

ADDENDUM 2 - April 12, 2017

Swampscott Public Schools

Request for Quotes

2017-02

Middle School Asbestos Abatement and Tile
Replacement

The following replaces pages 20 through 62 of the original bid.

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*Attorney/Client Work Product
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**SPECIFICATION
FOR
ASBESTOS ABATEMENT**

*Swampscott Middle School
207 Forest Avenue
Swampscott, Massachusetts
Swampscott Public Schools*

March 27, 2017

Prepared for:

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Swampscott, MA 01907*

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SECTION 02 82 13
ASBESTOS ABATEMENT

PART 1 - GENERAL

1.01 **GENERAL PROVISIONS**

- A. Attention is directed to the Swampscott Public School's General Terms and Conditions as applicable, and is hereby made part of the Specifications.
- B. By submitting a bid, the Contractor acknowledges that they have investigated and satisfied themselves as to (a) the conditions affecting the work, including but not limited to physical site conditions that may bear upon access, handling and storage of tools and materials, access to water, electric or other utilities, or otherwise affect performance of required activities; and (b) the character and quantity of all surface and subsurface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from a site inspection, including exploratory work done by the Town of Swampscott Public Schools (the "Owner") or ESIS (the "Consultant"), as well as information presented in this specification. Any failure by the Contractor to acquaint themselves with available information will not relieve them from the responsibility for properly estimating the difficulty or cost of successfully performing the work outlined in this specification. The Owner and ESIS are not responsible for any conclusions or interpretations made by the Contractor on the basis of the information made available by the Owner and/or ESIS.
- C. No bids will be accepted from any party who has not inspected the job site either in person or through a qualified designated representative, unless waived by an authorized representative of Swampscott Public Schools and/or ESIS. ~~A Site visit has been tentatively scheduled at 2:30 PM on March 27, 2017.~~

1.02 **DESCRIPTION OF WORK**

- A. This Section specifies the requirements for the Asbestos-Containing Materials (ACMs) abatement at the Swampscott Middle School, located at 207 Forest Avenue in Swampscott, Massachusetts (the "Site"). The Site will be available to inspect during the pre-bid conference and at other times provided by the site representative/property owner, so that bidders can properly understand the abatement scope of work including selective demolition and other activities necessary to access and remove all ACM's. ~~The Asbestos Survey's "Schedule of Quantities and Locations" included as an attachment (Attachment A) to this document indicates the approximate locations of visible and estimated ACMs. This document should be reviewed prior to submitting a bid to better understand the selective demolition and other activities necessary to access and remove all ACM at the Site. In general, the Contractor will isolate each work area to perform abatement.~~
- C. The intent of the Work is to completely remove all ACMs from the 2nd floor classrooms at the Site. The Contractor shall be responsible to determine the most efficient method to legally perform the Work. This specification does not dictate specific methods to be implemented in the work performance. The entire ACM application shall be removed inclusive of any substrate

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contamination, whether present on the substrate surface or embedded in the component substrate matrix. After abatement is complete, the building or equipment component must be rendered completely free of asbestos and rendered recyclable, reusable, and/or disposable in accordance with all applicable regulations.

- D. All of the Work shall be performed in accordance with these Specifications, United States Environmental Protection Agency (EPA), United States Occupational Safety and Health Administration (OSHA), United States Department of Transportation (DOT), National Institute of Occupational Safety and Health (NIOSH), Commonwealth of Massachusetts Department of Environmental Protection (MassDEP), Commonwealth of Massachusetts Department of Labor Standards (MADLS) and other state and local regulations. Wherever there is a conflict or overlap of the above references, the most stringent provisions apply (see Paragraph 1.07 of this Section).
- E. ~~The quantities listed in Attachment A represent estimates only and are not guaranteed. The Contractor shall not use quantities listed herein as the sole basis for preparing their bids.~~ Materials identified herein should be reviewed completely and thoroughly by bidders during the pre-bid site visit and other viewing times made available by the Owner. The bidders are responsible for reviewing and confirming all quantities and field conditions, including: locations, surface area, thickness, cross-sectional area, component layers, and substrate conditions. Neither the Owner, nor the Consultant will be responsible for errors or omissions and/or charges for extra work arising from any bidder's failure to become familiar with the existing site conditions. The Owner will not consider claims for extra payment due to incorrect quantities. By submitting a bid, the bidder agrees and warrants that they are familiar with the existing site conditions, work requirements and the results to be produced. By submitting a bid, the bidder further agrees that the descriptions contained herein (i.e., quantities, descriptions, locations, areas, thicknesses, etc.) are adequate and that the bidder will produce the required results.
- F. The Contractor must have a current Massachusetts Department of Labor Asbestos ~~Abatement~~Removal Contractor's License, and meet other qualification requirements specified herein and in the regulations.
- G. The Contractor shall provide all equipment, labor, materials, and services to perform the Work as follows:
 - 1. Isolate, seal and prepare each Work Area, install temporary staging, scaffolding, platforms, containment/critical barriers, polyethylene sheeting, negative air units, manifolds for air intakes/exhausts and decontamination facilities, temporary power, lighting, and mechanical lifts, and perform all other activities including those directed by Consultant as required to access and remove ACM ~~and listed Hazardous Materials~~.
 - 2. Perform all selective demolition of plaster/drywall walls and relocation of stored items and modular partitions and other building materials as necessary to access and remove all ACM to the satisfaction of the Consultant.
 - 3. Remove all contaminated debris, contaminated items and all ACM ~~as identified in Attachment A or otherwise identified during the Work~~.

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4. Thoroughly clean each Work Area. The Consultant will perform clearance air sampling in accordance with the EPA Asbestos Hazard Emergency Response Act (AHERA) or MADLS re-occupancy requirements. If the Consultant and/or Owner deem it necessary, substrate cleanliness will be confirmed via collection of bulk or wipe samples for analysis via Polarized Light Microscopy (PLM) and/or Transmission Electron Microscopy (TEM). If the Consultant deems additional cleaning is necessary, the Contractor shall comply at no additional cost to the Owner.
5. Properly dispose of all contaminated and non-contaminated (waste generated during pre-abatement demolition or cleaning procedures) waste material. All asbestos waste must be disposed at a permitted asbestos waste landfill.
6. Protect all existing security systems, live areas, cables and other operating items throughout the Work.
7. Compliance with all Owner's abatement, construction, and demolition requirements and procedures.
8. Furnishing of all labor, materials, equipment, and services required for the Work of this Section.
9. Compliance with all applicable (defined to include all amended, revised or newly promulgated regulations that may become applicable to the work) federal, state and local regulations as well as all requirements set forth in this Specification.
10. Performance of any other work or activities required by this Specification, applicable regulations, or as necessary to perform a "complete job" to the satisfaction of the Consultant, the Owner and the Commonwealth of Massachusetts.

1.03 DEFINITIONS

A. The following definitions pertain to this Section only and are not applicable to other Work of the Contract:

1. Abatement - Procedures to control fiber release from asbestos-containing materials; includes removal, encapsulation, and enclosure.
2. Air Monitoring - The process of measuring the fiber concentration of an area or the breathing zone of a person.
3. Amended Water -Water to which a surfactant has been added.
4. Asbestos -The name given to a number of naturally occurring fibrous silicates. This includes the serpentine forms and the amphiboles and includes chrysotile, amosite, crocidolite, tremolite, anthophyllite, and actinolite, or any of these forms which have been chemically altered.
5. Asbestos Work Area -A regulated area as defined by OSHA 29 CFR 1926.1101 where asbestos abatement operations are performed which is isolated by physical boundaries to prevent the spread of asbestos dust, fibers, or debris. The regulated area shall comply with requirements of

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regulated area for demarcation, access, respirators, prohibited activities, competent persons and exposure assessments and monitoring.

6. Asbestos Fibers - Particles with a length greater than five (5) microns and a length to diameter ratio of 3:1 or greater.
7. Cease and Desist Order- An order issued by the Department of Labor and Workforce Development Commissioner closing a work site where the Commissioner determines that violations of a workplace standard relative to the protection of the occupational health and safety of workers or of any standard or requirement of licensure exist.
8. Clean Room - An uncontaminated area or room which is a part of the worker decontamination enclosure with provisions for storage of workers' street clothes and protective equipment.
9. Commissioner -The Commissioner of the Department of Labor and Workforce Development or his/her designee.
10. Competent Person - As defined by 29 CFR 1926.1101, a representative of the Abatement Contractor who is capable of identifying existing asbestos hazards in the workplace and selecting the appropriate control strategy for asbestos exposure and has authority to take prompt corrective measures to eliminate such hazards during asbestos removal. Competent person shall be properly trained in accordance with EPA's Model Accreditation Plan.
11. Consultant - A company retained by the Owner with a Massachusetts-certified asbestos designer and project monitors to provide services enumerated in this section during asbestos abatement.
12. Asbestos Abatement Subcontractor - Any person, firm, corporation, or other entity who has a valid license issued by the Commonwealth of Massachusetts for the purpose of entering into or engaging in asbestos abatement work.
13. Class I Asbestos Work - means activities involving the removal of thermal system insulation (TSI) and surfacing asbestos containing materials (ACM) and presumed ACM (PACM).
14. Class II Asbestos Work- means activities involving the removal of ACM which is not thermal system insulation or surfacing material. This includes, but is not limited to, the removal of asbestos containing wallboard, floor tile and sheeting roofing and siding shingles, and construction mastics.
15. Curtained Doorway - A device to allow ingress and egress from one area to another while permitting minimal air movement between the areas. Two curtained doorways spaced a minimum of six feet apart from an airlock.
16. Decontamination Enclosure System - A series of connected areas, with curtained doorways between any two adjacent areas, for the decontamination of workers and equipment. A decontamination enclosure system contains at least one airlock and is adjacent and connected to the regulated area, where feasible.

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17. Encapsulant - A liquid material which can be applied to asbestos-containing materials which controls the possible release of asbestos fibers from the materials either by creating a membrane over the surface (bridging encapsulant) or penetrating the material and binding its components together (penetrating encapsulant).
18. Equipment Room -A contaminated area or a room which is part of the worker decontamination enclosure with provisions for storage of contaminated clothing and equipment.
19. Fixed Object- A unit of equipment or furniture in the work areas which cannot be removed from the work area.
20. Friable Asbestos Material -Any material that contains more than 1% asbestos as determined by Polarized Light Microscopy (PLM), that can be crumbled, pulverized or reduced to powder by hand pressure.
21. HEPA Filter- A high efficiency particulate air (HEPA) filter in compliance with ANSI Z9.2-1979.
22. HEPA Vacuum Equipment- Vacuum equipment with a HEPA filter system for filtering the effluent air from the unit.
23. License - A document issued by the DLS authorizing an asbestos abatement to engage in the business of asbestos abatement projects.
24. MADLS - The Massachusetts Department of Labor Standards formerly known as the Division of Occupational Safety (DOS).
25. Movable Object - A unit of equipment or furniture in the work area which can be removed from the work area.
26. NESHAPS - National Emissions Standard for Hazardous Air Pollutants, regulations enforced by the EPA.
27. Permissible Exposure Level (PEL) -The maximum airborne concentration of asbestos fibers to which an employee is allowed to be exposed. The new level established by OSHA 29 CFR 1926.1101 is 0.1 fibers per cubic centimeter of air as an eight (8) hour time weighted average and 1.0 fibers/cc averaged over a sampling period of 20 minutes as an excursion limit. The Asbestos Abatement Subcontractor is responsible for maintaining work areas in a manner that this standard is not exceeded.
28. Project Monitor - A professional capable of conducting air monitoring and analysis schemes. This individual should be an industrial hygienist, an environmental scientist or an engineer with experience in asbestos air monitoring and worker protection equipment and procedures. This individual should have demonstrated proficiency in collection of air samples in accordance with 29 CFR 1910.1001 and 1926.1101. The project monitor shall be licensed in the Commonwealth of Massachusetts and possess appropriate training certificates including current refresher training for project monitor.

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29. Regulated Area - An area established by the employer (Asbestos Abatement Subcontractor) to demarcate where Class I, II, and III asbestos work is conducted and any adjoining area where debris and waste from such asbestos work accumulate, and a work area within which airborne concentrations of asbestos exceed or there is a reasonable possibility that they may exceed the PEL.
30. Shower Room -A room between the clean room and the equipment room in the worker decontamination enclosure with hot and cold running water and suitably arranged for employee showering during decontamination.
31. Surfactant - A chemical wetting agent added to water to improve penetration into asbestos-containing materials.
32. Visible Debris - Any visually detectable particulate residue such as dust, dirt, or other matter which may or may not contain asbestos.
33. Waterproofing - material, usually a membrane or applied compound (tar/mastic), used to make a surface impervious to water, includes concealed conditions (applications around doors, windows, and in wall cavities.) Sometimes combined with felts.

1.04 COORDINATION

- A. The Contractor shall coordinate all work with the Owner, the Consultant and other subcontractors who may be on site.

1.05 REQUIRED SUBMITTALS

- A. The Contractor shall submit to the Consultant the following listed documents. No asbestos abatement work activities shall commence until these items are reviewed and accepted by the Consultant. Submittal data shall be in sufficient detail to enable the Consultant to identify the particular product or equipment, and to form an opinion as to its conformity to these Specifications. Each submittal item shall be identified with a cover page or transmittal sheet containing the listed submittal number presented in the same numerical order as outlined below. Submittals shall be delivered to the Consultant no less than 10 business days prior to the scheduled start date as listed on the Asbestos Notification Form.
 1. The Contractor shall submit a notarized statement, signed by an officer of the company, providing the following information:
 - a. A list of any citations issued by Federal, State or Local regulatory agencies within the last three years relating to asbestos abatement activity, including project description, date and resolution (if any).
 - b. A list of all asbestos-related legal proceedings and/or claims initiated within the last three years in which the bidder or their employees have participated or are currently involved; this shall include descriptions of roles, the relevant issues and resolution date.
 2. Name and experience of proposed Supervisors.

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3. Summary of workforce by disciplines, and a notarized statement documenting that all proposed workers have received all required medicals and have been properly trained in asbestos removal work, listed hazardous materials removal work, respirator use, and appropriate MADLS, MassDEP, EPA and OSHA standards.
4. Notarized Certification: Submit certification signed by a company officer of the asbestos abatement contracting firm and notarized that personal exposure monitoring, medical surveillance, and worker training records are being kept in conformance with OSHA Title 29 CFR, Part 1926.
5. Plan of Action & Standard Operating Procedures: Submit a detailed plan of the procedures and engineering controls proposed for use in complying with the requirements of this Specification. Include in the plan, drawings or sketches detailing critical isolation barriers and enclosures, the location and layout of decontamination facilities; HEPA exhaust unit locations; lighting and power outlet locations; and of water supply location. In addition the plan shall include: demolition sequencing, asbestos abatement work; description or plan detailing individual work area locations, detailed schedule by dates, shift times, and work activities during that shift; the interface of trades involved in the Work; methods to be used to assure the safety of trades people and visitors to the Site and a detailed description of the methods to be employed to control air pollution. All work methods employed to execute the Work must be completely described in sufficient detail for the Consultant to form an opinion whether work methods comply with applicable regulations.
6. Written description, for the Consultant's review and acceptance, of all proposed procedures, methods, or equipment to be utilized that differ from the Contract Specifications, including manufacturers specifications on any equipment not specified for use by this Section; in all instances, the Asbestos Abatement Subcontractor must comply with all applicable federal, state and local regulations.
7. Chain-of-Command for responsibility at the work site including supervisors, foreman, and competent person, their names, resumes and certificates of training.
8. Contingency Plan: Submit a contingency plan for emergencies such as fire, accident, power failure, negative air system failure, or any other event that may require modifications or abridgment of decontamination or Work Area isolation procedures. Include in plan specific procedures for decontamination or Work Area isolation. Note that nothing outlined in this Specification should impede safe exiting or providing of adequate medical attention in the event of an emergency. Include telephone number and locations of emergency services including but not limited to fire, ambulance, doctor, hospital, police, power company, telephone/internet service provider.
9. A plan describing the exposure monitoring method to document compliance with OSHA, including frequency of monitoring, equipment and calibration methods, and name, state license and accreditations/certifications of asbestos analytical laboratory.
10. Completed copies of all required notifications, permits, and licenses. Also include Certificate of Insurance.

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11. Name, location, and applicable licenses for primary and secondary asbestos waste landfill. Name and applicable federal and state permits for asbestos waste transporter. Also, include Certificates of Insurance.
 12. Name, address, and ID number of the proposed construction debris site.
 13. Respiratory Protection Program: Submit level of respiratory protection intended for each operation required by the Work. Submit company written respiratory protection program.
 14. Training and Medical Surveillance Records: For supervisors, the Contractor shall submit to the Consultant the following items prior to starting any abatement work at the Site. For individual workers, submit the following items prior to the individual worker being allowed to work on the project:
 - a. Submit a legible copy of the training accreditation and MADLS asbestos worker certification for each worker.
 - b. Report from Medical Examination: Submit a copy of Physician's Written Opinion as defined by OSHA Title 29 CFR, Part 1926.1101(m)(4) for medical examination conducted within last 12 months as part of compliance with OSHA medical surveillance requirements for each worker who is to enter the Work Area.
 - c. Record of successful respirator fit testing performed by a qualified individual within the previous year, for each employee to be used on this project with the employee's name and social security number (last 4) with each record.
 15. A list of all chemicals intended to be used on Site during the Work. Material Safety Data Sheets (MSDS) must be provided for each product. This list shall include but not be limited to, poly, tape, spray glue, mastic remover, hand soap and surfactant.
- B. Submit the following items to the Consultant for approval during the Work under this Contract. These items shall be submitted without delay:
1. Daily logs of workers who enter abatement work areas - Submit Weekly.
 2. Results of personal exposure air monitoring - Submit Weekly.
 3. Recordings from Work Area air pressure differential monitor - Submit Weekly.
 4. Executed Asbestos Waste Shipment Records. Completed Asbestos Waste Shipment Records must be submitted within 30 calendar days of waste shipment from work site.

1.06 CONTRACTOR SUPERVISORY PERSONNEL REQUIREMENTS

Provide a full-time working supervisor or foreman for each Work Area who is experienced in the supervision of asbestos abatement projects including work practices, protective measures for

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building and personnel, disposal procedures, etc. This person shall remain inside the Work Area at all times while Work is in progress.

1.07 APPLICABLE STANDARDS

- A. 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 force and effect. All work shall conform to the standards set by applicable federal, state, and local laws, regulations and ordinances in such form in which they exist at the time of the Work under the Contract.
- B. Federal Requirements: Which govern asbestos and listed hazardous materials abatement work or hauling and disposal of asbestos or listed hazardous materials waste materials include but not limited to the following:
 - 1. OSHA Title 29 CFR, Parts 1910 and 1926, as applicable.
 - 2. EPA Title 40, Part 61 (National Emission Standards for Hazardous Air Pollutants) and Title 40 CFR, Part 763, Subpart E, as applicable.
 - 3. DOT, Title 49 CFR, Parts 172 and 173
- C. State Requirements: Which govern asbestos abatement work or hauling and disposal of asbestos waste materials include the following:
 - 1. MADLS, 453 CMR 6.00 in its entirety.
 - 2. MassDEP, 310 CMR 7.00, 7.15 and 19.000 in their entirety.
- E. Respiratory Protection Standards: Except to the extent that more stringent requirements are written directly into the Contract Documents, the following regulations and standards have the same force and effect. Where there is a conflict in requirements set forth in these regulations and standards, meet the more stringent requirement.
 - 1. ANSI American National Standard Practices for Respiratory Protection, ANSI Z88.2-1980.
 - 2. NIOSH National Institute for Occupational Safety and Health.
- F. Reference Guidelines: Which govern asbestos abatement work or hauling and disposal of asbestos waste materials include the following:
 - 1. ANSI
25 West 43rd Street, 4th Floor
New York, New York 10036
(212) 642-4900
 - a. Fundamentals Governing the Design and Operation of Local Exhaust Systems, ANSI Publication Z9.2-2012

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b. Practices for Respiratory Protection, ANSI Publication Z288.2-2015

1.08 NOTIFICATIONS, PERMITS, AND LICENSES

- A. Assure that written notification as required by USEPA National Emission Standards for Hazardous Air Pollutants (NESHAPS) Asbestos Regulations (40 CFR 61, Subpart M) has been sent to and received by the regional Asbestos NESHAPS Contact at least 10 Days prior to beginning any Work on asbestos-containing materials.
- B. State and Local Agencies: Send written notification as required by state and local regulations 10 business days prior to beginning asbestos abatement work.
 - 1. MADLS/MassDEP: Written notification using MassDEP form ANF-001. Forward a copy of the completed notification form to the Consultant at the time of submission.
 - 2. Local Agency Notification - Provide local agency notifications as required, such as but not limited to police, fire and emergency response personnel.
- C. Certifications/Licenses: Maintain current certifications/licenses as required by applicable state or local jurisdictions for removing, transporting, disposing or other regulated activity relating to the Work.
- D. Posting and Filing of Regulations: Maintain two copies of applicable federal, state, and local regulations. Post one copy of each at the Site.

1.09 CONTRACTOR AND PERSONNEL QUALIFICATIONS

- A. Proposed asbestos abatement personnel must meet all specification requirements. Submission by the Contractor of the following is required under Paragraph 1.05 of this Section.
 - 1. Personnel Qualifications: All Contractor personnel involved with asbestos abatement must be appropriately trained and certified by the MADLS prior to performing any work at the Site; they shall also be thoroughly familiar with the Contractor's standard operating procedures for abatement. All personnel shall undergo OSHA medical examinations. The superintendents and the supervisors shall be thoroughly familiar with all applicable regulations and practices for asbestos abatement, and shall have participated in at least three abatement projects during the last two years. All personnel shall be trained in the use and care of respirators and shall pass an OSHA-specified respirator fit test. Anyone without the above qualifications shall not be allowed to perform work at the Site.
 - a. For Supervisor and Foreman: (see Paragraph 1.05 of this Section):
 - i. Training and knowledge of applicable regulations and expertise in safety and environmental protection as evidenced by the participation and successful completion of a supervisor's training course and annual refresher courses as described by 453 CMR 6.00 and offered by a MADLS-certified training provider.

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ii. Experience with asbestos abatement work as evidenced through participation in at least three similar asbestos abatement projects within the last 2 years.

b. For Workers:

i. Training as evidenced by the participation and successful completion of a 32 hour training course provided by MADLS-certified training provider.

1.10 AVAILABILITY OF TRAINED PERSONNEL

A. There shall be a sufficient number of trained and qualified workers, and supervisors to accomplish the Work within the required schedule. Since general construction/demolition work activities cannot start prior to the successful decontamination of Work Areas, it is imperative that a sufficient number of trained personnel be engaged throughout the Work. Only trained, certified, and qualified personnel shall be employed to expedite the completion of the Work.

1.11 RESPIRATORY PROTECTION

A. The Contractor shall provide all workers, supervisors, authorized visitors, and inspectors' personally-issued NIOSH-approved respirators. When respirators with disposable filters are employed, the Contractor shall provide sufficient filters for replacement as necessary by the worker or authorized visitors. Filters shall be disposed as asbestos-contaminated waste material.

B. The Contractor shall ensure that respiratory protection is provided to workers in accordance with applicable OSHA regulations. .

C. Initial Exposure Assessment

1. Unless the Contractor submits a valid NEA, the Contractor shall ensure that a "competent person" conduct an exposure assessment immediately before, or at the initiation of work to determine expected exposures during the work in accordance with OSHA Title 29 CFR, Part 1926.1101. For Class II asbestos work, until the Contractor conducts exposure monitoring and documents that workers conducting the Work will not be exposed above the OSHA Permissible Exposure Limit (PEL), or otherwise makes a negative exposure assessment (NEA), the Contractor shall assume that workers are exposed in excess of the PEL or excursion limit.

2. The Contractor may demonstrate that worker exposures will be below the PEL by data which conforms to the requirements of OSHA Title 29 CFR, Part 1926.1101:

D. Respiratory protection shall be worn at all times, including preparation of the Work Area, loading and unloading of waste containers in the Work Area or at the transporting vehicle, Work Area cleaning, and removal of Work Area isolation barriers.

1.12 TEMPORARY FACILITIES

A. The Contractor shall provide temporary utilities as required herein or as necessary to carry out the work. All costs associated with the installation and establishment of temporary utilities and facilities shall be the responsibility of the Contractor and shall be included within this bid. Use

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qualified tradesmen for installation of temporary services and facilities. Locate temporary services and facilities where they will serve the entire project adequately and result in minimum interference with the performance of the Work. Relocate, modify and extend services and facilities as required during the work so as to accommodate the entire work of the project.

- B. Water Service: Contractor shall make the necessary water service connections to existing building service and/or fire hydrants, and coordinate this activity with the Consultant. Sufficient hot water supply for all workers and visitors shall be supplied by the Contractor at a minimum temperature of 100 degrees F. Supply hot and cold water, adjustable at the faucet, to the decontamination facility in accordance to Paragraph 3.04 of this Section.
- C. Electrical Service: Comply with applicable National Electric Codes (NEC), and Underwriters Laboratories (UL) standards and governing regulations for materials and layout of temporary electric service. Provide all equipment, wiring, transformers, and power panels as needed to connect into the existing electric power service and distribution system, with sufficient size, capacity, and power characteristics to accommodate performance of work during the construction period. Install temporary lighting adequate to provide sufficient illumination for safe work and traffic conditions in every area of Work.
 - 1. Temporary Power: Provide service to Decontamination Unit of suitable size and capacity to accommodate all electrical equipment required for completion of the Work.
 - 2. Voltage Differences: Provide identification warning signs at power outlets which are other than 110-120 volt power. Provide polarized outlets for plug-in type outlets, to prevent insertion of 110-120 volt plugs into higher voltage outlets. Dry type transformers shall be provided where required to provide voltages necessary for work operations.
 - 3. Ground Fault Circuit Interruption Protection (GFCI): Provide receptacle outlets equipped with ground-fault circuit interrupters, reset button and pilot light, for all tools and equipment.
 - 4. Power Distribution System: Provide circuits of adequate size and proper characteristics for each use. All lighting circuits and power receptacles shall be GFI protected.
 - 5. Provide electrical outlets in the clean room, equipment room, and at locations inside and outside the Work Area as specified by the Consultant for the exclusive use of the Consultant for air monitoring purposes.
- D. Temporary Lighting: Provide general service incandescent lamps of wattage required for adequate illumination. Protect lamps with guard cages or tempered glass enclosures, where fixtures are exposed to breakage by construction operations. Provide exterior fixtures where fixtures are exposed to the weather or moisture.
- E. Temporary Heating: Provide temporary heat where needed for performance of the Work. Provide temporary heating units that have been tested and labeled by UL, Factory Mutual (FM) or another recognized trade association related to the fuel being consumed. Use steam or hot water radiant heat where available, and where not available use electric resistant fin radiation supplied from a branch circuit with ground fault circuit interrupter. Under no circumstances shall forced air or fan type units be utilized inside a Work Area. Work Area temperatures are to be maintained such that water is available at all times to perform the work.

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- F. Sanitary Facilities: Provide sufficient number of portable sanitation facilities to be located in an area approved by the Consultant. No toilet facilities are available at the work site.
 - 1. Maintain sanitary facilities in a sanitary condition at all times. Maintain security to prevent unauthorized personnel to use sanitary facilities.
 - 2. Remove sanitary facilities from the work site immediately upon completion of the work of this contract.
- G. Fire Extinguishers: Comply with the applicable recommendation of NFPA Standard 10 "Standard For Portable Fire Extinguishers." Locate fire extinguishers where they are most convenient and effective for their intended purpose, but provide no less than one extinguisher in each corner of each Work Area, in the Equipment Room, and one outside each Work Area in Clean Room.

1.13 PERSONNEL PROTECTION

- A. The Contractor shall provide personnel protection as required by all applicable regulations.
- B. Respirators, disposable coveralls, head covers, and footwear covers shall be provided by the Contractor for the Consultant and other authorized visitors who may inspect the job site.
- C. Require that workers NOT eat, drink, smoke, chew gum or tobacco, or use toilet facilities (either existing or temporary) in the Work Area. To eat, chew, drink or smoke, workers shall dress in street clothes before entering the non-Work Areas of the building.
- D. Post written procedures in work place and train all personnel on the procedures for the evacuation of the injured and the handling of potential fires. Provide aid to a seriously injured worker without delay for decontamination. Make provisions to minimize exposure of rescue workers and to minimize spreading of contamination during evacuations and fire procedures.
- E. The Contractor shall instruct all employees and workers in the proper care of their personally issued respiratory equipment, including daily maintenance, sanitizing procedures, and personal decontamination procedures to be utilized upon leaving the Work Area.

1.14 FIRE PROTECTION AND FIRE PREVENTION

- A. The Contractor shall notify the Town of Swampscott Fire Department (SFD) in advance of any work performed. Notifications shall be made prior to storage or installation of Contractor's materials on the Owner's property.
- B. Fire Protection:
 - 1. The Contractor shall provide adequate temporary fire protection. Ample multi-purpose dry chemical portable fire extinguishers, having an extinguishing rating of at least 4A:40BC, shall be distributed throughout the premises. Pressurized water extinguishers of 2-1/2 gallon capacity shall supplement the multi-purpose dry chemical extinguishers where necessary. Firefighting

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equipment shall be conspicuously located and readily accessible at all times, and be maintained in operating condition.

2. A fire brigade shall be organized and trained by the Contractor in the use of portable fire extinguishers and small hose. The firefighting program is to be followed throughout all phases of construction or demolition work involved.
3. Access for the SFD shall be provided and maintained readily accessible at all times.

C. Fire Prevention:

1. Flammable and Combustible Liquids

- a. Only approved containers and portable tanks shall be used for storage and handling of flammable or combustible liquids. All containers and tanks shall be Underwriter's Laboratories listed. Safety cans shall be equipped with flame arresters.
- b. Flammable and combustible liquids shall be kept in closed containers when not actually in use.
- c. No more than one day's working supply shall be allowed inside the building at any time. Flammable or combustible liquids shall be stored in approved flammable liquids storage cabinet with no more than 60-gallons of such liquid stored in any one cabinet. No more than three storage cabinets are to be located in a single storage area.
- d. Conspicuous and legible signs prohibiting smoking or use of open flames shall be posted in areas where the liquids are being dispensed, used, or stored.

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3. Hazardous Operations

- a. Hazardous operations shall not be performed until the necessary special fire protection (e.g., portable fire extinguishers, small water hose) is in service.

4. Housekeeping

- a. Combustible waste material and rubbish shall not be stored or allowed to accumulate within the building or in the immediate vicinity, but shall be removed from the premises as rapidly as practicable, i.e., at least once a day and more frequently if conditions indicate the need.
- b. Materials subjected to spontaneous ignition such as oily waste and paint rags shall be placed in approved self-closing waste containers after use and disposed of each day.
- c. Combustible materials shall be kept at a minimum by implementing a carefully scheduled plan for delivery of such material.
- d. If crating and packing materials holding supplies and equipment are combustible, the equipment shall be uncrated and unpacked as soon as possible after arrival at the site. Combustible packing and crating shall be safely disposed.

5. Smoking

- a. Smoking shall be prohibited in work areas and in the vicinity of hazardous operations or materials.
- b. Where smoking is allowed, it shall be so noted, and safe receptacles shall be provided for smoking materials.

PART 2 - PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. The Contractor shall deliver all materials and equipment to the Site in original containers bearing the name of the manufacturer, and details for proper storage and usage.
- B. All chemicals used during the Work shall be reviewed by the Consultant prior to being brought on site.
- C. All materials or equipment delivered to the site shall be unloaded, temporarily stored, and transferred to the Work Area in a manner which shall not interfere with building operations.
- D. Unloading and temporary storage sites, and transfer routes, must be reviewed in advance by the Consultant.
- E. Damaged or deteriorated materials may not be used and must be promptly removed from the premises. Material which becomes contaminated with ACM shall be packaged and legally disposed as ACM.

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- F. At minimum, all materials, tools, and equipment must comply with this Specification and relevant federal, state, and local codes.

2.02 MATERIALS, TOOLS, AND EQUIPMENT

- A. Negative Air Machines: Supply the required number of asbestos air filtration units to the Site in accordance with these Specifications. Each unit shall include the following:
 - 1. Cabinet: Constructed of steel or other durable materials able to withstand damage from rough handling and transportation. The width of the cabinet should be less than 30 inches to fit through standard-size doorways. Cabinet shall be factory sealed to prevent asbestos-containing dust from being released during use, transport, or maintenance. Access to and replacement of all air filters shall be from intake end. Unit shall be mounted on casters or wheels.
 - 2. Fans: Rate capacity of fan according to useable air-moving capacity under actual operating conditions. Use centrifugal-type fan.
 - 3. HEPA Filters: The final filter shall be the HEPA type. The filter media (folded into closely pleated panels) must be completely sealed on all edges with a structurally rigid frame.
 - a. A continuous rubber gasket shall be located between the filter and the filter housing to form a tight seal.
 - b. Each filter shall be individually tested and certified by the manufacturer to have an efficiency of not less than 99.97 percent when challenged with 0.3 um dioctylphthalate (DOP) particles. Testing shall be in accordance with Military Standard Number 282 and Army Instructions Manual 136-300-175A. Each filter shall bear a UL586 label to indicate ability to perform under specified conditions.
 - c. Each filter shall be marked with: the name of the manufacturer, serial number, airflow rating, efficiency and resistance, and the direction of test airflow.
 - 4. Prefilters, which protect the final filter by removing the larger particles, are required to prolong the operating life of the HEPA filter. Two stages of pre-filtration are required. The first-stage prefilter shall be a low-efficiency type (e.g., for particles 10 um and larger). The second-stage (or intermediate) filter shall have efficiency effective for particles down to 5 um. Prefilters and intermediate filters shall be installed either on or in the intake grid of the unit and held in place with special housings or clamps.
 - 5. Instrumentation: Each unit shall be equipped with a magnahelic gauge or manometer to measure the pressure drop across filters and indicate when filters have become loaded and need to be changed. A table indicating the useable air-handling capacity for various static pressure reading on the magnahelic gauge shall be affixed near the gauge for reference or the magnahelic reading indicating at what point the filters should be changed, noting Cubic Feet per Minute (CFM) air delivery at the point.

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6. Provide units equipped with an elapsed time meter to show the total accumulated hours of operation.
7. Safety and Warning Devices: The unit shall have an electrical (or mechanical) lockout to prevent fan from operating without a HEPA filter or with a filter installed backwards. Units shall be equipped with automatic shutdown system to stop fan in the event of a major rupture in the HEPA filter or blocked air discharge. Warning lights and audible alarms are required to indicate normal operation, too high a pressure drop across the filters (e.g., filter overloading), and too low of a pressure drop (e.g., major rupture in HEPA filter or obstructed discharge).
8. Flexible hoses (ducts) of sufficient length must be provided to allow the units to discharge to the building exterior.
9. Electrical components shall be approved by the National Electrical Manufacturers Association (NEMA) and Underwriter's Laboratories (UL). Each unit shall be equipped with overload protection sized for the equipment. The motor, fan, fan housing, and cabinet shall be grounded.

B. Respiratory Protection Equipment:

1. Air Purifying Respirators: Provide, at a minimum, P100 type filters labeled with NIOSH Certification for "Radionuclides, Radon Daughters, Dust, Fumes, Mists including Asbestos-Containing Dusts and Mists" and color coded in accordance with ANSI Z228.2 (1980). In addition, a chemical cartridge section may be added, if required, for solvents, etc., in use. In this case, provide cartridges that have each section of the combination canister labeled with the appropriate color code and NIOSH Certification. A change-out schedule for respirator cartridges used shall be maintained on site.
- C. Wetting Agents: For wetting prior to ACM disturbance and during abatement procedures use amended water. The surfactant material must be odorless, non-flammable, non-toxic, non-irritating, and non-carcinogenic. Amended water shall be applied as a mist using a low-pressure sprayer recommended by the manufacturer. Use a mixture of surfactant and water which results in wetting of the ACM and retardation of fiber release during disturbance of the material equal to or greater than that provided by the use of one ounce of a surfactant consisting of 50% polyoxyethylene ester and 50% polyoxyethylene ether mixed with five gallons of water or as specified by the manufacturer.
- D. Lock-Down Encapsulant: Provide penetrating or lock-down type encapsulants specifically designed for the use intended. The material shall not contain organic solvents and be non-flammable, non-toxic, non-irritating, and non-carcinogenic.
- F. Polyethylene Sheeting: Provide flame retardant polyethylene sheeting that conforms to requirements set forth by the National Fire Protection Association Standard 701, Small Scale Fire Test for Flame-resistant Textiles and Films. Provide largest size possible to minimize seams, 6-mil thickness as required, frosted or black as indicated.
- G. Waste Containers: Provide 6-mil thickness leak-tight polyethylene bags labeled in accordance with EPA's NESHAPS, OSHA, and DOT regulations. If the waste material contains sharp edges or may

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otherwise puncture polyethylene bags, provide properly labeled fiber drums or other closed, puncture resistant containers for storage, transportation, and disposal.

- H. Filters: Provide cascaded filter units on drain lines from showers or any other water source carrying asbestos-contaminated water from the Work Area. Provide units with disposable filter elements as indicated below. Connect so that discharged water passes through primary filter and output of primary filter passes through secondary filter.

Primary Filter - Pass particles 20 microns and smaller

Secondary Filter - Pass particles 5 microns and smaller.

- I. Hand or Machine Powered Tools: Must be equipped with HEPA-filtered local exhaust ventilation if used to drill, cut into, or otherwise disturb ACM.
- J. Pressure-Differential Recorder: Provide air pressure sensing devices equipped with recorders for continuous monitoring of Work Area pressure differential. Provide sufficient quantities of chart paper and maintain devices until completion of Work.
- K. Two Way Radios: Provide General Superintendent and all Work Area Supervisors and Foremen with compatible two-way radios. Provide Consultant with compatible two-way radio.
- L. Lumber and Plywood: All lumber and plywood used for temporary barriers, tunnels, platforms, and Decontamination Facilities shall be new and of fire retardant grade to comply with the requirement for a flame spread of 25 or less with no evidence of significant progressive combustion when tested for thirty minutes duration under the Standard Test Method for surface burning characteristics of building materials (ASTM E-84, NFPA 255, UL 723 and AWWA C-20 and C-27). Lumber shall have minimum dimensions of 2" x 4" or as specified. Tongue and groove plywood shall be minimum 3/4-inch thickness, other plywood shall be minimum 1/2-inch thickness.
- M. Vacuum Cleaning Equipment: Shall be industrial type designed for such use, equipped with HEPA filters. The equipment shall not be used to remove water and shall be properly operated at all times. Each vacuum cleaner shall be emptied and thoroughly cleaned inside the work area at the conclusion of the project cleaning stage.

PART 3 - EXECUTION

3.01 SITE MEETING

- A. Site Meeting: Upon receipt of the Notice to Proceed, the Contractor shall identify at least one Project Supervisor, (or the official Contractor's Representative) for meeting at the Site with Owner, and the Owner's designated representative. The purpose of this meeting is to determine:
 - 1. Confirmation of the actual quantities (SF) of ACM to be removed and a detailed schedule for performing the required work.
 - 2. The estimated ACM quantities to be generated; on-site waste storage areas; and waste removal sequencing.

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3. Contractor and supporting vendor vehicle access and parking.
4. Contractor access to the work area, including approved doors, stairways. The most appropriate method of isolating the work areas while maintaining access.
5. Determination of all equipment and other movable items to be removed from the work area by the Contractor, and the location of temporary storage space.
6. Location, size, manner of construction, and use of containment critical barriers and Decontamination Facilities.
7. Any other technical issues or logistical factors to minimize interference Owner's operations and facilitate Contractor activities.

3.02 WORK AREA PREPARATION

- A. The Contractor shall prepare each Work Area as described in this Section. Preparation Work shall be performed according to the following general sequence of steps and procedures to insure that proper containment and protection systems are installed prior to any Work which could disturb asbestos-containing materials and generate airborne asbestos fibers.
- B. Cover any windows, glass doors, or other openings; erect any required barriers, coverings, tunnels, or access platforms; post access restriction signs; seal all openings into the Work Area; install any temporary access openings.
- C. Erect Decontamination Facilities and install HEPA exhaust units.
- D. Isolate all building electrical systems, and provide temporary power and lighting as required for Work Areas.
- E. Carefully clean all surfaces in the Work Area which may be contaminated with any dust or debris.
- F. Cover walls, floors, and other fixed items not included in the asbestos-abatement work with two layers of 6-mil fire retardant polyethylene sheeting.
- G. Obtain Owner's representative's acceptance of all preparation work before starting pre-cleaning or removal of asbestos materials.

3.03 ELECTRICAL ISOLATION, AND TEMPORARY POWER AND LIGHTING

- A. The scope of the required electrical isolation and protection work includes isolation and protection of electrical equipment which is in areas where asbestos removal work must be performed, and could therefore possibly become a hazard through contact or short-circuiting in a wet environment. The Work shall also include providing labor to install, monitor, inspect, and service temporary power circuits, lighting, and equipment as required by local codes and regulations.

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- B. The electrical isolation Work also includes the shutdown of all electrical and lighting circuits in the Work Areas and installation of temporary lighting and power with ground fault protection circuitry in accordance with applicable codes.
- C. Temporary light shall be provided by the Contractor in all Work Areas where asbestos removal is performed.
- D. Temporary lighting and power systems shall comply with all OSHA, state, and local regulations.
- E. The Contractor is responsible for providing a safe condition, verifying existing electrical conditions and determining isolation requirements.
- F. The Contractor shall be required to furnish, without additional expense, all transportation, labor, and materials necessary to maintain the electrical systems for a safe operation, and to maintain service in areas abutting Work Areas in compliance with codes.
- G. All Contractor costs associated with the isolation of electrical systems and installations of temporary power and lighting must be included in the bid submittal.
- H. The Contractor shall provide AC power for the Owner's representative to collect and analyze air samples. The AC power shall be provided to locations determined by the Owner's representative.

3.04 WORK AREA ISOLATION AND DECONTAMINATION FACILITIES

A. Work Area Isolation and Protection:

1. The Contractor shall isolate each Work Area for the duration of Work by completely closing and sealing all openings and doorways into the Work Area including, but not limited to doorways, corridors, windows, floors and ceiling penetrations, and lighting. Critical isolation/sealing shall be accomplished by using two layers of 6-mil plastic sheeting taped securely in place, or by caulking, including temporary construction as noted below. The Work Area shall be protected and sealed airtight to the extent possible, and be subject to the inspection of the Owner's representative.
2. Emergency and fire exits shall be clearly marked and maintained, or alternative exits shall be established in accordance with applicable codes and regulations. Exits shall be checked daily against blockages or impediments to exiting. Entrances which shall not be used by workers shall be locked against unauthorized entry.
 - a. Arrange exit door(s) so that it is secure from outside the Work Area but permits exiting from the Work Area.
 - b. Mark outline of door on Primary and Critical Barriers with luminescent paint at least 1-inch wide. Hang a razor knife on a string beside outline. Arrange Critical and Primary barriers so that they can be easily cut with one pass of razor knife. Paint words "EMERGENCY EXIT" inside outline with luminescent paint in letters at least one foot high and 2-inches thick.

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- c. Paint arrows on walls and floor with luminescent paint to direct workers to nearest emergency exit.
3. Isolation Partitions and Barriers - Open doorways, cased openings, shall be sealed airtight with temporary structural partitions as follows:
 - a. Erect wood or metal studs, and then cover the opening with 1/2-inch plywood sheeting (or equivalent) on Work Area side only.
 - b. Cover the work side of this partition with a double layer of plastic sheeting with joints staggered and sealed with tape partition at floor, walls, ceiling, and all joints shall be caulked airtight.
4. Construct rigid enclosures and install Decontamination Facilities as required.
5. Provide temporary power and lighting to Work Area, and ensure safe installation of temporary power sources and equipment per applicable electrical code requirements and OSHA requirements for temporary lighting in an environment normal to asbestos abatement Work Areas.
6. Thoroughly pre-clean all dust or debris from any fixed objects, floors, or other equipment within the Work Area using HEPA-vacuuuming equipment and/or wet washing. Do not use brooms, brushes, mops, or non-HEPA vacuum cleaners for this pre-cleaning work. Seal all seams, joints, covers or casings with tape, and enclose fixed objects or equipment with a minimum of two layers of 6-mil plastic sheeting secured and sealed airtight with duct tape.
7. Floor drains or other openings shall be sealed individually with two layers of 6-mil sheeting and tape. Pits, sumps, and other openings shall be covered with plywood sheathing secured so as to prevent a tripping hazard and then covered with two layers of 6-mil sheeting.

B. Exposure Controls and HEPA-Filtered Exhaust Ventilation

1. The Contractor shall install inside each Work Area one or more portable HEPA-filtered exhaust units to maintain the area, including the Decontamination Facilities, under negative air pressure, and to reduce or control airborne asbestos fiber concentrations. Unless otherwise permitted by the Owner's representative, exhaust systems shall be operated twenty-four hours per day at all times during preparation, removal, encapsulation, and cleanup tasks as specified herein; and until final "clean air" certification is obtained for the area.
2. Each exhaust unit shall be equipped as described in Part 2.02. Each unit shall be serviced by a dedicated minimum 115V-20A circuit with overload device tied into an existing building electrical panel or temporary service panel which has sufficient spare capacity to accommodate the load of all negative air units connected. Dedication of an existing circuit may be accomplished by shutting down existing loads on the circuit.
3. The exhaust system must be capable of providing: 1) at least four (4) full air changes per hour in each Work Area; 2) an inward velocity through any openings, including the Decontamination

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Facilities, of at least 200 fpm; and 3) a static negative air pressure inside the area of a minimum of 0.02 inches water column relative to the outside air.

4. Add a minimum of one (1) additional unit for every eight (8) units serving a work area as a backup in case of equipment failure or machine shutdown for filter changing.
5. All exhaust air shall pass through HEPA-filters before being discharged to the building exterior. The Contractor shall securely install (and seal with caulking) a solid window or door insert with 12-inch diameter cutout for the discharge air from each HEPA-exhaust unit. The exterior exhaust discharge point shall be at least 40 feet from a receptor such as an air intake port, louvers, or building entrances.
6. Locate exhaust unit(s) so that makeup air enters Work Area primarily through Decontamination Facilities and traverses Work Area as much as possible. This may be accomplished by positioning the exhaust unit(s) at a maximum distance from the worker access opening or other makeup air sources.
7. If there are multiple sealed areas or partition walls within a Work Area, the exhaust systems shall be arranged so that air flows from the least to most contaminated area, and to prevent spaces from having poor or dead air movement.
8. Provide supplemental make-up air inlets where required for proper airflow through the Work Area. Additional make-up air shall be delivered through horizontal shutters which open on make-up air inflow and seal on air flow cessation, or is delivered through a HEPA-filtered supply fan system.
9. Testing the system: Test the negative pressure system before ACM is wetted or removed. After the Work Area has been prepared, the Decontamination Facility constructed, and the exhaust unit(s) installed, start the unit(s) one at a time. Demonstrate operation and testing of negative pressure system to the Consultant. Demonstrating and testing the operation of the negative pressure system will include, but not be limited to, the following:
 - a. Plastic barriers and sheeting move lightly in toward Work Area.
 - b. There is a noticeable movement of air through the Decontamination Facility. Use smoke tubes to demonstrate air movement from Clean Room to Shower Room, from Shower Room to Equipment Room, and from Equipment Room to Work Area.
 - c. Use a differential pressure meter or manometer to demonstrate a pressure difference of at least -0.02 inches of water across every barrier separating the Work Area from the remainder of the building or outside air.
10. Use of System During Abatement Operations:
 - a. Start exhaust units before beginning Work (before ACM is disturbed). After abatement work has begun, operate units continuously to maintain a constant negative pressure until Work Area decontamination is completed and successful clearance air sampling has been

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completed. Do not shut down HEPA turn off units at the end of the work shift or when abatement operations temporarily stop.

- b. Start abatement work at a location farthest from the exhaust units and proceed toward them.
 - c. At completion of abatement Work, allow exhaust units to operate to remove airborne fibers that may have been generated during abatement Work and cleanup and to purge the Work Area with clean makeup air.
11. On loss of negative air pressure or electric power, all work activities in the Work Area shall immediately stop and shall not resume until power is restored and the HEPA-exhaust systems are operating properly. When power failure or loss of negative pressure lasts, or is expected to last, longer than one hour, then the following shall occur:
- a. Make-up air inlets in the Decontamination Facility shall be sealed airtight;
 - b. Decontamination Facility shall be sealed airtight after the evacuation of all personnel from the Work Area; and
 - c. All adjacent areas shall be monitored for asbestos fiber concentration upon discovery of, and subsequently throughout, the power failure or loss of negative pressure.
 - d. The Contractor shall request that the Consultant inspect the work area prior to the re-start of work.
12. Monitoring: Continuously monitor and record pressure differential between the Work Area and building outside the Work Area with a monitoring device incorporating a continuous strip chart recorder. Meter shall be equipped with a warning buzzer which will sound if pressure differential drops above -0.02-inches of water. The monitor shall be located at a point convenient for observation. The strip chart will be included in the project documentation.
13. On a weekly basis, submit printout from pressure differential monitoring equipment to the Consultant. Mark printouts with location, date and start of time for each day. Use printout paper that indicates elapsed time in intervals no greater than hours. Indicate on each days' record times of starting and stopping abatement Work, type of Work in progress, breaks for lunch and other purposes, periods of stop Work, and filter changes. Cut printouts into segments by day, attach to 8 1/2-inch x 11-inch paper. Label with Project name, Contractor's name and date.

C. Decontamination Facilities

1. For Class II asbestos work operations where exposures exceed a PEL, or where there is no NEA produced before the project, the Contractor shall provide the following:
 - a. Equipment Room: Provide Equipment Room with airlocks to the Work Area and Shower Room, large enough for all workers to remove and dispose contaminated protective clothing, and for storage of contaminated Contractor equipment.

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- b. Shower Room: Provide a completely watertight operational shower to be used for transit by cleanly dressed workers heading for the Work Area from the Changing Room, or for showering by workers headed out of the Work Area after undressing in the Equipment Room. The shower room facilities and size shall be adequate to allow decontamination and thorough washing of all the workers and visitors within the 30 minute escape time allowed under air compressor failure (if Type C Supplied Air Respirators are used). Provide 20 micron and 5 micron wastewater filters in line to drain. Change filters daily or more often if necessary. Locate filters inside shower unit so that water lost during filter changes is caught by shower pan.
 - c. Clean Room: Provide a room that is physically and visually separated from the Work Area for the purpose of changing into protective clothing. Locate so that access to Work Area from Clean Room is through Shower Room. Do not allow asbestos-contaminated items to enter this room. Maintain floor of changing room dry and clean at all times. Do not allow overflow water from shower to enter changing room.
3. Construction: Decontamination Facilities shall be located in areas acceptable to the Consultant. Construction shall have load-bearing capabilities if required to support workers overhead.
 4. The Contractor shall post or have available the following items in each clean room of the worker Decontamination Facility.
 - a. A copy of EPA NESHAPs, Title 40 CFR, Part 61 Subparts A and M.
 - b. a copy of EPA AHERA, Title 40 CFR, Part 763, Subpart E.
 - c. a copy of OSHA regulations, Title 29 CFR, Part 1926.1101.
 - d. a copy of DOT regulations Title 49 CFR, Parts 172 and 173.
 - e. A copy of MADLS 453 CMR 6.00.
 - f. A copy of MassDEP 310 CMR, 7.00, 7.15 and 19.000.
 - g. A list of telephone numbers for local hospital, location of hospital and/or emergency squad, local fire and police departments, and the name and the Consultant's telephone number.
 - h. A copy of the asbestos abatement Specifications and Drawings.
 - i. A copy of the written respiratory protection program that conforms to OSHA requirements.
 - j. A listing of all employees working on the Project by name, social security number and MADLS Certification Number.
 - k. A daily sign in/out log which identifies persons by name and MADLS Certification Number, who are/were at the Site, and the length of the time each spent at the Site.

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5. A solid, hinged door with a single cylinder dead-bolt lock shall be installed at the outside entrance to each Decontamination Facility. Provide a shutter which opens on make-up air inflow and seals on air flow cessation. This door shall be closed and locked whenever the Work Area is unattended.
6. Ensure that barriers and plastic linings are effectively sealed and taped at all times, and that the Shower Room floor is watertight. Repair damaged barriers, and remedy defects immediately upon discovery. Visually inspect the facility at the beginning of each work period. The Consultant shall also be allowed to use smoke generators to test effectiveness of barriers, flow of air through the Decontamination Facility and HEPA-exhaust systems.
7. Maintain emergency and fire exits from the Work Area, or establish alternative exits satisfactory to local fire officials and the Consultant. Exits shall be checked daily for exterior blockages or impediments to exiting.
8. Warning Signs: The Contractor shall post warning signs meeting the requirements of OSHA Title 29 CFR, Part 1926.1101 at the outside doorway to the Decontamination Facility which shall be the only non-emergency entrance into the Work Area. The Consultant may also request that the Contractor post additional warning signs around the Work Area or at other potential entrances or exposure points. Warning signs shall be readily visible to any person attempting to enter the Work Area.
9. Equipment and Waste Decontamination Facility: Where space allows, provide a separate Decontamination Facility consisting of a serial arrangement of rooms, Holding area, and Wash Room for removal of equipment and material from the Work Area. At **NO** time will personnel be allowed to enter or exit Work Area through the Equipment/Waste Decontamination Facility.
10. Access Restrictions: The Contractor shall restrict access to Work Area to persons who have previously been identified to the Consultant; or persons who have legal jurisdiction over the Work. The Contractor's Supervisor shall at all times monitor the entrance to the Decontamination Facility to prevent unauthorized people from entering, and to maintain a written log of all people entering the Work Area.

3.05 APPROVAL OF WORK AREA PREPARATION

After each asbestos removal Work Area has been prepared as specified above, the Contractor shall request a formal pre-abatement site inspection by the Consultant. No removal, demolition, or other ACM disturbance shall occur until the Consultant has inspected and accepted the site preparation Work.

3.06 CLEANING OF ASBESTOS-CONTAMINATED SURFACES

- A. This Section pertains to the cleaning of surfaces which are potentially contaminated with asbestos-containing dust and debris as stated in the Description of Work, or discovered in the performance of the specified Work. Such cleaning shall be required to prevent this dust from becoming airborne and posing an exposure risk to building occupants or interfering in air monitoring activities. Cleaning actions shall be performed as after the work area is isolated as a preliminary exposure control procedures prior to performing other actions which are required. Cleaning shall consist of

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HEPA-vacuuuming followed by wet wiping (if necessary) of surfaces in a manner which prevents dust generation but effectively rids the surface of all visible debris, dust, film and grime. Request Consultant to conduct pre-cleaning final inspection prior to performing any other specified actions

- B. Each HEPA-vacuum cleaner shall be separately equipped with an airtight, securely attached hose, of proper length, and a collection wand, brush, and other special attachments appropriate to the required cleaning tasks. The equipment shall be properly operated at all times and shall contain no air leaks. The Consultant may inspect all vacuuming equipment prior to its use, and may request verification of the efficiency of the equipment's filtration.

3.07 ASBESTOS REMOVAL IN A NEGATIVE PRESSURE ENCLOSURE

- A. This Section covers the ACM removal where conducted inside of negative pressure enclosure (NPE) equipped with a three-chambered Decontamination Facility.
- B. Amended water (wetting agent), mixed and carefully applied using an airless sprayer as specified by the manufacturer, shall continuously be used to control the release of asbestos fibers from the ACM material prior to and during removal. The amended water shall be applied in sufficient quantity to fully penetrate and saturate asbestos containing materials before removal begins.

C. Removal Methods:

1. ACM

- a. No asbestos removal Work shall begin until the Work Area has been prepared to the satisfaction of the Consultant as summarized in preceding Sections.
- b. Small test patches of ACM shall be wetted, and then removed and examined to determine degree of saturation prior to removing the bulk of the material. Use of pressure washers is not permitted for the gross removal of asbestos containing materials.
- c. After asbestos materials have been fully wetted and tested, the asbestos shall be carefully removed in small sections using suitable tools and equipment as accepted in the Contractor's Plan of Action.
- d. As the material is removed, it shall be promptly wetted and packed into impermeable, labeled 6-mil polyethylene disposal bags and/or approved disposable drums. When each bag is full, the packaged material shall be sprayed with amended water, sealed, and transported to a temporary storage area inside of the Work Area. Accumulations of standing or free water shall not be allowed to collect on the Work Area floor.
- e. If the asbestos material is located on surfaces higher than 15 feet above the floor, the Contractor shall provide closed chutes (with maximum incline of 60 degrees from horizontal), or scaffolding for waste containers to prevent dropping material down to the floor during removal.
- f. The Contractor shall repeatedly mist the Work Area with an airless sprayer and spray all ACM with amended water to prevent it from drying out. The Contractor shall repeatedly

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and continuously mist the Work Area during all asbestos removal and related operations to reduce airborne dust and fiber levels.

- g. Once the majority of the asbestos is removed, the Contractor shall use approved tools and methods to remove all remaining visible and microscopically detectable material.
- h. The Contractor shall minimize contamination of the work area, the exterior of disposal containers, and all other surfaces within the Work Area. At the end of each shift, all surfaces shall be cleaned of all materials and then HEPA-vacuumed or wet mopped and all debris packaged in 6-mil polyethylene bags.
- i. Excessive water accumulation or flooding in the Work Area shall require Work to stop until the water is collected and disposed of properly.

3.08 ASBESTOS WASTE DISPOSAL PROCEDURES

A. The Contractor shall package, label, and remove all asbestos waste from the Work Area as specified below. Packaging shall be accomplished in a manner that minimizes waste volume, but insures waste containers shall not tear or break. Transportation and disposal of the containerized waste at a landfill previously accepted by the Consultant shall be the responsibility of the Contractor. In accordance with 453 CMR 6.00 and 310 CMR 7.15, the Contractor shall provide written notification to the MassDEP and MADLS 10 business days in advance of the intent to dispose of asbestos waste from the site.

B. Waste Labeling:

- 1. Warning labels, having waterproof print and permanent adhesive in compliance with OSHA, EPA and Department of Transportation requirements, shall be affixed to or printed on the sides of all waste bags or transfer containers. Warning labels shall be conspicuous and legible.
- 2. In compliance with EPA NESHAPS, 40 CFR, Part 61.150, all waste containers or bags shall be labeled in accordance with applicable regulations and include the following:

Name and address of Owner: (i.e., Owner)
Name and address of waste generator, and
Location of where waste was generated.

C. Wetting of Waste: A fine water spray shall be used to keep the top layers of waste in containers thoroughly wet at all times. When a waste bag is full, air within the bags shall be evacuated with a HEPA-equipped vacuum and be securely sealed with tape or other secure fastener.

D. Waste Container Decontamination and Removal Procedures: The following procedures shall be followed whenever containers or equipment are removed from the Work Area through the personnel Decontamination Facility.

- 1. The Clean Room shall be considered a holding area only during the period of active waste transfer for the purpose of the loading of carts or drums. Storage of waste and carts (or drums) in the clean room is prohibited.

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2. Waste removal shall not occur during worker shift changes or when workers are showering or changing. Care shall be taken to prevent short-circuiting and cycling of air outward through the Shower and Clean Room when used for waste removal.
3. Workers are to be stationed in each room/area of the Decontamination Facility to transfer the containers and equipment to or from adjacent sections. These workers shall not cross the airlocks into the adjacent areas/rooms until the waste or equipment transfer is finished for that period and the workers have gone through decontamination as required by these Specifications. The workers in the Clean Room or holding area shall enter from uncontaminated areas with appropriate PPE; or prior to the start of waste transfer, these workers shall exit the Work Area, fully decontaminated, and subsequently don clean PPE.
4. External surfaces of contaminated containers and equipment shall be cleaned by wet cleaning or HEPA vacuuming or both in the Work Area before moving such items into the Decontamination Facility airlock. Workers shall not enter the airlock during this procedure.
5. The waste containers and the equipment shall be removed from the airlock by workers stationed in the Shower during waste removal operations.
6. Once in the Shower, external surfaces of contaminated containers and equipment shall be cleaned a second time by wet cleaning.
7. The cleaned containers of waste and equipment shall be placed in uncontaminated leak-tight plastic bags (or fiber drums for sharp-edged components). Air volumes shall be minimized, and the bags or drums shall be sealed.
8. The clean re-containerized items shall be moved into the airlock for subsequent transfer to the holding area. The Shower workers shall not enter this airlock or the Work Area until waste removal is finished for the period.
9. Re-containerized items and cleaned equipment shall be removed from the airlock to the holding area by workers who have entered from uncontaminated areas with appropriate PPE.
10. The re-containerized items of waste and cleaned, bagged equipment shall be placed in closed top, watertight plastic carts or drums. These carts or drums shall be held in the holding area pending removal. The carts or drums shall be HEPA-vacuumed or wet-cleaned following the removal of the containers of waste from them.
11. The exit from the Decontamination Facility shall be monitored and secured at all times to prevent unauthorized entry.
12. The Decontamination Facility shall be wet cleaned using approved methods upon completion of any waste removal.
13. The carts or drums may be temporarily stored in a holding area at the Site outside the workplace until a transport vehicle arrives, but such storage areas must be acceptable to the Consultant.

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- E. Waste Container Storage: The container used for the storage of containerized contaminated waste shall be an enclosed dumpster. Dumpsters shall have a solid metal roof and a solid metal door with padlock. Line the cargo area with two layers of a 6-mil polyethylene sheeting to prevent contamination from damaged or leaking containers. Floor sheeting shall be installed first and shall extend up the sidewalls 24 inches minimum. Wall sheeting shall be overlapped and taped securely into place. No unbagged contaminated waste or non-asbestos waste shall be stored in these dumpsters. Ensure that bags placed in dumpsters are undamaged. Warning signs shall be posted on the dumpster in accordance with OSHA Title 29 CFR, Part 1926.1101.
- F. Waste Removal: All waste containers generated during bulk asbestos removal operations shall be decontaminated and removed from the work area before final cleanup is started and isolation barriers are removed. The Contractor shall complete an asbestos waste shipping record (WSR) including description and quantity of all ACM for each load of waste as required by NESHAPS.
- G. Should the asbestos waste not be received by the disposal facility within applicable regulatory time frames, the Contractor shall be responsible for determining the location of the waste and reporting all information regarding the waste to the Consultant immediately.
- H. Waste Transportation And Disposal Regulations: It is the Contractor's responsibility to determine and insure that Contractor is complying with: 1) the applicable current waste handling regulations; and 2) the current regulations for transporting and disposing waste at each ultimate disposal landfill. The Contractor must comply fully with these regulations; and with all DOT, state, local, and EPA requirements. The Contractor's waste hauler and disposal subcontractor shall maintain a valid hazardous waste transporter's permit and identification number; and obtain, complete, and fully comply with any other local waste manifesting requirements.

3.09 FINE CLEANING AND DECONTAMINATION

- A. This Section applies to the fine cleaning of all work areas where ACM has been removed. After all ACM (or contaminated) have been removed, the Contractor shall remove all wastes and perform a thorough multi-stage final cleanup and decontamination of each work area. Final cleaning shall be performed only after all waste is packaged and removed, but prior to dismantling any barrier, decontamination facility, or protective coverings. Cleaning shall be subject to the Consultant's acceptance based on a visual inspection (including surface dust wipe tests if appropriate) and air testing. If deemed necessary by the Consultant, substrate cleanliness will be confirmed via collection of bulk samples for analysis via PLM and / or TEM. HEPA-exhaust systems shall operate continuously throughout the cleaning and air testing processes until the Consultant agrees to deactivation. The Contractor shall notify the Consultant in writing at least 12 hours in advance of the expected completion time of site cleaning to allow the Consultant to schedule clearance air sampling.
- B. Methods and Approvals: Cleaning methods shall be specified in the Contractor's Plan of Action & Standard Operating Procedures and acceptable to the Consultant. Approvals and sequencing shall consist of the following:
 - 1. Remove all visible accumulations of debris on the protective coverings on floors, walls, and other surfaces, and then HEPA vacuum all surfaces to pick up excess water and gross saturated debris.

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2. After HEPA-vacuuming, the Work Area air shall be lightly misted, and then all protective coverings on ceilings, walls, floors, and other items in the Work Area shall be wiped thoroughly clean.
3. After the Contractor has completed the above steps (1) and (2), Contractor shall request the Consultant to inspect the site.
4. If the Consultant observes any debris within the Work Area during the inspection, the Contractor shall perform additional cleanup and decontamination, as necessary, until the Consultant accepts the work (acceptance of the cleanliness of the work area is based solely on industry standards). However, the critical barrier walls, decontamination facilities, HEPA-exhaust systems, and primary isolation seals shall remain in place and in use.
5. After the Consultant accepts the cleaning, the Contractor shall apply penetrating encapsulant to all surfaces within the Work Area. The encapsulant shall then be allowed to dry and after the Consultant's review, slowly remove the upper layer of all protective poly coverings on walls and other surfaces and package them in 6-mil waste bags. These waste bags shall then be removed from the Work Area following the procedures described herein. The bottom layer of protective polyethylene coverings, the Decontamination Facilities, the HEPA exhaust systems and all barrier walls shall remain in place and in use.

3.10 AIR MONITORING BY CONSULTANT

- A. This paragraph describes air monitoring conducted by the Consultant to verify that the building beyond the Work Area and the outside environment remain uncontaminated. This Section also sets forth airborne fiber concentrations both inside and outside the Work Area as action levels, and describes the action required by the Contractor if an action level is met or exceeded. The Consultant will be conducting air monitoring during the Project in accordance with all applicable regulations.
- B. The Consultant will perform all area perimeter air sampling and analysis. Written reports of all air monitoring results will be provided to Owner.
- C. Personnel air monitoring required by OSHA is the sole responsibility of the Contractor.
- D. Work Area Isolation: The purpose of the Consultant's air monitoring will be to detect faults in the Work Area isolation such as:
 1. Contamination of the building outside of the Work Area with airborne fibers,
 2. Failure of filtration or rupture in the negative pressure system,
 3. Contamination of the exterior of the building with airborne fibers.
 4. Should any of the above occur, the Contractor shall immediately cease asbestos abatement activities until the fault is corrected. The Consultant has the authority to stop work for any

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contract or regulatory violation observed conducted by the Contractor at the Contractor's expense. Work shall not resume until authorized by the Consultant.

- E. Work Area Clearance: To determine if the elevated total airborne fiber concentrations encountered following abatement work have been reduced to the AHERA and MADLS re-occupancy standards, the Consultant will collect aggressive clearance air samples and analyze air per AHERA TEM methods.
- F. Airborne Fiber Concentrations:
 - 1. Inside Work Area: Maintain an average total airborne fiber concentration in the Work Area of less than 0.5 fibers/cc. If the total airborne fiber concentration rises above this figure for any sample collected and analyzed, the Contractor shall revise work procedures to lower the total airborne fiber concentration. If total airborne fiber concentrations exceed 1.0 fibers/cc for any period of time and if supplied air respiratory protection is not provided, cease all Work until air sampling and analysis indicate total airborne fiber concentrations are below 1.0 fibers/cc.
 - 2. Outside Work Area: If any air sample collected outside of the Work Area exceeds the established baseline of 0.010 fibers/cc, immediately and automatically stop all Work. If this air sample was collected inside the building and outside of the critical barriers around the Work Area, immediately erect new critical barriers as specified herein to isolate the affected area from the balance of the building. Erect critical barriers at the next existing structural isolation of the space involved (e.g., walls, ceilings, and floors).
 - a. Decontaminate the affected area in accordance with these Specifications.
 - b. Respiratory protection shall be worn in affected area until area is cleared for re-occupancy.
 - c. Leave critical barriers in place until completion of the Work and insure that the operation of the negative pressure system in the Work Area results in a flow of air from the balance of the building into the affected area.
 - d. If the exit from the Clean Room of the Decontamination Facility enters the affected area, establish a temporary Decontamination Facility consisting of a Shower Room and Changing Room as specified herein. After cleaning and decontamination of the affected area remove the Shower Room and leave the Changing Room in-place as an air lock.
 - e. After successful completion of a visual inspection in the Work Area by the Consultant, the Contractor shall remove critical barriers separating the Work Area from the affected area. Final air samples will be collected within the Work Area as set forth in Section 3.10(E).
- G. PCM Analytical Results: The following procedure will be used to resolve any disputes regarding fiber types when a project has been stopped due to excessive total airborne fiber concentrations. "Airborne Fibers" referred to above include all fibers regardless of composition as counted in the NIOSH 7400 Procedure. If Work has stopped due to elevated total airborne fiber concentrations, air samples will be secured in the same area by the Consultant for analysis by TEM. "Airborne Fibers" observed in samples analyzed by TEM will be only asbestos fibers, but of any diameter and length (asbestos "structures").

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3.11 AIR MONITORING BY CONTRACTOR

- A. The Contractor shall perform air monitoring as required to meet OSHA requirements for maintenance of Time Weighted Average (TWA) airborne fiber concentrations for types of respiratory protection provided. Consultant will not be performing air monitoring to meet these OSHA requirements.
- B. The sampler and analytical laboratory performing the analysis shall be an independent third-party not financially or managerially connected to the Contractor.
- C. The analytical laboratory shall be successfully participating in the AIHA/NIOSH Proficiency Analytical Testing (PAT) program and licensed by MADLS to perform such analysis.
- D. Numbers and frequencies of personal air sampling shall be as required by OSHA regulations, but not less than one (1) sample per eight (8) hour work shift during all phases of asbestos abatement (e.g., pre-cleaning, removal, cleaning, waste packaging and removal from the Work Area, etc.).
- E. Air sample analytical results shall be provided to the Consultant within twenty-four (24) hours of collection.
- F. The Contractor shall use a pre-approved chain-of-custody form for all personal air samples collected.

3.12 FINAL INSPECTION AND WORK AREA CLEARANCE

- A. Final clearance air sampling shall be conducted using aggressive air sampling techniques as specified in EPA AHERA Title 40 CFR Part 763.90(i)(3) and (4). The Contractor shall supply power for circulating fans and a leaf blower as directed by the Consultant during this final air sampling to ensure effective air circulation. The clearance air sampling shall consist of collecting TEM air samples inside and outside the Work area to establish final clearance in accordance with the AHERA standard. TEM air samples will be laboratory analyzed within 48-hours of collection.
- B. Surface wipe and/or bulk samples may also be collected and analyzed at the option of the Consultant to confirm that all microscopically detectable asbestos has been removed. If the results of the final air sampling are not satisfactory, the Contractor shall conduct thorough wet cleaning and/or HEPA vacuuming and repeat until the required decontamination levels are achieved. The Contractor shall bear all costs for additional cleaning until the area passes final air testing.
- C. After achieving the clearance level requirements as specified herein and as confirmed by the final inspections and sampling, the Contractor will be notified by the Consultant of work area clearance.
- D. After successful completion of the final clearance air sampling, the Contractor shall carefully remove the Decontamination Facility and any temporary barriers. The HEPA filtration units shall be removed only after all other items are removed. A sufficient number of HEPA-filtered vacuums shall be kept on-site during final disassembly work to cleanup any identified dust or debris.

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PART 4 – RESPONSIBILITY FOR DAMAGES, RESTORATION, ETC.

The Contractor shall promptly remedy all damage or loss to the Site or adjacent thereto caused in whole or in part by the Contractor, any subcontractor, or by anyone for whose acts any of them may be liable and for which the Contractor is responsible for, except damage or loss attributable to the acts and omissions of the Owner or Consultant or anyone directly or indirectly employed by either.

* END OF SECTION *

~~Attorney/Client Work Product~~ ~~Draft For Discussion Purposes Only~~
~~Privileged/Confidential Document~~

ATTACHMENT A
Indemnity Agreement

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INDEMNITY AGREEMENT

~~Contractor covenants and agrees to defend, protect, indemnify and hold harmless The Town of Swampscott Public Schools and ESIS Inc. Health, Safety & Environmental (Consultant), and their respective officers, directors, agents and employees, from and against each and every claim, demand or cause of action of any liability, cost, expense (including but not limited to reasonable attorney's fees) damage or loss in connection therewith, against The Town of Swampscott Public Schools and ESIS Inc. Health, Safety & Environmental (Consultant), and their respective officers, directors, agents and employees on account of personal injury or death or property damage caused by, arising out of, or in any way incidental to, or in connection with the performance of the work hereunder.~~

Contractor

Authorized Signature/Title

Date