the effectiveness of the work area barriers and the Worker and Equipment Decontamination Systems before work begins. The negative pressure ventilation units shall be checked and at least once a day thereafter until the work is completed. Results and observations shall be documented in the Contractor's Project Log book.
- 2.8.5 At any time during the activities after barriers have been erected, if visible materials are observed outside of the work area or if damage occurs to barriers, all work will stop, the barriers shall be immediately repaired, and all debris or residue shall be cleaned-up using appropriate HEPA vacuuming and wet mopping procedures.

- 2.8.6 If air samples collected outside the work area during asbestos abatement activities indicate airborne fiber concentrations greater than 0.01 f/cc or pre-measured background levels, all work will stop for inspection and repair of barriers. Cleanup of all surfaces outside the work area, using HEPA vacuums or wet cleaning techniques, may be necessary.

## 2.9 FULL CONTAINMENT PROCEDURES

- 2.9.1 Full containment procedures shall be used only for the purpose of fulfilling the conditions of Section VI of the ACR.
- 2.9.2 Install a three-stage, shower equipped decontamination unit at the exterior of the work area pursuant to City of Philadelphia Asbestos Control Regulations. Provide leak proof hot and cold-water hose connections (with back-flow protection) and a wastewater retrieval system within the decontamination unit.
- 2.9.3 Install sufficient negative air filtration devices (AFDs) to supply the abatement work area with four (4) air changes per hour.
- 2.9.4 Isolate abatement area from adjacent areas by covering openings and penetrations to non-work areas with critical barriers, as appropriate. These shall include but not be limited to: drains, doorways, windows, stairwells, pipe chases, systems, electrical shaft ways, conduit openings, hatches, etc.
- 2.9.5 Pre-clean work area. This shall include thorough wet cleaning and/or HEPA vacuuming of all surfaces to the satisfaction of the API prior to installation of isolation barriers or covering equipment, etc. within the work area.
- 2.9.6 Cover existing non-removable items and equipment with critical barriers. This shall include all HVAC system equipment and duct work not covered with material scheduled for removal, registers, lights, junction boxes, and other items/equipment above the existing ceiling.
- 2.9.7 Where required, installation of Separation Barriers shall be at the discretion of the API.
- 2.9.8 Cover Floor of Work Area with 2 individual layers of 6 mil polyethylene sheeting, the first layer of wall sheeting shall extend up the wall at least 12 inches. The second layer shall be extended up sidewalls at least 24 inches. Form a sharp right



angle bend at junction of floor and wall so that there is no radius which could be stepped on causing the wall attachment to be pulled loose. Both spray-glue and Ptak tape all seams in floor covering. Sheeting shall be sized so as to minimize the number of seams necessary. No seams shall be located at between walls and floors. Locate seams in top layer six feet from, or at right angles to, seams in bottom layer. Install sheeting so that top layer can be removed independently of bottom layer.

- 2.9.9 Cover all walls in Work Area with one layer of 6 mil polyethylene sheeting. No seams shall be located at the corners. Plastic wall coverings shall be taped first to the upper most edge of the wall and shall hang straight down.
- 2.9.10 Where no abatement of spray-on ceiling is required, cover all ceilings in Work Area with one layer of 6 mil polyethylene sheeting. No seams shall be located at the corners.
- 2.9.11 Cover scaffolding with 2 layers of 6 mil "non slip" polyethylene sheeting on 1/4" masonite, (tempered one side). Install masonite tempered side up, caulk and tape all joints on 1 layer of 3/4" T&G plywood sheathing caulk and tape all joints.
- 2.9.12 Stairs and Ramps: Do not cover stairs or ramps with unsecured sheet plastic. Where stairs or ramps are covered with plastic, provide 3/4" exterior grade plywood treads securely held in place, over plastic. Do not cover rungs or rails with any type of protective materials. Dispose of plywood treads as contaminated waste.
- 2.9.13 Repair of Damaged Polyethylene Sheeting: Remove and replace plastic sheeting which has been damaged by removal operations or where seal has failed allowing water to seep between layers. Remove affected sheeting and wipe down entire area. Install new sheet plastic only when area is completely dry.
- 2.9.14 Upon receipt of written approval of satisfactory work area preparation and pre-commencement inspection, proceed with removal of ACBM within the work area.
- 2.9.15 Remove all designated ACM from the work area as asbestos waste.
- 2.9.16 Bag and transport all ACBM from the work site in double six (6) mil polyethylene waste bags or approved impermeable packages. All ACM waste



shall be adequately wet with amended water prior to removal and throughout packaging for disposal. The surfactant used by the Contractor shall be available at all times at the work site.

- 2.9.17 Conduct final cleaning of the work area to a dust-free standard approved by the API.
- 2.9.18 Apply an approved asbestos abatement sealant to surfaces that have been abated. The sealant shall be sufficiently distinct in color to allow for the identification and shall be compatible with and not affect the adherence or performance of any replacement materials.

## **2.10 TENT PROCEDURES**

- 2.10.1 Tent procedures shall be used only for the purpose of fulfilling the conditions of Section VI.B.6. of the ACR and are limited to the removal of less than one hundred sixty (160) square feet of asbestos material.
- 2.10.2 Tent procedures shall be accomplished in a constructed or commercially available plastic tent, plasticizing and sealing all surfaces not being abated within the tent periphery forming an enclosure. The tent shall be of six (6)-mil polyvinyl chloride at a minimum, with seams heat-sealed or double folded, stapled and taped air-tight and then taped flush with the adjacent tent wall. This single use barrier that shall not be reused once dismantled or collapsed.
- 2.10.3 Asbestos workers involved in the tent procedure shall wear two (2) disposable suits, including gloves, hood and footwear, and appropriate respiratory equipment if a decontamination unit is not contiguous to the tent.
- 2.10.4 The tent shall be attached to the substrate to produce an airtight seal except for a section large enough to allow for make-up air into the tent.
- 2.10.5 A HEPA vacuum or equivalent shall be used to continuously exhaust the enclosed area as specified under Section VI.B.20. of the ACR, except the negative air pressure in subdivision b. of that section shall be tested by smoke testing. The duct shall be attached securely and airtight through the tent wall at the most remote location possible from the asbestos material to be disturbed. A minimum of two (2) volume changes per hour is required.

- 2.10.6 Removal of asbestos material shall be by wet methods in accordance with Section VI.C.2. of the ACR.
- 2.10.7 The removed asbestos material shall be carefully placed in plastic disposal bags and the bags handled in accordance with Section VI.C.7.c. of the ACR;
- 2.10.8 Upon completion of abatement, and prior to tent collapse, the enclosed substrates shall:
  - a. Be wet cleaned using clean rags, mops, or sponges;
  - b. Be permitted sufficient time to dry prior to EPA-vacuuming all substrates; and
  - c. Be encapsulated to lockdown residual asbestos.
- 2.10.9 In the event of loss of negative pressure or barrier disturbance, the tent and the enclosed substrates shall be treated according to subdivision h. above;
- 2.10.10 The outer disposable suit shall be removed and remain in the tent upon exiting. Following tent disposal and work site cleanup the workers shall immediately proceed to a shower at the work site. The inner disposable suit and respirator shall be removed in the shower after appropriate wetting. The disposable clothing shall be disposed of as asbestos waste material. The workers shall then fully and vigorously shower with supplied liquid bath soap, shampoo, and clean, dry towels.
- 2.10.11 The HEPA vacuum shall be used to filter a minimum of six (6) volume changes through the tent prior to collapse of the tent/barrier.
- 2.10.12 The tent shall be collapsed inward, enclosing the contaminated clothing.

## **2.11 GLOVEBAG PROCEDURE**

- 2.11.1 The removal of asbestos by use of the glove bag shall be limited to the removal of asbestos-containing insulation from pipe fittings, elbows, and pipe.
- 2.11.2 The preparation of the work area for glove bag removal shall include the following:
  - a. A minimum of two (2) persons are required to perform a glove bag removal project. A third person may be required to assist with supplies.



- b. All necessary materials and supplies shall be brought into the work area before any removal begins.
  
- 2.11.3 A visual inspection of the pipe where the work will be performed shall be made to determine if any damaged pipe covering (broken, lagging, hanging, etc) exists. If there is damage, the pipe shall be wrapped in polyethylene plastic and fully secured with tape. This procedure will prevent high airborne fiber concentrations from occurring during the glove bag work. Debris on the floor and other surfaces which has accumulated and contains asbestos shall be cleaned up as necessary. If the pipe is undamaged, one (1) layer of tape shall be placed around the pipe at each end of where the glove bag will be attached.
  
- 2.11.4 Slit the top of the glove bag open (if necessary) and cut down the sides to accommodate the size of the pipe about two (2) inches longer than the pipe diameter).
  
- 2.11.5 Place the necessary tools into the pouch located inside the glove bag. This will usually include the bone saw, utility knife, rags, scrub brush, wire cutters, tin snips and pre-cut wettable cloth. Cut out a donut shape in the cloth with the inner diameter of the pipe insulation being removed. Finally, cut a slit in each of the two donuts so they can be slipped around the pipe.
  
- 2.11.6 A strip of tape shall be placed along the edge of the open top slit of the glove bag for reinforcement.
  
- 2.11.7 Place the glove bag around the section of pipe to be worked on and staple the top together through the reinforcing tape. Staple at intervals of approximately one (1) inch. Next, fold the stapled top flap back and tape it down. This should provide an adequate seal along the top. Next, tape the ends of the glove bag to the pipe itself, previously covered with plastic or Ptak tape.
  
- 2.11.8 Using the smoke tube and aspirator bulb, place the tube into the water sleeve (two (2) inch opening to glove bag). By squeezing the bulb, fill the bag with visible smoke. Remove the smoke tube and twist the water sleeve closed. While holding the water sleeve tightly, gently squeeze the glove bag and look for smoke leaking out, especially at the top and ends of the glove bag. If leaks are found, they shall be taped closed using tape and the bag shall be retested.

- 2.11.9 Insert the wand from the water sprayer through the water sleeve. Tape the water sleeve tightly around the wand to prevent leakage.
- 2.11.10 One (1) person places their hands into the long-sleeved gloves while the second person directs the water spray at the work.
- 2.11.11 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 snaps to remove the aluminum. It is important to fold the sharp edges into prevent cutting the bag when it is placed in the bottom. A box may be put in the bottom of the bag when the tools are placed in, and the metal placed in the box to further protect the bag from being cut.
- 2.11.12 With the insulation exposed, using the bone saw, cut the insulation at each end of the section to be removed. A bone saw is a serrated heavy-gauge wire with ring-type handles at each end. Throughout this process, water is sprayed on the cutting area to keep dust to a minimum.
- 2.11.13 Once the ends are cut, the section of insulation should be slit from end to end using the utility knife. The cut should be made along the bottom of the pipe and water continuously supplied. Again, care should be taken when using the knife not to puncture the bag. Some insulation may have wire to be clipped as well.
- 2.11.14 Rinse all tools with water inside the bag and place back into pouch.
- 2.11.15 The insulation can now be lifted off the pipe and gently placed in the bottom of the bag, while the side of the insulation adjacent to the pipe is being thoroughly wetted.
- 2.11.16 Using the scrub brush, rags and water, scrub and wipe down the exposed pipe.
- 2.11.17 Wet the donut-shaped pieces of wettable cloth over the exposed ends of insulation remaining on the pipe.
- 2.11.18 Remove the water wand from the water sleeve and attach the small nozzle from the HEPA-filtered vacuum. Turn on the vacuum only briefly to collapse the bag.
- 2.11.19 Remove the vacuum nozzle and twist the water sleeve closed and seal with tape.

- 2.11.20 From outside the bag, pull the tool pouch away from the bag. Place tape over the twisted portion and then cut the tool bag from the glove bag, cutting through the twisted/taped section. In this manner, the contaminated tools may be placed directly into the next glove bag without cleaning. Alternatively, the tool pouch with the tools can be placed in a bucket of water, opened underwater and the tools cleaned and dried without releasing asbestos into the air. Rags and the scrub brush cannot be cleaned in this manner and should be discarded with the asbestos waste. If more than one adjacent section of pipe is to be moved, the glove bag may be loosened at each end and slide along the pipe to the next section. In this case, the tools would remain in the bag for continued use.
- 2.11.21 With removed insulation in the bottom of the bag, twist the bag several times and tape it to keep the material in the bottom during removal of the glove bag from the pipe.
- 2.11.22 Slip a six (6) mil. disposal bag over the glove bag (still attached to the pipe). Remove the tape and open the top of the glove bag and fold it down into the disposal bag.
- 2.11.23 All surfaces in the work area shall be cleaned using disposable cloths wetted with amended water. These cloths shall be disposed of or rinsed thoroughly to eliminate visible accumulation of debris. Then, when these surfaces have been allowed to dry, all surfaces shall be cleaned again using a HEPA filtered vacuum.
- 2.11.24 Place any contaminated articles, debris, etc., into the bag with the waste.
- 2.11.25 Twist the top of the bag closed, fold this over and seal with Ptak tape. Place this bag into a second six (6) mil. disposable bag and seal as in the above manner. Label the bag with a warning label.

## **2.12 FLOOR TILE NON-FRIABLE REMOVAL PROCEDURES**

- 2.12.1 This section is intended to specify the required tasks of removing floor tile utilizing non-friable methods. The Contractor shall prepare an Alternative Method Request for the API to review and sign prior to submitting to the City of Philadelphia's Air Management Services (AMS) for final approval. Approval of the alternative method would permit the Contractor to remove these materials utilizing non-friable abatement methods.



- 2.12.2 Floor tile is a non-friable, Category I materials. This material must remain intact during the abatement process. The determination of how much breakage during removal that would make this process a friable task shall be made by the on-site API. Should the on-site API deem the work as friable, work shall be halted and shall proceed according to containment methods defined by the ACR.
- 2.12.3 Pre-clean work area. This shall include thorough wet cleaning and/or HEPA vacuuming of all surfaces to the satisfaction of the API prior to installation of isolation barriers or covering equipment, etc. within the work area.
- 2.12.4 Isolate abatement area from adjacent areas by covering openings and penetrations to non-work areas with critical barriers, as appropriate. These shall include but not be limited to: drains, doorways, windows, stairwells, pipe chases, systems, electrical shaft ways, conduit openings, hatches, etc.
- 2.12.5 Cover existing non-removable items and equipment with critical barriers. This shall include all HVAC system equipment, duct work, registers, lights, junction boxes, and other items/equipment above the existing ceiling.
- 2.12.6 Where required, installation of Separation Barriers shall be at the discretion of the API.
- 2.12.7 Repair of Damaged Polyethylene Sheeting: Remove and replace plastic sheeting which has been damaged by removal operations or where seal has failed allowing water to seep between layers. Remove affected sheeting and wipe down entire area. Install new sheet plastic only when area is completely dry.
- 2.12.8 Upon receipt of written approval of satisfactory work area preparation and pre-commencement inspection, proceed with removal of ACBM within the work area.
- 2.12.9 Remove all designated VAT from the work area as asbestos waste using approved non-friable removal techniques.
- 2.12.10 During the removal process, all VAT waste shall be placed in impermeable, leak tight containers. The waste should not be permitted to accumulate in the work area.
- 2.12.11 Conduct final cleaning of the work area to the satisfaction of the API.

2.12.12 Apply an approved asbestos abatement sealant, sufficiently distinct in color to allow for the identification of the coating of sealant agent shall be compatible with and shall not affect the adherence or performance of any replacement materials.

### **2.13 ASBESTOS CONTAINING PAINT STABILIZATION**

2.13.1 This section applies to the stabilization of damaged asbestos containing paint located on the CMU walls and concrete ceilings in the original building (Element I).

2.13.2 Asbestos containing paint is classified as a friable material. Each work area shall follow the Project Standards as defined by the Philadelphia Asbestos Control Regulations (ACR) and applicable sections of this specification. Table I shall be referenced for project classification of each work area.

### **2.14 ASBESTOS CONTAINING PAINT- CORING AND DRILLING**

2.14.1 This section is intended to specify the required tasks of coring and drilling asbestos containing paint on the CMU walls and concrete ceilings in the original building (Element I).

2.14.2 Asbestos containing paint is classified as a friable material. Each coring/drilling location shall follow Project Standards as defined by the Asbestos Control Regulations based on square footage being impacted. This section assumes each location to be five (5) square feet or less and therefore performed as an incidental project.

2.14.3 The Contractor shall specify the type and size penetration required. Each location shall be marked and reviewed with the Abatement Contractor and Asbestos Project Inspector (AIR).

2.14.4 The Asbestos Inspection Report (AIR) shall be updated to reflect the location and quantity of material being impacted.

2.14.5 The work area shall be sectioned off-limits with caution tape and asbestos signage. One layer of six (6) mil Polyethylene sheeting shall be placed on the floor in the work area extending at least five (5) feet in all directions.

- 2.14.6 Cover existing non-movable items and equipment with critical barriers. This shall include all HVAC system equipment, duct work, and registers.
- 2.14.7 Where required, installation of Separation Barriers shall be at the discretion of the API.
- 2.14.8 A HEPA equipped dust collection attachment must be utilized. During the process, the area being impacted shall also be sprayed with amended water.
- 2.14.9 Upon an acceptable final visual inspection performed by the on-site API, the polyethylene floor covering shall be placed in asbestos disposal bags and labeled appropriately for disposal as asbestos waste.
- 2.14.10 The work area shall be HEPA vacuumed and wet-wiped to ensure no residue dust remains.

## **2.15 REMOVAL OF GLUE DOTS ASSOCIATED WITH BLACKBOARDS/TACKBOARDS**

- 2.15.1 The glue dots associated with the classroom blackboards/tackboards are assumed to contain asbestos.
- 2.15.2 Glue dots are a non-friable, Category I material and must be removed as a non-friable project. The glue dots must remain intact during the abatement process. The use of mechanical equipment that will render this material friable is not permitted.
- 2.15.3 The determination of how much breakage during removal that would make this process a friable task shall be made by the on-site API. Should the on-site API deem the work as friable, work shall be halted and shall proceed according to containment methods defined by the ACR.
- 2.15.4 Install flooring coverings with one layer of polyethylene sheeting extending at least five feet from the work area.
- 2.15.5 The glue dot waste and polyethylene floor covering should be placed in asbestos disposal bags. The associated blackboards and tack boards should be wrapped in two layers of polyethylene sheeting and disposed of as asbestos waste. All waste should be labeled appropriately for disposal as asbestos waste.



2.15.6 Conduct final cleaning of the work area to a dust-free standard approved by the API.

## **2.16 ASBESTOS PROJECT INSPECTOR (API SERVICES & LABORATORY TESTING)**

2.16.1 The work is not to be included in the Contract Sum. Although this section describes work to be conducted by entities other than the asbestos abatement contractor, certain requirements and criteria stated herein, apply to the contractor's work.

2.16.2 Owner shall employ the services of a Testing Laboratory that is AIHA accredited, and/or a current, proficient participant in the AIHA/NIOSH PAT Program and NBS Asbestos Bulk Sample Quality Assurance Program.

2.16.3 The API shall provide continuous monitoring and inspection to include work area inspections and air samples outside of the work area to ensure they remain free from contamination. Acceptable levels outside the work area will be: 0.01 fibers/cc - Analysis via Phase Contrast Microscopy.

2.16.4 Inspections will include checking the standard operating procedures, engineering control systems, respiratory protection and decontamination systems, packaging and disposal of asbestos waste, and any other aspects of the project that may affect the health and safety of the people and environment.

2.16.5 The API shall have access to all areas of the asbestos removal project at all times and shall continuously inspect and monitor the performance of the Contractor to verify that said performance complies with this specification. The API shall be on site throughout the entire abatement operation.

2.16.6 The API shall have the authority to direct the actions of the Contractor verbally and in writing to assure compliance. The API shall have authority to require that all workers present a license issued by the Pennsylvania Department of Labor and Industry before entering the work site. The API shall have the authority to test the seal of the respirator of all who enter the work site to ensure a proper fit. In matters of gross negligence and/or flagrant disregard for the safety of others including the possibility of contaminating the building environment and the appearance of an emergent, unsafe condition at the work site, the API shall have the authority to stop work. In the event of continual noncompliance or serious violation, the API shall notify the inspector from the administrative authority



having jurisdiction that shall issue a written Stop Work Order to the Contractor and have the work site secured until all violations are abated.

- 2.16.7 The API, upon receipt of testing results indicating concentrations above 0.01 fibers/cc have occurred outside the containment barriers during the abatement, shall report these results within one working day verbally or by telephone communication if necessary to the Contractor and the Owner so prompt corrective action may be taken.
- 2.16.8 The API shall keep a daily log of on-site observations concerning Contractor's compliance with activities required under this subchapter. This log shall be made available upon request at all times to the Owner and appropriate local and State agencies.
- 2.16.9 Removal phase shall be conducted as follows:
- a. Monitoring outside the work area shall be provided throughout removal operations to ensure no outside contamination is occurring.
  - b. Filter cassettes and sampling train shall be assembled as specified in NIOSH #7400A. The flow rate shall be between 0.5 and 16 liters per minute. The total volume shall be a volume sufficient to achieve a detection limit of 0.01 f/cc but not less than 2,000 liters of air. Pumps shall be calibrated before and after sampling and a record kept of this calibration.
  - c. A minimum of three (3) samples per day (2 samples per 10,000 sf) shall be provided at each work area. One (1) stationary sample at the decontamination unit entrance/exit and two (2) samples adjacent to work area but remote from the decontamination unit entrance shall be collected. Preference shall be given to spaces adjacent to critical barriers.
  - d. If the Contractor's barriers or other control methods are observed to malfunction and if the Contractor does not correct the problems immediately upon notification, the API shall inform the administrative authority having jurisdiction. In such a situation, the API shall perform additional sampling.
  - e. The analysis of air samples shall be done using NIOSH Method 7400.
  - f. The evaluation criteria shall be 0.01 fibers per cubic centimeter via PCM.

- g. A series of smoke tests shall be performed at the decontamination unit entrance/exit, by the API to ensure continuous negative air pressure. This test shall be performed before each work shift and every four hours thereafter until the work stops.
- h. The API shall calculate the required number of negative air filtration units for each work area. This calculation shall be made whenever the volume of the work area changes. The API shall inform the Owner and Contractor of any discrepancies between the number of units required and those in operation within the work area. If problems are identified and not corrected, the API shall inform the administrative authority having jurisdiction.
- i. A record shall be kept in a daily log of all on-site observations and required activities of the Contractor.

2.16.10 Post-removal testing for asbestos shall be conducted as follows:

- a. Within 48 hours after final clean-up and before the removal of critical barriers, final air testing shall be performed. This testing is required to establish safe conditions for removal of critical barriers and to permit reconstruction activity to begin. Sufficient time following clean-up activities shall be allowed so that all surfaces are dry during monitoring. Negative air filtration units shall be in use during monitoring.
- b. The API, in addition to fans, shall use one (1) horsepower leaf blowers to re-entrain into the atmosphere any fibers which had previously settled out. Their use will be restricted to general occupancy areas, and they will not be used in any space with an open dirt, sand or gravel floor.
- c. Filter cassettes and sampling trains shall be assembled as specified in 40 CFR Part 763, Appendix A to Subpart E. The flow rate shall be between 1.0 and 15.0 liters per minute. Collect a minimum volume of air sufficient to achieve a detection limit of 0.01 fibers/cc, but not less than 1,200 liters of air.
- d. In all work areas, the post removal clearance testing shall meet the following criteria:
- e. If the above criteria have not been met, the contractor shall be required to re-clean all surfaces using wet cleaning methods and provide negative

pressure procedures during the recleaning process. This process of recleaning, allowing surfaces to dry and re-testing shall be repeated until compliance is achieved.

- f. The Owner shall be responsible for cost incurred with the required laboratory work for initial clearance monitoring as performed by API. Any subsequent air monitoring and the costs associated with same, that is required due to limits exceeded during initial clearance testing or as a result of the contractor's failure to meet the contractual completion date shall be assumed by the Contractor.

Post removal sampling for all full containment major work areas will be performed using Transmission Electron Microscopy (TEM). The clearance level for TEM samples will be less than or equal to 70 structures per cubic centimeter. The results must also meet the requirements of geometric mean as defined by Philadelphia Asbestos Control Regulations.

Post removal sampling for all limited containment minor work areas and non-friable work areas will be performed using Phase Contrast Microscopy (PCM). The clearance level for PCM samples will be less than or equal to 0.01 fibers per cubic centimeter as defined by Philadelphia Asbestos Control Regulations and the Asbestos Hazard Emergency Response Act (AHERA).

- g. Subsequent sampling and the costs associated with same, that is required due to limits exceeded during initial clearance testing or as a result of the contractor's failure to meet the contractual completion date shall be assumed by the Contractor.

## **END OF SECTION**