ADDENDUM NO. 1

DATE: March 11, 2016
INVITATION FOR BID (IFB): M160017155 – Whitcomb Court Elementary School Abatement and Demolition Project
DATED: March 2, 2016
RECEIPT DATE: March 31, 2016
OPENING DATE: April 1, 2016
SUBJECT: Asbestos/PCB/Mercury Abatement Specifications

Ladies/Gentlemen:

Please take note of the following:

Asbestos/PCB/Mercury Abatement Specification has been added. Please see the document on the following page.

Vendor must take due notice and be governed accordingly. This addendum must be acknowledged and included with the bid submission as indicated in the IFB or your response may not be considered.

Sincerely,

Michael Jackson
Contract Specialist

RESPECTFULLY SUBMITTED:

________________________________________________________________________
Company
BY:________________________________________________________________________
________________________________________________________________________
Title Date
January 20, 2016

**Timmons Group**
1001 Boulders Parkway  
Suite 300  
Richmond, Virginia 23225

ATTN: Mr. Jason Mullins

RE: Asbestos/PCB/Mercury Abatement Specifications  
Former Whitcomb Court Elementary School  
2100 Sussex Street  
Richmond, Virginia  
FEI Project Number: FEI-15AL448

Dear Mr. Mullins:

France Environmental, Inc. (FEI) has completed the Asbestos/PCB/Mercury Abatement Specification sections for the Environmental Abatement Project at the above referenced Elementary School building. Please find enclosed with this letter the Asbestos/PCB/Mercury Abatement Specification Sections; Asbestos Abatement Project Monitoring Specification Section; and Asbestos/PCB/Mercury Abatement Drawings. Should you have any questions regarding these specifications, please contact me at (804) 716-0560.

Respectfully Submitted,

**FRANCE ENVIRONMENTAL, INC.**

Andrew H. Baird  
Project Designer  

Joseph T. France  
Project Manager

Enclosures: Asbestos/PCB/Mercury Abatement Specification Plans
ASBESTOS/PCB/MERCURY ABATEMENT SPECIFICATION PLANS

FORMER WHITCOMB COURT ELEMNTARY SCHOOL COMPLETE BUILDING DEMOLITION PROJECT
2100 SUSSEX STREET
RICHMOND, VIRGINIA

PREPARED FOR:

TIMMONS GROUP
1001 BOULDERS PARKWAY
SUITE 300
RICHMOND, VIRGINIA 23225

PREPARED BY:

FRANCE ENVIRONMENTAL, INC.
7834 FOREST HILL AVE, SUITE 7
RICHMOND, VIRGINIA 23225
(804) 716.0560 (PHONE)
(804) 918.7098 (FAX)

ANDREW H. BAIRD
VA ASBESTOS DESIGNER
LICENSE #3305001104

FEI PROJECT NO. FEI-15AL448

JANUARY 20, 2016
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SECTION 13280 - ASBESTOS ABATEMENT

PART 1 - GENERAL

1.1 SUMMARY OF WORK

A. RELATED DOCUMENTS: Drawings and general provisions of the Contract apply to this work.

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

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

D. PROJECT SUMMARY: The intent of this asbestos abatement project is to remove all asbestos-containing materials (ACM’s) prior to the building demolition. The contractor is responsible for the selective demolition of boiler equipment to determine if any suspect materials are present. It is the contractor’s responsibility to coordinate their schedule with the Owner’s Project Monitoring Firm.

E. MATERIALS TO BE REMOVED: The following building materials shall be removed by the asbestos abatement contractor:

1. Building Materials presumed or determined to be asbestos-containing by laboratory analysis to be abated under the scope of this project include the following:
   a. Asbestos-containing vinyl floor tile, mastic. Includes mastics that were determined to have a trace amount of asbestos.
   b. Asbestos-containing interior and exterior transite ceiling panels.
   c. Asbestos-containing thermal systems insulation (TSI) including, but not limited to, mudded-joint-packing’s (MJP’s) elbow insulation.
   d. Asbestos-containing chalk board mastic.
   e. Asbestos-containing exterior window glaze.
   f. Asbestos-containing exterior stone wall caulk; exterior door caulk; exterior window caulk; and exterior louver caulk.
   g. Asbestos-containing sink bowl coating.
   h. Asbestos-containing heat shields associated with circular light fixtures.
   i. Asbestos-containing exterior silver paint on roof flashing and mechanical equipment.
   j. Asbestos-containing exterior black roof mastic.
k. Presumed asbestos-containing mudded-joint-packing’s (MJP’s) pipe elbow associated with fiberglass insulation (above ceiling).
l. Presumed asbestos-containing interior boiler refractory mud; fire bricks; and gaskets associated with boiler units.

Refer to the Asbestos Abatement Drawings for approximate locations of materials to be removed.

F. SEQUENCE OF WORK: The contractor shall follow the general sequence of events as described below.

1. Preparation of the work area.
2. Containment of the work area.
4. Encapsulation of the work area.
5. Removal of the containment materials.

1.2 DESCRIPTION

A. Furnish all labor, materials, services, insurance, and equipment in accordance with the most stringent requirements of EPA and OSHA and all other applicable regulatory agencies, to complete the removal of asbestos-containing materials as described in the Summary of Work.

1.3 SUBMITTAL REQUIREMENTS

A. Pre-work Submittal

1. NOTICES: Submit Notices to the appropriate agency as required by State and Federal Regulations.
2. PERMITS: Submit copies of current valid permits required by state and local regulations, including arrangements for storage, transportation, and disposal of contaminated material. Dumpsite must conform EPA regulation 40 CFR 61.
3. LICENSES: Submit copies of all state and local licenses and permits necessary to carry out the work including but not limited to contractor license, supervisor licenses, and worker licenses.
4. ABATEMENT PLAN: Submit an abatement plan describing the means and methods of removing the materials identified along with schedule and phasing plan.
5. CONTAINMENT AREAS: Show on Contract Drawings or an 8-1/2” x 11” plan of the containment areas (numbered sequentially), including the locations and quantity of negative air pressure equipment, the location of all decontamination chambers, entrances, and emergency exits from the work areas.
6. WORKER TRAINING: The Contractor shall submit a list of the persons who will be employed by him and his subcontractors in the removal work. Present evidence that workers have received proper training required by regulations and the medical examinations required by OSHA 29 CFR 1926.1101. Distinguish between trained, full-time personnel and "pick-up" labor.
7. SAFETY DATA SHEET: Submit a Safety Data Sheet, or equivalent for each material proposed for use on the work in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200). Include a separate attachment for each sheet indicating
the specific worker protective equipment proposed for use with the material indicated
and/or manufacturer's specification.

B. CLOSE-OUT SUBMITTALS

1. Submit copies of the fully completed Waste Shipment Records (WSR) as
documentation of compliance with NESHAP 61.150 (d) (3) and (4).
2. Submit OSHA compliance air monitoring records conducted during the work.
3. Submit copies of the daily progress logs.
4. Submit copies of Visitors' Logs.

1.4 TERMINOLOGY (Definitions)

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

B. FOR THIS PROJECT:

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

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

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

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

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

G. AUTHORIZED VISITOR: The Building Owner, the Building Owner's representative, the
Architect/Engineer's personnel, or a representative of any regulatory or other agency having
jurisdiction over the project.
H. **BARRIER**: Any surface that inhibits air and fiber movement from the work area to non-work areas. Can be comprised of one or a combination of several materials, including but not limited to plywood, polyethylene sheeting, duct tape, and spray-poly. A critical barrier is one that seals any opening (such as doorways, vents, windows, penetrations) between the work area and non-work area.

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

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

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

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

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

N. **PERSONNEL DECONTAMINATION UNIT**: A decontamination enclosure system for workers, typically consisting of a designated area of the work area (gross contaminant removal station), an equipment room, an air lock, a shower, an air lock, and a clean room.

- **Equipment Room**: A contaminated area or room in the personnel decontamination enclosure system with provisions for storage of contaminated clothing and equipment.
- **AIR LOCK**
- **Shower Room**: A room between the two (2) air locks in the personnel decontamination enclosure system with hot and cold running water suitably arranged for complete showering during decontamination.
- **AIR LOCK**
- **Clean Room**: An uncontaminated area or room that is part of the worker decontamination unit with provisions for storage of workers' street clothes and protective equipment.

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

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

Q. **HEPA VACUUM EQUIPMENT**: High efficiency particulate air filtered vacuuming equipment with a filter system capable of collecting and retaining asbestos fibers. Filters should be of 99.97% efficiency for retaining fibers greater than 0.3 microns in length.
R. NEGATIVE AIR PRESSURE EQUIPMENT: A local exhaust system, capable of maintaining constant, low velocity airflow through the Decontamination Unit and into the Work Area from adjacent uncontaminated areas and exhausting that air outside the building through HEPA filters.

S. NIOSH: National Institute for Occupational Safety and Health.

T. ON-SITE REPRESENTATIVE: Owner's full-time representative responsible for air monitoring and site observation. Also referred to as Project Monitor.

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

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

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

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

1.5 CODES AND REGULATIONS

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

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

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

2. US Environmental Protection Agency (EPA) including but not limited to:
   b. Regulation for Asbestos - Title 40, Part 61, Subpart A of the Code of Federal Regulations
   d. Asbestos Hazard Emergency Response Act (AHERA) - 40 CFR Part 763

3. US Department of Transportation (DOT) including but not limited to:
   a. Hazardous Substances: Final Rule - Regulation 49 CFR, Parts 171 and 172

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

1. Virginia Department of Labor and Industry
   a. Licensed Asbestos Contractor Notification, Asbestos Project Permits, and Permit Fees Regulations VR 425-01-74

2. Virginia Department of Environmental Quality
   a. Solid Waste Regulations VR 672-20-10

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

1. American National Standards Institute (ANSI)
   a. Fundamentals Governing the Design and Operation of Local Exhaust Systems, Publication Z9.2-79
   b. Practices for Respiratory Protection, Publication Z88.2-80

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

1.6 ASBESTOS ABATEMENT PHASING

A. Asbestos abatement work shall be scheduled and coordinated with the City of Richmond, General Contractor (if applicable), and Project Monitor. The Abatement Contractor is responsible for coordinating with the Project Monitor a minimum of 48 hours in advance of site mobilization. No abatement work shall commence on this project unless the Owner’s Project Monitor is present.
PART 2 - EQUIPMENT AND MATERIALS

2.1 PERSONNEL PROTECTION REQUIREMENTS

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

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

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

D. Where not in violation of NIOSH and OSHA requirements, the contractor shall provide, as a minimum, the following respirator protection for each phase of operation:

1. Precleaning/Wet Wiping of Area: NIOSH approved half-face dual cartridge respirators equipped with HEPA cartridges.
2. Plastic Installation: NIOSH approved half-face dual cartridge respirators equipped with HEPA cartridges.
3. Asbestos Removal: NIOSH approved half-face dual cartridge respirators equipped with HEPA cartridges for non-friable materials and full face NIOSH approved powered air purifying respirator (PAPR) for friable materials. If mastic solvents are to be utilized on site, appropriate respiratory protection is required in accordance with the manufactures recommendation.
4. Plastic Removal: NIOSH approved half-face dual cartridge respirators equipped with HEPA cartridges.
5. Loading Waste Material on Truck (outside work area): NIOSH approved half-face dual cartridge respirators equipped with HEPA cartridges.
6. Unloading Bags at Landfill: NIOSH approved half-face dual cartridge respirators equipped with HEPA cartridges.

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

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

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

2.2 MATERIALS

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

1. Store all materials subject to damage off the ground, away from wet or damp surfaces, and under cover sufficient to prevent damage or contamination.

2. Damaged or deteriorating materials shall not be used and shall be removed from the premises. Material that becomes contaminated with asbestos shall be disposed of in accordance with applicable regulations.

B. PLASTIC SHEETING: A minimum of two 6-mil layers for floors where floor tile/resilient sheet flooring is not being removed and three 4-mil or two 6-mil layers for the walls, in sizes to minimize the frequency of joints. Flame retardant polyethylene sheeting shall be used where applicable to comply with fire code requirements.

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

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

1. For this project, #M76, 77, Poly Prep spray adhesive or equal.

E. CAULKS: Not Applicable.

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

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

H. WARNING LABELS AND SIGNS: As required by OSHA regulations 29 CFR 1926.1101.
I. **GLOVE BAGS:** Safe-T-Strip as manufactured by Asbeguard Equipment, Inc., 130 Esna Park Drive, Markham, Ontario, Canada, L3R 1E3, Profo-Bag as manufactured by Asbestos Control Technology, Inc., P. O. Box 183, 38 North Pine Avenue, Maple Shade, New Jersey, 08052, or approved equal.

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

K. **MASTIC REMOVER:** Commercial mastic removers may be used on this project.

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

2.3 **TOOLS AND EQUIPMENT**

A. Provide suitable tools for asbestos removal. This site does not have water or electricity supplied to the building. The contractor is responsible for providing ample power and water to successfully complete this project. The contractor must ensure negative pressure is maintained within containments from the time asbestos abatement has started until the containment is cleared by the Project Monitor.

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

3.1 POSTING OF THE PROJECT

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

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

**DANGER**

**ASBESTOS**

**CANCER AND LUNG DISEASE HAZARD**

**AUTHORIZED PERSONNEL ONLY**

**RESPIRATORS AND PROTECTIVE CLOTHING**

ARE REQUIRED IN THIS AREA

C. Remove signs upon completion of abatement.

3.2 WORK AREA PREPARATION

A. Contractor shall establish temporary power to the site with the use of portable power (i.e. Generators) or temporary power from Dominion Virginia Power. The existing wiring inside the building is not safe to use.

B. Contractor shall provide water to the site with the use of portable water tanks or coordinate with City Officials to establish a temporary water hook-up to the municipal water system. The existing plumbing system within the building has been compromised and should not be used.

C. Before the work is begun, and unless otherwise specified, the Owner shall remove from work areas, all removable items and equipment not located on the asbestos materials.

3.3 WORK AREAS - WORK BY CONTRACTOR

A. Preclean fixed objects within the work area, first using HEPA vacuum equipment and then wet cleaning methods as appropriate, and completely enclose with minimum 6-mil thick plastic sheeting sealed with tape.

B. Clean work areas where debris or visible dust is present and in areas where floor materials are not being removed. Clean the work area first using HEPA vacuum equipment and then wet cleaning methods as appropriate. Do not use methods that raise dust, such as dry sweeping or vacuuming with equipment not equipped with HEPA filters. Do not use HEPA vacuum
equipment on wet surfaces unless units are specially constructed for wet/dry use. HEPA vacuum or damp sponge with regular water would be appropriate.

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

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

1. **Caulks; Glaze; Sink Mastic/Chalk Board Mastic; Circular Light/Heat Shields:** Establish a work area from the floor level, which will protect individuals from the dangers of falling objects. A drop cloth shall be used on the interior/exterior of the building to catch any debris. The asbestos-containing materials shall be removed intact if possible then residual materials hand scraped and disposed of as asbestos-containing waste. Barricade tape shall be used to demarcate the regulated areas. A sufficient number of competent personnel shall be used to restrict unauthorized personnel from entering the regulated areas while asbestos abatement is being performed.

2. **Vinyl Floor Tile & Mastic:** The negative pressure containment shall consist, at a minimum, of critical barriers over windows, doors, and openings (i.e. HVAC diffusers, returns, exhaust fans, etc.). A two-stage decontamination unit with a wash station may be used in place of a three-stage decontamination unit providing the vinyl floor tile and mastic is removed in a manner that it is not deemed friable. (If a floor chipper, buffer or bead blaster is used for removal, a full negative pressure containment with three stage decontamination unit is required). Vinyl floor tile; and mastic shall be removed in accordance with Section 13280 - Paragraph 3.15. If the vinyl floor tile and mastic is removed in a manner where it would be deemed friable (as determined by the Project Monitor), then a Decontamination Enclosure System is required in accordance with Section 13280 - Paragraph 3.4.

3. **Roofing Materials:** Segregate and remove asbestos-containing roofing materials prior to demolition of other exterior building materials. Removal of asbestos-containing roofing materials shall be performed by licensed asbestos abatement workers/supervisors. Remove as intact as possible, and dispose of asbestos-containing roofing materials. Establish a regulated work area from the ground level, which will protect individuals from the dangers of falling objects. The regulated work area shall consist of a 25’ radius (minimum) horizontally around the work area. Barricade tape shall be used to demarcate the regulated areas. A drop cloth shall be used on the exterior of the building to catch any debris. A sufficient number of competent personnel shall be used to restrict unauthorized personnel from entering the regulated areas while asbestos abatement is being performed. All roof waste will either be bagged and lowered (not thrown) to the ground or placed in a container that has been double lined with six-mil polyethylene sheeting in a size large enough to cover the debris at the end of the work shift.

4. **Exterior/Interior Transite Ceiling Panels:** Establish a work area, which consists of a 25’ radius (minimum) horizontally around the work area. Barricade tape shall be used to demarcate the regulated areas. Poly drop cloths shall be placed throughout the regulated area. Material shall be thoroughly wet with amended water and removed as intact as possible. Waste can be placed in asbestos marked poly bags and or poly lined drums with asbestos warning labels on it.
5. **Thermal Systems Insulation (TSI):** These materials shall be abated using a negative pressure containment with a Decontamination Enclosure System as described in Section 13280 - Paragraph 3.4. The negative pressure containment shall consist of critical barriers over windows, doors, and openings (i.e. HVAC diffusers, returns, exhaust fans, etc.). Two (2) layers of 6-mil polyethylene sheeting shall be installed on the walls, floors, and ceilings where appropriate. Negative pressure Glove Bags may be used for the removal of MJP’s in place of a full containment where appropriate. Glove Bags shall be used in accordance with Section 13281 - Paragraph 3.16.

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

### 3.4 DECONTAMINATION ENCLOSURE SYSTEMS

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

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

C. **WORKER DECONTAMINATION ENCLOSURE SYSTEM:** Construct a worker decontamination enclosure system contiguous to the work area consisting of three (3) totally enclosed chambers as follows:

1. An equipment room with two (2) curtained doorways, one to the work area and one to the shower room, via an air lock.
2. A shower room with two (2) curtained doorways, one to the equipment room and one to the clean room, via air locks. The shower room shall contain at least one shower with hot and cold or warm water with individual shut-off valves inside the showers. Careful attention shall be paid to the shower enclosure to insure against leakage of any kind. Ensure a supply of soap at all times in the shower room. Drainage from showers shall be disposed of as contaminated water or filtered as specified below.
3. Waste water containing asbestos, including drainage from decontamination showers, shall be either disposed of as contaminated waste or filtered in accordance with the following requirements prior to introduction into the sanitary sewer system.
   a. Filter water using four in-line filter cartridges with 2" inlets and outlets. The outlet of each filter cartridge shall be connected in series to the inlet of the next cartridge. The first cartridge shall contain 100-micron prefilters and the second and third cartridge shall contain 25-micron filters and the final cartridge shall contain 5-micron filters.
   b. Spare filters of all three sizes shall be maintained at the site at all times to replace prefilters during cleaning.
   c. When the prefilters become clogged, replace with spares, dispose of accumulated debris as contaminated waste, and wash out the prefilters in the shower, allowing the drainage from the cleaning operation to go through the filtration system.
d. When the final filters become clogged, remove the filters, replace with new, and dispose of the clogged filters as contaminated waste.
e. Provide a holding tank for contaminated wastewater as required to prevent backup of water into the shower when the amount of water generated exceeds the flow rate of the filters.

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

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

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

3.5 MAINTENANCE OF DECONTAMINATION ENCLOSURES

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

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

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

D. Fresh towels shall be available at all times.

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

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

G. Provide storage for wet and dry towels.

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

I. At the end of each decontamination period, the shower, air locks, and clean room shall be cleaned and dried.

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

3.6 SEPARATION OF WORK AREAS FROM NONWORK AREAS (NOT USED)
3.7 WORKER PROTECTION - TO BE POSTED IN CLEAN AND EQUIPMENT ROOMS

A. All workers and authorized personnel, in order to enter the work area, shall:
   1. Remove clothing, unless it is to remain in the equipment room for eventual disposal.
   2. Don protective clothing (coveralls, gloves, boots, etc.).
   3. Don the appropriate respiratory protection, following all training procedures and manufacturer's instructions. Hood shall be worn over respirator straps.

B. All workers and authorized personnel, in order to leave the work area, shall:
   1. Remove gross (visible) contamination from themselves and their equipment.
   2. Enter the equipment room and, keeping respirator in place, remove all protective clothing, including gloves and boots. Place contaminated clothing in the bag(s) provided. Store gloves and/or boots in their respective areas.
   3. Still wearing the respirator, proceed to the first air lock. Once inside, ensure all curtained doorways behind are properly closed.
   4. Respirator still in place, move into the shower room and rinse off thoroughly. If wearing dual cartridge respirators, make sure the cartridges are completely soaked before removing the respirator and disposing of cartridges in the container provided. Pass respirators into the second air lock (between shower and the clean room).
   5. Complete showering, thoroughly soaping, and shampooing.
   6. Proceed to the clean room, dry off, dress, and return respirator to the storage area.
   7. No smoking, eating, or drinking shall be allowed inside decontamination enclosures.

3.8 COMMUNICATIONS

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

B. If readily achievable, a viewing window shall be installed to facilitate observation of the work area.

3.9 FIRE EXITS

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

3.10 SECURITY

A. The contractor is responsible for maintaining building / property security throughout the abatement / demolition project. If generators are used to provide power they must remain on at all times during while an active abatement area is on-going. The contractor is responsible for the security of their equipment (i.e. generators) and keeping them fueled during work and non-work hours.
3.11 LOCATION AND ACTIVATION OF NEGATIVE AIR PRESSURE

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


C. Provide one spare exhaust unit per three (3) units at all times. Spare exhaust units shall be of the same size and capacity as the largest operating units.

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

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

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

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

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

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

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

K. After removal has begun, maintain operation of exhaust units continuously to maintain a constant negative pressure until decontamination of the work area is complete. Do not turn units off at the end of the work shift or when removal operations temporarily stop.
L. Change filters in exhaust units in accordance with manufacturer's recommendations and Paragraph J.3.2.2.1 of the EPA document, Guidance for Controlling Friable Asbestos-Containing Materials in Buildings, "Purple Book", June 1985 or when there is obvious loss of negative pressure.

M. When a final inspection and the results of the final air monitoring tests indicate an acceptable level of airborne fibers, remove and dispose of prefilters and shut off the exhaust units. If the exhaust units are to be used in another work area, leave the final filter in place and seal all intake openings to the unit to prevent contamination due to asbestos fibers collected on the final filter. If the exhaust units are not to be used in other work areas, remove the final filter and dispose of as contaminated waste.

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

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

3.12 EQUIPMENT REMOVAL PROCEDURES

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

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

3.13 VISUAL INSPECTIONS

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

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

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

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

3.14 GROSS REMOVAL OPERATIONS

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

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

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

E. Ensure all disposal containers are properly labeled in conformance with 29 CFR 1926.1101 and 40 CFR 61. Refer to Section 13281 - Paragraph 1.5 (Codes and Regulations) of this section.

F. The Contractor shall mobilize truck and/or dumpster to entrance of staging area to load out asbestos-containing materials (double bagged and properly labeled with generator labels).

3.15 ASBESTOS VINYL FLOOR TILE/MASTIC REMOVAL

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

B. Prepare the area in accordance with Section 13281 - Paragraph 3.3.

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

D. Vinyl floor tile and mastic, which is being removed in areas undergoing friable abatement, may be removed in manners that may deem the vinyl floor tile and mastic friable. Vinyl floor tile and mastic being removed in areas not undergoing friable removal shall be removed in accordance with the following:

1. Wet floor with amended water, removal encapsulant, or detergent solution, so that entire surface is wet. Do not allow to puddle or run off to other areas. If a removal encapsulant is used, use in strict accordance with Manufacturer’s Instructions. Cover with sheet polyethylene to allow humidity to release tile from floor. Allow time for humidity and water or removal encapsulant to loosen tiles prior to removal.
2. Remove loose tiles and wrap manageable stacks of tiles in two layers of 6-mil polyethylene. Continue wetting during removal and take care not to break the tiles.
3. Tiles, which do not come loose after saturation, will be removed using methods that minimize the breakup of individual tiles. Continue wetting during removal.
4. Sanding of the tiles or adhesive is not permitted.

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

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

G. All refuse shall be disposed of as asbestos-containing waste in accordance with Section 13281 - Paragraph 3.18 (Disposal Of Asbestos-Containing Waste).

H. Ensure all disposal container are properly labeled in conformance with 29 CFR 1926.58 and 40 CFR 61. Refer to Section 13281 - Paragraph 1.5 (Codes and Regulations) of this section.

3.16 GLOVE BAGS

A. This method is optional only in areas not scheduled for gross removal operations and must comply with OSHA requirements for a negative pressure work area environment. At all times the contractor will utilize two (2) workers during glove bagging operations, one of which will act as support personnel.

B. Glove bags may only be used in accordance with these specifications or approval from the Asbestos Project Designer.

C. Abatement Contractor shall be required to arrange equipment to protect it with sealed polyethylene sheeting tape and/or adhesive. The Contractor shall rope off an area at least twenty-five feet (25’) on all sides of glove bag work location to restrict personnel movement during the removal process and post the proper caution signs.

D. Clean and protect all floors, and walls, as necessary, within the work area with 4-mil polyethylene sheeting, tape and/or adhesives. As a minimum, extend polyethylene one foot (1’) horizontally in all directions for each vertical foot from floor to material height.

E. If fiber levels found on the personal samples during glove bag removal exceed 0.01 f/cc and methods to reduce the excess prove futile, the Contractor shall remove the insulation under "gross removal" conditions with full plastic sheeting, decontamination unit, negative air filtration, etc. at the discretion of the Project Monitor.
F. Using approved glove bags in strict accordance with the Manufacturer's Instructions, workers in full protective body clothing and dual cartridge respirators may begin removal of pipe insulation as per the following, or Manufacturer's Instructions. In case of conflict, the more stringent provisions shall apply:

1. Cut the sides of the glove bag to fit the size of pipe you will be working on and insert the tools you will need into the attached tool pocket.
2. Attach the glove bag to the working area by folding the open edges together and sealing with staples and tape. Any additional support which may be necessary to support the weight of the debris shall be provided.
3. Seal the edges of the glove bag around the working area with tape or adjustable straps to form a tight seal. Slice open the side port to allow entry of the wetting tube and HEPA vacuum hose. Insert the nozzle from the portable sprayer, seal around it with tape, and thoroughly wet the area to be removed.
4. Conduct a smoke test on each installed glove bag to ensure the bag is completely sealed. Seal any breaches within the bag.
5. Insert arms into the armholes and gloves and proceed to remove the asbestos from the elbow, valve fitting or pipe. At locations where the insulation rests directly on pipe hangers or supports, the Contractor shall resupport the pipe by shimming with wood blocks or other suitable materials. Continue wetting the material as required. Thoroughly wet the remaining pipe and insulation and wash down the inside of the glove bag. Scrub or brush any remaining suspect insulation material from the pipe or fitting.
6. The tools shall be pulled through one of the glove inserts, thus turning the gloves inside-out. Twist, tape around the twist, and cut through the tape to remove the glove with the tools. This glove may then be placed into the next glovebag. When glove bag operations are complete, clean tools by cleaning any residual materials from tools and disposing of glovebag and water as contaminated waste.

When the job has been completed, remove the spray nozzle, insert the HEPA vacuum nozzle, and turn on the HEPA vacuum to remove air from the bag. With the air removed from the glove bag, squeeze the bag tightly as close to the top as possible and twist seal and tape to keep the asbestos material safely at the bottom of the bag. Turn off the HEPA vacuum, remove the hose from the side port, and seal the side port with tape.

7. Cut and remove the glove bag from the working area and place it into a second 6-mil polyethylene bag. Move bags to holding area or disposal storage unit.
8. Mist surface of protective polyethylene and carefully fold inward. Proceed to HEPA vacuum the work area for any residual materials and seal the exposed edges and piping with the proper encapsulant sealants such as American Coating 2B or approved equal.

G. Testing shall be in accordance with Section 13280 – Section 1.1 (Testing/Air Monitoring).

H. If final testing results indicate readings less than 0.01 f/cc, all seals, plastic, debris and decontamination enclosures shall be removed and disposed of as contaminated waste.

I. If testing results indicate fiber levels of 0.01 f/cc or greater, the work area shall remain sealed and demarcated until less than 0.01 f/cc is attained.

J. All cleaning shall be accomplished using wet methods and/or HEPA vacuuming equipment.
K. Reestablish objects moved by the contractor to temporary locations in the course of the work, in their proper positions.

3.17 DISPOSAL OF ASBESTOS-CONTAINING MATERIAL AND ASBESTOS CONTAMINATED WASTE

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

1. LABEL REQUIREMENTS: Provide labels affixed to all asbestos waste containers:

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

   DANGER

   CONTAINS ASBESTOS FIBERS

   AVOID CREATING DUST

   CANCER AND LUNG DISEASE HAZARD

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

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

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

   
   **RQ HAZARDOUS**
   
   **SUBSTANCE**
   
   **SOLID, NOS**
   
   **ORM-E, NA 9188**
   
   *(ASBESTOS)*

   b. As required by NESHAP, 40 CFR 61, Subpart M, mark vehicle used to transport asbestos-containing waste material during the loading and unloading of the waste so that the signs are visible as follows:

   **DANGER**
   
   **ASBESTOS DUST HAZARDS**
   
   **CANCER AND LUNG DISEASE HAZARD**
   
   **AUTHORIZED PERSONNEL ONLY**

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

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

3.18 **GROSS CLEANUP**

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

   B. The entire work area shall be totally, visibly clean. The Contractor shall notify the Owner’s Project Monitor of the time the work area will be subject for visual inspection. This inspection shall be certified by the Contractor and will be verified by the representative using the "Certification of Visual Inspection" found in the Testing Section.
3.19 POST-REMOVAL ENCAPSULATION OF AFFECTED AREAS

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

B. ENCAPSULANTS

1. Upon completion of encapsulation of surfaces from which asbestos has been removed, the Contractor shall inform the on-site representative that the area is ready for compliance monitoring.

3.20 RE-ESTABLISHMENT OF OBJECTS AND SYSTEMS

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

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

PART 1 - GENERAL

1.1 TESTING/AIR MONITORING

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

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

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

D. The Abatement Contractor shall be responsible for providing personal monitoring of his employees as per OSHA 1926.1101.

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

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

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

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

   1. The services of a testing laboratory will be employed by the Owner’s Project Monitor to perform laboratory analysis of the air samples. A microscope and technician will be set up at the job site, or samples will be sent daily to a laboratory, so that written reports on air samples can be obtained within 24 hours of conducting sampling.
H. **Final Compliance Monitoring:** Final Compliance Monitoring shall be conducted in accordance with the Environmental Protection Agency’s (EPA) and these specifications. Analysis of samples taken after final cleanup shall be by Phase Contrast Microscopy (PCM). Exterior removal of non-friable materials removed intact will not require an air clearance to be conducted. However, a final visual inspection by the Owner’s Project Monitor will be required. The Owner’s Project Monitor will conduct final air clearance monitoring. Sampling shall start after the following:

1. HEPA vacuuming and wet cleaning of all surfaces of the work area must have been conducted.
2. All visible accumulations of asbestos-containing waste material must have been removed from the work area, as determined by the Owner’s Certified Industrial Hygienist/Project Monitor.
3. First polyethylene layer must have been removed from walls and floors.
4. Completion of a satisfactory visual inspection by the Project Monitor.
5. The area completely covered by a spray encapsulant.
6. All surfaces within the regulated area shall be completely dry, spray applied encapsulant shall be completely dry.
7. If asbestos-containing materials being removed within the homogeneous area are less than 160 square feet, 260 linear feet, or 35 cubic feet, then samples may be analyzed by PCM and conducted in accordance with the following:

   a. A minimum of three (3) area samples shall be taken after the first 12-hour settling period. Such samples shall conform to the following:

<table>
<thead>
<tr>
<th>Sample Minimum Volume (Liters)</th>
<th>Flow Rate (Liters/Minute)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3,850*</td>
<td>5 - 10</td>
</tr>
</tbody>
</table>

   *Sample Volume is dependent upon work conditions and judgment of the Owner’s Project Monitor.

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

1.2 **CERTIFICATION OF VISUAL INSPECTION**

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

Building: ____________________________________________________________

Project Number: ____________________________________________________________

Specific Area: ____________________________________________________________

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

By: (Signature) ___________________________ Date: ___________________________

(Print Name) ___________________________ Title: ___________________________

Company Name: ____________________________________________________________

ABATEMENT INSPECTOR'S CERTIFICATION

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

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

Clearance air sample numbers are: ____________________________________________

By: (Signature) ___________________________ Date: ___________________________

(Print Name) ___________________________ Title: ___________________________

Final Air Clearance Passed the Clearance Criteria of (<0.01 f/cc) by PCM Analysis:

Final Air Clearance Passed the Clear. Criteria of (<70 structures/mm²) by TEM Analysis:

Final Air Clearance Failed the Clearance Criteria of (>0.01 f/cc) by PCM Analysis:

Final Air Clearance Failed the Clear. Criteria of (>70 structures/mm²) by TEM Analysis:

END OF SECTION 13281
SECTION 13282 – LIGHT TUBES; SWITCHES & BALLASTS

PART 1 - GENERAL

1.1 SUMMARY OF WORK

A. RELATED DOCUMENTS: Drawings and general provisions of the Contract apply to this work.

B. SCOPE OF WORK: Removal and disposal of PCB-containing lighting ballasts; mercury-containing fluorescent and high intensity discharge (HID) lamps; and thermostat switches.

1.2 DESCRIPTION OF WORK

A. The Contractor shall supply all labor, materials, equipment, services, insurance, and incidentals which are necessary or required to perform the work in accordance with applicable city, state and federal regulations and these specifications.

B. Contractor shall remove and dispose of the fluorescent light ballasts; fluorescent light tubes; switches; and HID lamps in accordance with this specification. An approximate count of the number of fluorescent lamps (171.5 lamps) and all HID light fixtures affected by work. Many of the ballasts are electronic, but some older units may have PCB/DEHP (approximately 284 older style ballasts) and one (1) mercury-containing thermostat switch, which need to be removed during the demolition work. The newer ballasts will be disposed of as electronic waste.

C. Coordinate the timing of fluorescent light ballast, tube and switch removal with the Owner’s Representative.

1.3 DEFINITIONS

A. Leak or Leaking: Any instance in which a PCB-Containing Light Fixture Ballasts; and Mercury-Containing Fluorescent Light Fixture Tubes/ Switch or Equipment that has any PCBs/Mercury on any portion of its external surface.

B. Manifest: The shipping document EPA form 8700-22 and any continuation sheet attached to EPA form 8700-22, originated and signed by the generator of PCB-Containing Light Fixture Ballasts; and Mercury-Containing Fluorescent Light Fixture Tubes/ Switch waste.

C. Mercury-Containing Lamps/Switch: As used in this specification shall mean all fluorescent and high-intensity discharge (HID) lamps/ Switch scheduled for demolition and/or removal.

D. Polychlorinated Biphenyls (PCBs): Any chemical substance that is limited to the biphenyl molecule that has been chlorinated to varying degrees or any combination of substances which contains such substance.
1.4 STANDARDS

A. The current issue of each document shall govern. Where conflict among requirements or with these specifications exists, the more stringent requirements shall apply.

Code of Federal Regulations (CFR)

1. 29 CFR 1910.1000 - Air Contaminants
2. 40 CFR 761 - Polychlorinated Biphenyls (PCBs)- Manufacturing, Processing, Distribution Commerce, and Use Prohibitions
3. 40 CFR 262 - Generators of Hazardous Waste
4. 40 CFR 263 - Transporters of Hazardous Waste
5. 40 CFR 273.5 - Universal Waste Lamps
8. CFR 178 - Shipping Container Specification

1.5 QUALITY ASSURANCE

A. Perform PCB related work in accordance with 40 CFR 761.

B. Training- Train all persons involved in the removal of PCB containing lighting ballasts and mercury-containing lamps/switches. The instruction shall include: the dangers of PCB and mercury exposure, decontamination, safe work practices, and applicable OSHA and EPA regulations.

C. Documents - Maintain at all times one copy at the office and one copy onsite of the Contractor removal work plan and disposal plan for PCB and associated mercury-containing lamps/switches.

1.6 SUBMITTALS

A. Training: Submit proof (i.e. training certificates) for the proper training of workers and supervisors on this project.

B. Work Plan- Submit a PCB and Mercury-Containing Lamp/Switch / Ballast Removal Work Plan which includes, but is not limited to: work procedures to be used in the removal, packaging, and storage of PCB-containing lighting ballasts and associated mercury-containing lamps/switches. Include in the plan: Requirements for Personal Protective Equipment (PPE), spill cleanup procedures and equipment, eating, smoking and restroom procedures. Obtain approval of the plan by the Owner prior to the start of the PCB and/or lamp removal work.

C. Disposal Plan – Submit a PCB and Mercury-Containing Lamp/Switch / Ballast Disposal Plan including names, locations and certificates of transportation company and disposal site.

D. Closeout Submittals – Submit a Certification of Disposal and/or recycling. Submit to the Owner before application for payment but within 30 days of the date that the disposal of the PCB and Mercury-containing waste identified on the manifest was completed.
1.7 ENVIRONMENTAL REQUIREMENTS

A. Use disposable gloves (Nitrile), eye protection, and PPE as required when handling light ballasts and light tubes.
PART 2- EXECUTION

2.1 WORK PROCEDURE

A. Furnish labor, materials, services, and equipment necessary for the removal of PCB containing light ballasts and mercury-containing fluorescent lamps and switches in accordance with local, state, and federal regulations. Do not expose PCB's to open flames or other high temperature sources since toxic decomposition by-products may be produced. Do not break mercury-containing fluorescent lamps or switches.

2.2 WORK OPERATIONS

A. Ensure that work operations or processes involving PCB or PCB-contaminated materials are conducted in accordance with 40 CFR 761, 40 CFR 262, 40 CFR 263, and the applicable requirements of this section, including but not limited to:

1. Obtaining suitable PCB and mercury-containing lamp/switch storage sites.
2. Notifying Owner prior to commencing the operation
3. Reporting leaks and spills to the Owner.
4. Cleaning up spills.
5. Inspecting PCB and PCB-contaminated items and waste containers for leaks and forwarding copies of inspection reports to the Owner.
6. Maintaining inspection, inventory, and spill records.

2.3 PCB SPILL CLEANUP REQUIREMENTS

A. PCB Spills - Immediately report PCB spills to the Owner.

B. PCB Spill Control Area - Rope off an area around the edges of a PCB leak or spill and post a "PCB Spill Authorized Personnel Only" caution sign. Immediately transfer leaking items to a drip pan or other container.

C. PCB Spill Cleanup - 40 CFR 761, subpart G. Initiate cleanup of spills as soon as possible, but no later than within 24 hours of its discovery. Mop up the liquid with rags or other conventional absorbent. The spent absorbent shall be properly contained and disposed of as solid PCB waste.

D. Records and Certification- Document the cleanup with records of decontamination in accordance with 40 CFR 761, Section 125, Requirements for PCB Spill Cleanup. Provide test results of cleanup and certification of decontamination.
2.4 REMOVAL

A. Ballasts - As ballasts are removed from the lighting fixture, inspect label on ballast. Ballasts without a "No PCB" label shall be assumed to contain PCBs and containerized and disposed of as required under paragraphs STORAGE FOR DISPOSAL and DISPOSAL. Establish whether the "No PCB" labeled ballasts contain di (2-ethylhexyl) phthalate (DEHP) either by test or by checking with the ballast manufacturer indicated on the label. If the ballasts do not contain PCBs or DEHP, then handle, store, and dispose/recycle the ballasts as electrical waste. If the ballasts do contain DEHP, dispose of them as hazardous material in accordance with Federal, State, and local regulations. As a basis of bid, assume ballasts with "NO PCB" labels will be disposed of as electrical waste.

B. Lighting Lamps/Switches - Remove lighting tubes/lamps from the lighting fixture and switches from thermostats and carefully pack (unbroken) into appropriate containers. In the event of a lighting tube/lamp/switch breaking, sweep and place waste in double plastic taped bags and dispose of as hazardous waste as specified herein.

2.5 STORAGE FOR DISPOSAL

A. Storage Containers for PCBs - 49 CFR 178. Store PCB in containers approved by DOT for PCB.

B. Storage Containers for lamps - Store mercury-containing lamps in appropriate DOT containers. The boxes shall be stored and labeled for transport in accordance with 40 CFR 272, 40 CFR 263, 9VAC 20-60 and 9 VAC 20-80.

C. Labeling of Waste Containers - Label with the following:

1. Date the item was placed in storage and the name of the activity/building.
3. Label mercury-containing lamp/switch waste in accordance with 40 CFR 273. Affix labels to all lighting waste containers.

2.6 DISPOSAL

A. Dispose of ballasts and light tubes/switches off City property in accordance with EPA, DOT, and local regulations at a permitted site.

B. Identification Number - Obtain a small quantity hazardous waste generator ID number from the Virginia Department of Environmental Quality (DEQ) for the site.

C. Transporter Certification - Comply with disposal and transportation requirements outlined in 40 CFR 761 and 40 CFR 263. Before transporting the PCB waste, sign and date the manifest acknowledging acceptance of the PCB waste from the City. Return a signed copy to the Owner before leaving the job site. Ensure that the manifest accompanies the PCB waste at all times. Submit transporter certification of notification to EPA of their PCB waste activities (EPA Form 7710-53).
D. Certificate of Disposal-40 CFR 761. Certificate for the ballasts and tubes/switches disposed of shall include:

1. The identity of the disposal facility, by name, address, and EPA identification number.
2. The identity of the waste affected by the Certificate of Disposal including reference to the manifest number for the shipment.
3. A statement certifying the fact of disposal of the identified waste, including the date(s) of disposal, and identifying the disposal process used.

END OF SECTION 13282
APPENDIX A. – ASBESTOS ABATEMENT DRAWING
APPENDIX B. - PCB’S & MERCURY-CONTAINING EQUIPMENT ABATEMENT DRAWING