

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. General provisions of the Contract, including General and Supplementary Conditions and Other Abatement Specification Sections, apply to the work of each of the Specification Sections.
- B. This section addresses abatement of asbestos-containing material (ACM) only.

1.2 PROJECT SCOPE-OF-WORK

- A. General: Furnish all labor, materials, equipment and perform all work required to safely remove, and otherwise abate as indicated herein, transport, and legally dispose of all asbestos-containing materials (ACM) listed in Table 1 below. The scope-of-work includes the removal, transport, and disposal of designated ACM at the Berlin High School and Hillside Middle School located in Berlin High School. All work is to be completed in accordance with the schedules stated herein, in the Contract Documents, and as designated by the *S.A.U. 3*(Owner). It is essential that all work be phased and scheduled as required to facilitate Owner’s renovation and upgrade work. All work is to be completed in strict accordance with applicable local, State of New Hampshire (State), and federal codes and regulations and the requirements stated in this specification and Contract Documents.
- B. Table 1 below includes the listing of ACM to be removed, packaged, transported, and disposed of in accordance with the Contract Documents.

TABLE 1

Building Material	Location	Approximate Quantity	EPA Category
Berlin Elementary School: 200 State Street Berlin, NH			
Lump Sum Price 1			
12” Floor tile and mastic	Hall in Front of storage, restrooms and weight room	558 square feet	Category I Nonfriable
Berlin High School 55 Willard Street Berlin, NH			
Lump Sum Price 2			
12” Floor tile and mastic	Room 501, 502, 503, 504, 505, 506, 507, 508, 512, 513 and Home Ec	8,144 square feet	Category I Nonfriable
Lump Sum Price 3			
12” Floor tile and mastic	Rooms STO, Nurse Mercier, Guidance, Conference, Dir, 500, English, 302 Resource, 301 Resource, CTE Offices, 300A, Library opposite 300A, Café Candy’s Office	4,774 square feet	Category I Nonfriable
Lump Sum Price 4			
12” Floor tile and mastic	Rooms Buss, Work Room 621, 600, 601, Language, 602, 603, 604, 605, 613, 609, 610, office, 615 and Math	9,650 square feet	Category I Nonfriable

- C. Reference full inspection reports for discussions and additional information and limitations of Owner survey. Quantities listed in Table 1 are approximate only and Contractor shall remove all ACM in the work areas.

1.3 WORK SCHEDULES

- A. All work shall be completed in accordance with the schedule requirements as indicated by the Owner and as stated in the Contract Documents. Start date to be coordinated between the owner, owners IH and contractor.
- B. All work shall be strictly coordinated and scheduled by the Contractor as indicated by and approved by Owner, the Owner's industrial hygiene consultant (IH Consultant). Work is to be phased as required to facilitate Owner operations and general occupancy of the site, Contractor must provide proposed daily schedules to Owner and IH Consultant for each phase of work and each Owner work request. Adequate advance notice shall be provided to Owner and the IH Consultant prior to any schedule changes. Start and completion dates for the work and specific phasing requirements not otherwise specified herein shall be submitted to Owner and IH Consultant for approval.

1.4 CONTRACTOR ESTIMATES

- A. Estimates: Contractor shall conduct necessary field measurements and site review as deemed necessary by Contractor to delineate the scope of work and site conditions prior to submittal of bid. Contractor shall note on bid any discrepancies between Contractor field measurements and listings of work stated herein. It is the responsibility of the Contractor to verify all project information and site conditions as necessary to satisfy the Contractor as to the requirements of the work for each specific phase of the project. The Contractor must notify Owner and the IH Consultant of any conflicting information or clarifications required for the preparation of any bids, estimates, and submittal documentation. Unless otherwise stated by Owner, the Contractor is responsible for the removal of all designated ACM at Owner facility, so designated by the Owner.

1.5 EXISTING CONDITIONS

- A. Prior to commencement of work, inspect areas in which work will be performed. Prepare a listing and photographs of damage to structure, surfaces, finishes, insulations, and equipment that could be misconstrued as damage resulting from the work. Contractor is responsible for all damages to equipment, furnishings, finishes and building surfaces in the work area and adjacent caused by the Contractor during the course of abatement and general housecleaning. Contractor is responsible for completing all repairs to damaged items/surfaces caused by the work. In addition, all tape, adhesive, and other staining and damage must be fully repaired by Contractor to meet or exceed existing conditions.

1.6 POTENTIAL ASBESTOS HAZARD

- A. The work site contains ACM. Review all site survey reports and conduct ongoing inspections of the work areas to identity potential hazardous material that may be encountered. Provide OSHA competent person to supervise and review work procedures and conduct ongoing work area inspections. Properly train all affected personnel at the job site based on the hazards and hazardous material to be encountered, impacted or disturbed including but not limited to ACM.
- B. The disturbance or dislocation of ACM may cause asbestos fibers to be released into the buildings

atmosphere, thereby creating potential health hazards to workmen and building occupants. Apprise all employers at site, workers, supervisory personnel, subcontractors and consultants who will be at the job site of the seriousness of the hazards, other possible site hazards, and of proper work procedures that must be followed.

- C. Where in the performance of the work, workers, supervisory personnel, subcontractors, or consultants may encounter, disturb, or otherwise function in the immediate vicinity of any identified asbestos-containing materials, take appropriate continuous measures as necessary to protect all building occupants from the potential hazard of exposure to airborne asbestos fibers and dust. Such measures shall include the procedures and methods described herein, and compliance with regulations of applicable federal, state and local agencies.
- D. Complete, and coordinate with Owner's Representative as applicable, all communication of hazards in strict accordance with 29 CFR 1926.1101 (k) and other applicable OSHA and State regulations. The contractor shall coordinate with Owner's Representative to review all existing inspection records and testing results as needed. Ensure that complete inspections of the space and affected materials have been completed of copies of inspection reports have been provided to the Owner, Contractor site supervisor and other affected contractors and subcontractors at the site as applicable. All site personnel working in areas containing ACM shall be apprised of the locations, types and quantities of ACM present and all such personnel shall be provided a minimum of asbestos awareness level training (for non asbestos contractors) or additional training as indicated herein. In the event that other suspect material are encountered (or previously inaccessible spaces are accessed) that are not identified in the inspection report as having been properly inventoried and testing, then immediately cease work that would impact such materials and notify Owner's Representative such that proper testing and inspection can be performed.

1.7 CONTRACTOR USE OF PREMISES

- A. General: The Contractor shall limit his use of the site to the work indicated, so as to allow for Owner operations and general construction activity. Confine operations at the site to the specified work areas of the Specification. Take all precautions necessary to protect the site, buildings, any occupants, and surrounding areas from work-related hazards during the construction period. Maintain building in a safe and structurally sound condition throughout the work. Maintain access to the public and other trades in designated areas (for example, stairwells) as indicated herein and as otherwise noted by Owner. Provide additional barriers and site security as needed to accommodate such access. Use care to prevent damages to existing surfaces during installation of solid barriers, critical barriers and primary isolation barriers.
- B. Install solid barriers to prevent unauthorized access and visibility from adjacent, public or Owner-occupied areas as designated by Owner and using materials and construction methods approved by Owner. Contractor shall work in cooperation with, and coordinate all work with Owner and the **IH Consultant**.

1.8 STOP WORK

- A. If Owner or the IH Consultant presents a written or verbal stop work order immediately and automatically stop all work. Do not recommence work until authorized in writing by Owner and IH Consultant.

1.9 PROJECT COORDINATION

- A. Site Supervisor: Provide a full-time Site Supervisor who is experienced in administration and supervision of asbestos abatement projects including work practices, protective measures for building and personnel, disposal procedures, etc. This person is the Contractor's Representative responsible for compliance with the specification and all applicable federal, state and local regulations, particularly those relating to asbestos-containing materials.
1. Experience and Training: The Site Supervisor must have completed a course at an EPA Training Center or equivalent certificate course in asbestos abatement procedures, and have had a minimum of five (5) years on-the-job training in similar asbestos abatement procedures.
 2. Accreditation/Qualifications: The Site Supervisor is to be (1) a Competent Person as required by OSHA in 29 CFR 1926, and (2) accredited and certified in accordance with the AHERA regulation 40 CFR Part 763, Subpart E, Appendix C; and (3) licensed in accordance with current State requirements.
- B. Project Manager: Provide a qualified and experienced project manager to perform administrative and project management responsibilities and to serve as Contractor management point of contact in addition to the project supervisor.
- C. Pre-Construction Conference: An initial progress meeting, recognized as "Pre-Construction Conference" will be convened by Owner with Contractor prior to the start of work for each phase. This meeting will be held to review the scope-of-work, scheduling, coordination, and contractor plan of action and submittals and other applicable items.
- D. Daily Log: Maintain at the work area a daily log documenting the dates and time of but not limited to, the following items:
1. Visitations; authorized and unauthorized
 2. Daily sign-in sheet for all personnel entering and leaving the work area (name, certification, expirations).
 3. Special or unusual events, i.e. barrier breaching, equipment failures, accidents
 4. Documentation of the following:
 - a) Supervisor's daily inspections and exposure monitoring test results
 - b) Work progress each day for each work area
 - c) Removal of waste material (number and type of containers) from each work area
 - d) Removal of waste from site including a copy of the accompanying waste shipment record
 - e) Decontamination of work area and equipment
 - f) Final inspection and air clearance results, and
 - g) Documentation of containment removal and final general housecleaning activity
 5. Complete and maintain daily log in accordance with applicable State and federal record keeping requirements. Provide access to logs to Owner and IH Consultant at all times and provide copies of logs with the submittal package in accordance with the construction submittal requirements.

1.10 STANDARDS

- A. Applicability of Standards: It is the Contractor's responsibility to complete all work in accordance with (or exceeding) all applicable industry standards and guidelines. Except where Contract Documents include more stringent requirements, all applicable construction industry standards

have the same force and effect as if bound or copied directly into Contract Documents. Applicable construction standards are made a part of the Contract Documents by reference. Where compliance with an industry standard is required, comply with the most current standards in effect as of date of Contract Documents.

- B. **Conflicting Requirements:** Where compliance with two or more standards is specified, and they establish different or conflicting requirements for minimum quantities or quality levels, the most stringent requirement will be enforced, unless the Contract Documents indicate otherwise. Refer to Owner and IH Consultant any requirements that are different or conflicting; outline the more stringent requirement before proceeding.
- C. Comply with applicable standards including, but not limited to, American National Standards Institute (ANSI) standards and American Society for Testing and Materials (ASTM) standards.

1.11 CODES, REGULATIONS, AND STANDARDS

- A. Adhere to work practices and procedures set forth in applicable codes, regulations and standards related to work. Obtain permits, licenses, inspections, and similar documentation, as well as payments and similar requirements associated with codes, regulations, and standards. Update permits as necessary.
- B. The Contractor shall assume full responsibility and liability for compliance with all applicable Federal, State, and local regulations pertaining to work practices, hauling, disposal, and protection of workers, visitors to the site, and persons occupying areas adjacent to the site. The Contractor is responsible for providing medical examinations and maintaining medical records of personnel as required by the applicable Federal, State, and local regulations. The Contractor shall hold Owner and IH Consultant harmless for failure to comply with any applicable work, hauling, disposal, safety, health or other regulation on the part of himself, his employees, or his subcontractors.
- C. All work performed under this contract shall comply with applicable provisions, including most current versions, and not limited to the listed and all other applicable local, state and federal codes and regulations.
- D. **Federal Requirements:** which govern asbestos abatement work or hauling and disposal of asbestos waste materials include but are not limited to the following:

OSHA: U.S. Department of Labor, Occupational Safety and Health Administration, including but not limited to:

1. Occupational Exposure to Asbestos, Tremolite, Anthophyllite, and Actinolite; Final Rules
2. 29 CFR 1910.1001 and 29 CFR Part 1926.1101
3. Respiratory Protection: Title 29, Part 1910, Section 134 of the CFR
4. Construction Industry: Title 29, Part 1926, of the CFR and all related Subparts
5. Access to Employee Exposure and Medical Records: 29 CFR, Part 1910, Section 2
6. Hazard Communication: Title 29, Part 1910, Section 1200 of the CFR
7. Specifications for Accident Prevention Signs and Tags: 29 CFR Part 1910, Sec. 145

DOT: U. S. Department of Transportation, including but not limited to:

1. Hazardous Material Regulations: Title 29, Part 171-180 CFR

EPA: U. S. Environmental Protection Agency (EPA), including but not limited to:

1. Asbestos Abatement Projects; Worker Protection Rule: Title 40 Part 763, Sub-part G
 2. Asbestos School Hazard Abatement Reauthorization Act (ASHARA)
 3. Asbestos Containing Materials in Schools Final Rule 40 CFR Part 763, Sub-part E
 4. National Emission Standard for Hazardous Air Pollutants (NESHAPS); National Emission Standard for Asbestos, 40 CFR Part 61, Sub-part A, and Sub-part M (Revised Sub-part B)
- E. Local Requirements: Abide by all local requirement that govern asbestos abatement work or hauling and disposal of asbestos waste materials.
- F. State of New Hampshire Requirements: which govern asbestos abatement work or hauling and disposal of asbestos waste materials include but are not limited to the following:
1. Asbestos Management and Control, N.H. Admn. Rules Ch. Env-A 1800
 2. Asbestos Management and Control, N.H. RSA Ch. 141-E
 3. Solid Waste Management Act, N.H. RSA Ch. 149-M and N.H.RSA Ch.147-A
 4. N.H. Admin. Rules Ch. Env-Sw 400-1200 and 2100-2800; and Env-Hw 100-300

1.12 DEFINITIONS

- A. General Definitions: Definitions contained in this Section are not necessarily complete, but are general to the extent that they are not defined more explicitly elsewhere in the Contract Documents.
1. Directed: Terms such as "directed", "requested", "authorized", "selected", "approved", "required", and "permitted" mean "directed by Owner's representative", "requested by the "IH Consultant", and similar phrases. However, no implied meaning shall be interpreted to extend the IH Consultant's responsibility into the Contractor's area of construction supervision.
 2. Approve: The term "approved," where used in conjunction with the Owner or the IH Consultant's action on the Contractor's submittals, applications, and requests, is limited to the responsibilities and duties of the IH Consultant as indicated in the Contract Documents. Such approval or acceptances do not express or claim any certification of completeness, compliance, or approval of programs and documentation, including but not limited to review of analytical results, historical information, and interpretations. Such approval shall not release the Contractor from responsibility to fulfill Contract Document requirements, unless otherwise provided in the Contract Documents.
 3. Furnish: The term "furnish" is used to mean "supply and deliver to the project site, ready for unloading, unpacking, assembly, installation, and similar operations."
 4. Install: The term "install" is used to describe operations at project site including the actual "unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning and similar operations."
 5. Provide: The term "provide" means "to furnish and install, complete and ready for the intended use."
 6. Installer: An "Installer" is an entity engaged by the Contractor, either as an employee, subcontractor or sub- subcontractor for performance of a particular construction activity, including installation, erection, application and similar operations. Installers are required to be

experienced in the operations they are engaged to perform.

7. **IH Consultant:** This is the entity employed or engaged as industrial hygiene consultant as described in the Contract Documents. All references to Owner's Consultant, Air Monitoring Consultant, or Consultant with regard to asbestos abatement in the Contract Documents in all cases refer to the IH Consultant. The IH Consultant will represent Owner during abatement and until final payment is due. The Owner representative may also constitute other persons representing Owner, other than the IH Consultant or consultant, as indicated by Owner. Owner's instructions to the Contractor will be made directly to the Contractor or forwarded through the IH Consultant.
8. **Site Supervisor:** This is the Contractor's Representative at the work site. This person will be the Competent Person required by OSHA in 29 CFR 1926 and licensed Site Supervisor/Foreman as required by the State. Provide licensed supervisor at each individual work site during work.

B. Definitions - Asbestos Abatement:

1. **Accredited or Accreditation (when referring to a person or laboratory):** A person or laboratory accredited in accordance with section 206 of Title II of the Toxic Substances Control Act (TSCA).
2. **Adequately Wet:** Means sufficiently mix or penetrate with liquid to prevent the release of particulate. If visible emissions are observed coming from the asbestos-containing material, then that material has not been adequately wetted. The absence of visible emissions is not sufficient evidence, or measure, of a material being adequately wet.
3. **Air Monitoring:** The process of measuring the fiber content of a specific volume of air.
4. **Amended Water:** Water to which a surfactant has been added to decrease the surface tension to 35 or less dynes.
5. **Asbestos:** The asbestiform varieties of serpentinite (chrysotile), riebeckite (crocidolite), cummingtonite-grunerite, anthophyllite, and actinolite-tremolite. For purposes of determining respiratory and worker protection both the asbestiform and non-asbestiform varieties of the above minerals and any of these materials that have been chemically treated and/or altered shall be considered as asbestos.
6. **Asbestos-Containing Material (ACM):** Any material containing more than 1% of asbestos of any type or mixture of types.
7. **Asbestos-Containing Building Material (ACBM):** Surfacing ACM, thermal system insulation ACM, or misc. ACM in or on interior structure or other parts of a building.
8. **Asbestos-Containing Waste Material:** Any material that is or is suspected of being or any material contaminated with an asbestos-containing material that is to be removed from a work area for disposal. May also be referred to as "asbestos waste".
9. **Asbestos debris:** Pieces of ACBM or ACM that can be identified by color, texture, or composition, or means dust, if the dust is determined by an accredited inspector to be ACM or reasonably likely to have asbestos fibers present under conditions present and based on work operations.

10. Authorized Visitor: Owner, the IH Consultant, testing lab personnel, emergency personnel or a representative of any federal, state and local regulatory or other agency having authority over the project.
11. Barrier: Any surface that seals off the work area to inhibit the movement of fibers.
12. Breathing Zone: A hemisphere forward of the shoulders with a radius of approximately 6 to 9 inches.
13. Category I Non-Friable ACM: means ACM packings, gaskets, resilient floor covering, and asphalt roofing products containing more than 1% asbestos. Also see definition for Regulated ACM.
14. Category II Non-Friable ACM: means any non-friable ACM, except for Category I Non-Friable ACM.
15. Certified Industrial Hygienist (CIH): An industrial hygienist certified in Comprehensive Practice by the American Board of Industrial Hygiene.
16. Critical Barrier: Polyethylene sheeting, typically 6-mil polyethylene sheeting, over windows, doors, and air passageways separating the work area from non work area portions of the building. Critical barriers remain in place until clearance testing or inspections are completed and results meet clearance test criteria.
17. Demolition: The wrecking or taking out of any building component, system, finish or assembly of a facility together with any related handling operations.
18. Disposal Bag: A properly labeled 6 mil thick leak-tight plastic bags used for transporting asbestos waste from work and to disposal site.
19. Contractor: The contractor engaged by Owner to perform asbestos related activities must be licensed by the State, as applicable, and in accordance with NH Admn. Rule Env-A 1800. All workers and site supervisors engaging in asbestos activity must also be trained and licensed in accordance with current State regulations and 40 CFR Part 763 (AHERA).
20. Encapsulant: A material that surrounds or embeds asbestos fibers in an adhesive matrix, to prevent release of fibers.
 - a. Bridging encapsulant: an encapsulant that forms a discrete layer on the surface of an in situ asbestos matrix.
 - b. Penetrating encapsulant: an encapsulant that is absorbed by the in situ asbestos matrix without leaving a discrete surface layer.
21. Encapsulation: Treatment of asbestos-containing materials, with an encapsulant and application of appropriate post removal encapsulant on substrate and containment barriers.
22. Enclosure: The construction of an air-tight, impermeable, permanent barrier around asbestos-containing material to control the release of asbestos fibers into the air.
23. Excursion Limit: Ensure that no employee is exposed to airborne concentrations of asbestos in

excess of 1.0 fibers per cubic centimeter of air (1.0 f/cc) as averaged over a sampling period of thirty (30) minutes, as determined by PCM analysis in accordance with NIOSH Method 7400 and as indicated in 29 CFR Part 1926. Also referred to as the short-term exposure limit, (STEL).

24. Friable Asbestos Material: Material that contains more than 1.0% asbestos and that can be crumbled, pulverized, or reduced to powder by hand pressure when dry. This also includes materials which, when subjected to removal methods and other disturbances, may release fibers and dust due to the abatement actions.
25. Glovebags: Glovebags for removal of insulation in accordance with 29 CFR Part 1926.
26. HEPA Filter: A High Efficiency Particulate Air (HEPA) filter capable of trapping and retaining 99.97% of asbestos fibers greater than 0.3 microns in diameter.
27. HEPA Filter Vacuum Collection Equipment (or vacuum cleaner): High efficiency particulate air filtered vacuum collection equipment with a filter system capable of collecting and retaining asbestos fibers. Filters should be of 99.97% efficiency for retaining fibers of 0.3 microns or larger.
28. Negative Pressure Respirator: A respirator in which the air pressure inside the respiratory-inlet covering is positive during exhalation in relation to the air pressure of the outside atmosphere and negative during inhalation in relation to the air pressure of the outside atmosphere.
29. Permissible exposure limit (PEL): the Contractor shall ensure that no employee is exposed to an airborne fiber concentration of asbestos in excess of 0.1 f/cc of air as an eight (8) hour time-weighted average (TWA) in accordance with 29 CFR Part 1926.
30. Personal Monitoring: Sampling of the asbestos fiber concentrations within the breathing zone of an employee.
31. Pressure Differential and Ventilation System: A local exhaust system, utilizing HEPA filtration capable of maintaining a pressure differential with the inside of the Work Area at a lower pressure than any adjacent area, and which cleans re-circulated air or generates a constant air flow from adjacent areas into the Work Area.
32. Regulated ACM (RACM): RACM means friable ACM, Category I Non-friable ACM that has been rendered friable, Category I ACM that will be or has been subjected to sanding, cutting, grinding, or abrading (abrasive action), or Category II Non-friable ACM that has a high probability of becoming, or has become, crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of renovation or demolition operations. Grinding means breaking into small pieces or fragments.
33. Repair: Returning damaged ACBM or ACM to an undamaged condition or to an intact state so as to prevent fiber release.
34. Respirator: A device designed to protect the wearer from the inhalation of harmful atmospheres.
35. Time Weighted Average (TWA): The average concentration of a contaminant in air during a specific time period.
36. Visible Emissions: Any emissions, coming from RACM, ACM, ACBM, asbestos debris or

asbestos waste material, which is visually detectable without the aid of instruments. This does not include condensed uncombined water vapor.

37. Waste Shipment Record: Means the shipping document, required to be originated and signed by the waste generator, used to track and substantiate the disposition of Asbestos waste.
38. Wet Cleaning: The process of eliminating asbestos contamination from building surfaces and objects by using clothes, mops, or other cleaning utensils which have been dampened with amended water and afterwards thoroughly decontaminated or disposed of as asbestos-contaminated waste.
39. Work Area: The area where asbestos-related work or removal operations are performed which is defined and/or isolated to prevent the spread of asbestos dust, fibers or debris, and entry by unauthorized personnel. Work area is a Regulated Area as defined by 29 CFR 1926.

1.13 NOTICES

- A. U.S. Environmental Protection Agency: Send proper written notification as required by USEPA National Emission Standards for Hazardous Air Pollutants (NESHAPS) Asbestos Regulations (40 CFR 61, Subpart M) to the regional Asbestos NESHAPS Contact - Reno/Demo Clerk - at least 10 working days prior to beginning any work which will directly or indirectly result in disturbance of asbestos-containing materials. Post notifications at job site.
- B. State and Local Agencies: Send written notification as required by state and local regulations prior to beginning any work on asbestos-containing materials. At least 10 working days prior to the start of work, submit appropriate notification to the New Hampshire Department of Environmental Services, Air Resources Division. Post notifications at job site.
- C. Permits: Obtain all local, state and federal permits necessary to conduct the work of this specification. Obtain water permits as necessary for release of any water originating from the Work. Notify all local emergency agencies of the abatement work to be completed as required. All asbestos containing waste is to be transported by an entity maintaining a current "DOT Common Hauler Permit" specifically for asbestos-containing materials, as required for transporting of waste asbestos-containing materials to a disposal site.
- D. Licenses: Maintain current licenses as required by applicable state and local jurisdictions for the removal, transporting, disposal or other regulated activity relative to the work of this contract. Post all company, supervisor, and worker licenses at work area entrance.
- E. Posting and Filing of Regulations: Post all notices required by applicable federal, state and local regulations. Maintain at least one (1) copy of applicable federal, state and local regulations and standards at each job site. Post copies of the specification at the job site.
- F. Coordinate with Owner and local fire department authorities the notification and handling of heat and smoke detectors in the work areas, including sealing of detectors during work and removal of seals at the completion of work or shifts.

1.14 SUBMITTAL REQUIREMENTS

- A. Submittal Schedule: Submittals will be provided by the Contractor as specified herein including (1) Preconstruction Submittal Documentation prior to start of work and (2) Project Closeout

Submittals within 25 days upon completion of on-site work. Submit ongoing submittals as required herein and as specified by the Owner and IH Consultant. Provide at the job site a copy of all current submittal packages and related documentation. Ongoing submittals will also be submitted during the work as required to update the Pre-construction and Closeout submittals including, but not limited to:

1. Schedule or phasing changes, including description and explanations as applicable.
2. Proposed alternative work methods. Requests for revisions in work procedures must be approved by the Owner and IH Consultant.
3. Updated notifications and permitting.
4. Changes to licenses and training records for all personnel at the site
5. Other changes or revisions to the submittals.

B. Submittal Preparation

1. Package and furnish to Owner and IH Consultant each submittal appropriately. Submittal packages shall be in a neat and orderly fashion, will include an index, and shall be compiled in the order requested herein. Clearly mark and label all sections of the submittal documents.
2. In the event that a submittal package does not meet the requirements herein the submittal may not be accepted and the Contractor will make necessary revisions and re-submit the submittal documents.
3. By “approval” or acceptance of submittals, Owner and IH Consultant do not express or claim any certification of completeness, compliance, or approval of programs and documentation, not limited to review of analytical results, historical information, regulatory compliance, and interpretations. Contractor is solely responsible for compliance with Specification and regulatory requirements associated with the work and submittal documentation.

C. Preconstruction Submittal Documentation

1. Provide the following Preconstruction Submittal Documentation prior to the start of each phase of work:
 - a) Notifications: Copies of EPA, State, and local notifications.
 - b) Waste Hauler and Landfill Permits and notifications. Submit names, address, and licenses/permits for the waste hauler(s) and disposal facilities.
 - c) Names, addresses, experience, and references for any subcontractors the Contractor proposes to utilize for Work. Indicate if any asbestos workers or supervisors to be used for Work are subcontracted labor.
 - d) Names and 24-hour phone numbers/pagers for Project Supervisor and other key personnel for the Contractor. Post emergency contact information at Decontamination Unit entrance.
 - e) List of personnel to be on-site. Copies of all company, supervisor, and worker licenses, training

and certifications required in accordance with this Specification.

- f) Notarized Certifications: Submit notarized certification signed by an officer of the Contract stating that exposure measurements, respiratory protection programs, medical surveillance, worker training, and recordkeeping has and will be completed and maintained during the Work for all involved personnel in accordance with 29 CFR Part 1926 and other applicable State and federal regulations.
- g) Certify the dates for primary and secondary HEPA filter changes for all negative air units.
- h) Level of respiratory protection anticipated for each operation required by the project. Include supporting documentation of previous exposure monitoring on a sufficient number similar project and operations in accordance with OSHA requirements.
- i) Detailed schedule and phasing, containment layouts, and summary of approach; detail of any special work procedures or methods to be used if not included or addressed in the abatement specification.
- j) Safety Data Sheets: for all materials to be used on-site not limited to encapsulants, spray adhesives, and other related work material. Note: It is Contractor's responsibility to notify all other contractors and parties in accordance with applicable OSHA hazard communication regulations.
- k) Contingency Plan: Prepare a site-specific contingency plan for emergencies including fire, accident, power failure, pressure differential system failure, supplied air system failure, or any other event that may require modification or abridgement of decontamination or work area isolation procedures. Include in plan specific procedures for decontamination or work area isolation. Note that nothing in this specification should impede safe exiting or providing of adequate medical attention in the event of an emergency. The emergency contingency plan must be in accordance (meet or exceed the requirements of) with applicable OSHA requirements.
- l) Other submittals required by the Contract Documents or as indicated by Owner.

D. Closeout Submittals

- 1. The following Closeout Submittals will be provided upon substantial completion of Work - each phase and prior to final completion of each phase of work.
 - a) Copies of all daily logs in accordance with Section 1.9 Project Coordination of this specification;.
 - b) A copy of each waste shipment record, hazardous waste manifest, and chain-of-custody form, signed by the transporter and disposal facility operator, indicating that waste was packaged and disposed of properly. Include a description of any temporary storage facilities used including, dates, times, and locations of temporary storage. Note: In accordance with NESHAPS, submit all waste shipment documentation within 35 days from transport of waste from the site (provide interim submittals during the work as needed to comply with federal regulations). Note: copies of waste shipment records in progress shall also be provided to IH Consultant and Owner immediately upon removal of waste from site.

- c) Complete copy of all revisions and changes to the Pre-Construction Submittals.
- d) Copy of other written construction documents such as Change Orders and work modifications issued in printed form during construction. Mark these documents and a site drawing to show the work completed and to show substantial variations in actual work performed in comparison with the text of the Specifications and modifications.

1.15 AIR MONITORING

- A. Ambient Area Air Monitoring: IH Consultant will/may monitor ambient area airborne fiber counts in and around the Work Area. The purpose of this air monitoring will be to detect airborne asbestos concentrations that may challenge the ability of the Work Area isolation procedures to protect the balance of the building or outside of the building from contamination by airborne fibers and to monitor concentrations outside the containment or work area perimeter.
- B. Clearance Air Monitoring: Refer to Work Area Clearance section of this specification.
- C. Stop Action Levels
 - 1. Inside Work Area: Maintain an average airborne count in the Work Area of less than 0.10 fibers per cubic centimeter. If the fiber counts rise above this figure for any sample taken, revise work procedures and engineering controls to lower fiber counts.
 - 2. Outside Work Area: If any air sample taken outside of the Work Area exceeds 0.01 f/cc, immediately and automatically stop all work except corrective action necessary to address elevated concentrations. If it is determined by Owner or IH Consultant that the elevated concentration was the result of a failure of Work Area isolation measures or Contractor work methods, initiate the following actions:
 - a) Erect additional critical barriers to isolate the affected area
 - b) Install HEPA filtration negative air units in affected area
 - c) Decontaminate the affected area in accordance with appropriate cleaning procedures.
 - d) Require that respiratory protection and personal protective equipment is used in affected area until area is cleared for re-occupancy in accordance with the work area clearance requirements.
 - 3. Effect on Contract Sum: Complete corrective work with no change in the Contract Price or Sum if high airborne fiber counts were caused by Contractor activities.
- D. Analytical Methods: Owner reserves the right to use either phase contrast microscopy (PCM) and/or transmission electron microscopy (TEM) to analyze air samples. PCM analysis will be performed using the NIOSH 7400 method at the job site or at an off-site laboratory. TEM may also be used as Owner deems necessary for ambient area air samples using the analysis method as determined by IH Consultant. Also see Work Area Clearance section.
- E. Schedule of Air Samples
 - 1. Prior to the start of work: The IH Consultant will collect air samples to establish a base line before start of work. Base line is an action level expressed in fibers per cubic centimeter that is twenty-five percent greater than the largest of the following:

- a) Average of the PCM samples collected outside each Work Area
 - b) Average of the PCM samples collected outside the building
 - c) And 0.01 f/cc
2. Daily: From start of work involving Temporary Enclosures through the work of Project Decontamination, IH Consultant will be collecting samples during the Work, including but not necessarily limited to:
- a) At HEPA Exhaust areas
 - b) Non work-area portions of the building
 - c) At entrance to the Decontamination Unit
 - d) Outside the building
 - e) Clearance sampling: See the Air Clearance Requirements.

F. Laboratory Testing:

1. The services of a testing laboratory will be employed by Owner to perform laboratory analyses of the air samples. Samples will be sent overnight on a daily basis, so that verbal reports on air samples can be obtained within 24 hours. Results of all air monitoring tests will be available at the job site on a daily basis.

G. OSHA Monitoring and Additional Testing:

1. Additional Testing: The Contractor may conduct his own air monitoring and laboratory testing. If he elects to do this the cost of such air monitoring and laboratory testing shall be at no additional cost to Owner.
2. OSHA Compliance and Ambient Area Monitoring: Contractor must provide for collection and laboratory analysis services of Contractor's OSHA personal exposure samples, including daily TWA and STEL monitoring for asbestos and other contaminants resulting from the Work, including but not limited to carbon monoxide, volatile organic compounds, and chemical exposures.

1.16 TEMPORARY FACILITIES

- A. General: Provide temporary connection to existing building utilities or provide temporary facilities as required to complete work. Owner must approve all connections to utilities and facility components. Provide temporary portable water and power sources for all exterior work as indicated and coordinated with Owner, as applicable.

B. Water Service:

1. Temporary Water Service Connection: Provide hot and cold water to the Work Area. Provide a qualified and experienced licensed plumber as necessary to complete all water service work in conformance with applicable building codes and regulations.
2. All connections to the Owner's water system shall include back-flow protection. Monitor for leaks and repair or replace as needed.
3. Water Hoses: Employ suitable heavy-duty abrasion-resistant hoses to provide water into each work area and to each Decontamination Unit.

C. Electrical Service:

1. General: Provide a qualified and experienced licensed electrician to complete all electrical service work. Comply with applicable OSHA, NEMA, NECA, UL and other industry standards and governing regulations for materials and layout of temporary electric service. Provide adequate temporary power to the Work Area sized and equipped to accommodate all electrical equipment required for completion of the work and related testing and inspections. Provide temporary electrical panel as needed sized and equipped to accommodate all electrical equipment and lighting required by the work. Connect temporary panel to existing building electrical system. Protect with circuit breaker or fused disconnect. Locate temporary panel outside of the work area and in a location acceptable to Owner. Equip all circuits for any purpose entering Work Area with ground fault circuit interrupters (GFCI).
2. Lamps and Light Fixtures: Provide appropriate temporary work area lighting. Protect lamps with guard cages or tempered glass enclosures where fixtures are exposed to breakage by construction operations.

D. First Aid: Comply with governing regulations and recognized recommendations within the construction industry. Provide appropriate first aid supplies.

E. Fire Extinguishers: Provide appropriate fire extinguishers for temporary offices, storage, work areas and other portions of the site occupied or used by Contractor for the work.

F. Execution: Use 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. Coordinate all such work with Owner. Require that tradesmen be licensed as required by local authorities. Relocate, modify and extend services and facilities as required during the course of work so as to accommodate the entire work of the project.

1.17 PRESSURE DIFFERENTIAL AND AIR CIRCULATION SYSTEM

- A. Continuously monitor and record the pressure differential between the Work Area and the building outside of the Work Area. Maintain accurate records of time and locations of testing on-site and in daily logs.
- B. HEPA Filtered Fan Units: Supply the required number of HEPA filtered fan units to the site in accordance with these specifications. Units must meet the requirements of all applicable regulations and standards.

1.18 WORKER PROTECTION

A. Comply with respiratory protection requirements as specified in this specification and applicable regulations. Provide worker protection as required by the most stringent OSHA and/or EPA regulations and industry standards applicable to the work. The following procedures are minimum requirements to be adhered to regardless of fiber concentrations in the Work Area.

B. Worker Training

1. AHERA Accreditation: All workers are to be accredited as Abatement Workers as required by

the AHERA regulation 40 CFR 763 Appendix C to Subpart E, April 30, 1987. All training must be current including current annual refresher training.

2. Train all supervisors and workers in accordance with EPA NESHAPs and 29 CFR Part 1926 (OSHA) for asbestos and other hazards anticipated during the work. All workers and supervisors must be licensed and certified as required by applicable State regulations.
- C. Medical Examinations: Provide medical examinations for all workers who will enter the Work Area for any reason in accordance with OSHA requirements as set forth in 29 CFR 1926 and 29 CFR 1910.20.
- D. Protective Clothing
1. Coveralls: Provide cloth full-body coveralls and hats, and require that they be worn by all workers in the Work Area. Require that workers change out of coverall in the Equipment Room of the Personnel Decontamination Unit. Dispose of used coverall as asbestos waste.
 2. Other: Provide other personal protective equipment as required by OSHA regulations and industry standards, not limited to: hard hats, eye protection (goggles), gloves, fall safety, and footwear.
- E. Entering Work Area: Each time Work Area is entered, remove all street clothes in the changing (clean) room of the personnel decontamination unit and put on new disposable coverall, new head cover, and a clean respirator. Proceed through shower room to equipment room and put on work boots. Only properly licensed/certified personnel shall enter the decontamination unit and work area. All personnel entering the work area must post their State license at the decontamination unit entrance.
- F. Decontamination Procedures: Require all workers to adhere to the following personal decontamination procedures whenever they leave the Work Area:
1. HEPA vacuum all gross debris from the protective clothing prior to entering the equipment room of the decontamination unit. When exiting area, remove disposable coveralls, disposable head covers, and disposable footwear covers or boots in the equipment room.
 2. Still wearing respirators, proceed to showers. Showering is mandatory. Care must be taken to follow reasonable procedures in removing the respirator to avoid asbestos fibers while showering. The following procedure is required as a minimum:
 3. Carefully wash face piece of respirator inside and out. Each worker leaving the work area must shower completely with soap and water. Rinse thoroughly. Proceed from shower to clean room and change into street clothes or into new disposable work items.
- G. Within Work Area: Require that workers NOT eat, drink, smoke, chew tobacco or gum, or apply cosmetics in the Work Area. Maintain proper use of personnel protective equipment.
- H. Respiratory Protection: Provide sufficient respiratory protection in accordance with applicable OSHA requirements in addition to ANSI and NIOSH standards. Select proper level of protection based on personnel exposure monitoring and the applicable OSHA Permissible Exposure Limits. Require that respiratory protection be used at all times that there is any possibility of disturbance of asbestos-containing materials whether intentional or accidental.

1. Instruct and train each worker for proper respirator use in accordance with OSHA and other applicable industry standards. Require that a respirator be worn by anyone in a Work Area at all times, regardless of activity, until the area has been cleared for re-occupancy.
 2. Provide and complete all necessary fit testing for respiratory protection in strict accordance with applicable OSHA regulations.
 3. In the event that applicable OSHA PEL's (8-hour TWA and 30-minute STEL) are exceeded, stop work. Do not recommence work until work procedures, including use of engineering controls, are modified to maintain exposures within the acceptable PEL's.
- I. Complete all lock-out and tag-out of power and air handling systems within the Work Area in accordance with OSHA regulations. Coordinate all lock-out and tag-out with Owner.

1.19 TEMPORARY ENCLOSURES

- A. Work areas are to be considered contaminated during the work and shall be completely isolated from other locations such that asbestos fibers cannot pass through or beyond the perimeters of the work area and into non work areas. Should areas beyond the work area become contaminated with asbestos as a result of the Contractor's work, the Contractor shall be responsible for cleaning non-work areas as required. All costs including cleaning, decontaminating, monitoring and testing shall be borne by the contractor.
- B. Contractor shall construct temporary containment enclosures in each work area. Prior to proceeding with ACM abatement coordinate and complete inspections of the work area with the IH Consultant. Proceed with work sequentially as listed or indicated.
- C. Disable ventilating systems or any other system bringing air into or out of the Work Area. Disable system by disconnecting wires, removing circuit breakers, by lockable switch or other positive means that will prevent accidental premature restarting of equipment as approved by Owner.

PART 2 - PRODUCTS

2.1 PRODUCTS

- A. Provide new or used materials and equipment that are undamaged and in serviceable condition. Provide only materials and equipment that are recognized as being suitable for the intended use and in strict compliance with appropriate standards. Do not bring products, materials, and equipment to the Owner's site or Owner work areas that are damaged or contain construction or potential contaminated debris.
- B. Warning Signs, Caution Signs and Demarcation: Provide all demarcation, warning signs, caution signs, and other postings required for the work and in accordance with State and federal codes and regulations.
- C. Polyethylene Sheet: A single polyethylene film in the largest sheet size possible to minimize seams, in 6.0 mil thickness, clear or black as indicated.
- D. Duct Tape: Provide duct tape in 3" widths with an adhesive, which is formulated to stick aggressively to sheet polyethylene.

- E. Spray Cement: Provide spray adhesive in aerosol cans which is specifically formulated to stick tenaciously to sheet polyethylene.
- F. Foam Pack: Provide foam pack for sealing small crevices and cracks at critical barriers as required. All foam pack must be approved by Owner and local authorities, not limited to the Fire Department.
- G. Scaffolding: Provide all scaffolding, ladders and/or staging, etc. as necessary to accomplish the work of this contract. Scaffolding may be of suspension type or standing type such as metal tube and coupler, tubular welded frame, pole or outrigger type or cantilever type. The type, erection and use of all scaffolding shall comply with all applicable OSHA provisions. Equip rungs of all metal ladders, etc. with an abrasive non-slip surface. Provide a nonskid surface on all scaffold surfaces subject to foot traffic.
- H. First Aid Supplies: Comply with governing regulations and recognized recommendations within the construction industry.
- I. Fire Extinguishers: Provide Type "A" fire extinguishers for temporary offices and similar spaces where there is minimal danger of electrical or grease-oil-flammable liquid fires. In other locations provide type "ABC" dry chemical extinguishers, or a combination of several extinguishers of NFPA recommended types for the exposures in each case.
- J. Wetting Materials: For wetting prior to disturbance of ACM use amended water: Provide water to which a surfactant has been added. Use a mixture of surfactant and water which results in wetting of the Asbestos-Containing Material 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.
- K. Encapsulant: Provide suitable encapsulant material intended by manufacturer for the treatment of asbestos and ACM. Provide SDS and manufacture information for products to be used. Ensure that all encapsulant to be applied is suitable for the substrate and condition thereof and is compatible with replacement materials to be installed by Contractor or Owner following the Work.
- L. Disposal Bags: Provide 6 mil thick leak-tight polyethylene bags labeled as required by applicable sections of this Specification and federal and state regulations.
- M. Fiberboard Drums of Equivalent: Provide sufficient quantity of fiberboard drums or equivalent (as determined by IH Consultant) for packaging of wire mesh and other contaminated materials with sharp or rough edges.
- N. Disposal Bag/Container Labels and Signs: Provide leak-tight waste bags or containers for disposal of asbestos-containing materials with labels in accordance with OSHA, EPA, and the latest revisions to the US Department of Transportation requirements, not limited to material identification number (#NA2212), material packaging group (PGIII), and labels. Warning labels will also include:

Legend:

DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE HAZARD

1. In accordance with NESHAPS, label each waste bag with the name of the waste generator and

address where the material was generated. Include the Contractor name and address on each label also. Attach label in a sufficient manner such that they are properly sealed to or on the containers.

2. Label all waste bags, containers, and transport vehicles as required by applicable U.S. Department of Transportation Rules and Regulations.
- O. Coveralls: Provide disposable full-body coveralls and head covers in accordance with State and federal regulations. Provide a sufficient number for all required changes, for all workers in the Work Area. Provide sufficient number for use by IH Consultant.
- P. Other PPE: Provide other personal protective equipment as required by OSHA regulations and industry standards, not limited to: hard hats, eye protectives, gloves, and footwear.
- Q. Respiratory Protection: Provide respiratory protection in strict accordance with ANSI Z88.2 - 1992 "Practices for Respiratory Protection" and 29 CFR 1926 and 1910.134. The respirators will be sanitized and maintained in accordance with manufacturer's specifications and recommendations. Provide sufficient respiratory protection based on applicable ANSI and NIOSH standards. Select proper level of protection based on personnel exposure monitoring and the applicable OSHA Permissible Exposure Limits. Use only respirators and filter that are NIOSH-approved for use with asbestos and other atmospheres anticipated during the work.
- R. Solvents: Provide appropriate solvent materials to aid in the removal of flooring materials and mastics. Such solvent materials should be "low-odor" rated and all SDS's shall be submitted to the Owner for review prior to storing or using such materials at the job site. Contractor is solely responsible for all environmental and worker protection precautions required for the safe use, clean-up, and disposal of such materials. Additional air testing (area and personal exposure monitoring) must be completed by the Contractor (at no additional cost to the Owner) depending on the solvents to be used and as necessary to ensure a safe environment for site workers and adjacent public. Coordinate with Owner as necessary to assure compatibility with replacement materials prior to installation of solvents and coordinate special cleaning efforts with Owner for replacement issues in accordance with manufacturer's guidelines and flooring industry standards. Contractor shall sufficiently wash and clean all floor areas where solvent is used. Conduct necessary wash, dry, and air change sequences to eliminate residual solvent odors and residual. Note: Charcoal pre-filters will be required on all HEPA exhaust/filter equipment during use of solvents.
- S. Construction Materials: Provide other construction materials such as plywood, strapping, studs, other related abatement materials, etc., as required to complete the work in accordance with this Specification.
- T. All necessary testing and monitoring equipment as applicable to complete work, including but not limited to gas detection equipment, manometers, exposure sampling equipment.

2.2 WATER SERVICE

- A. Provide water service as necessary to complete Work in accordance with applicable local, state, and federal building codes and regulations.

2.3 ELECTRICAL SERVICE

- A. Provide electric service as necessary to complete Work in accordance with applicable local, state,

and federal building codes and regulations.

2.4 PRESSURE DIFFERENTIAL AND FILTRATION

- A. General: Supply the required number of HEPA filtered negative air fan units to the site in accordance with this Specification, industry standards, and applicable State and federal requirements. Use fan units that are intended for asbestos abatement as stated by the manufacturer. Provide HEPA filters that are 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 or equivalent when tested in accordance with Military Standard Number 282 and Army Instruction Manual 136-300-175A. Provide filters that bear a UL586 label to indicate ability to perform under specified conditions.
- B. Pre-filters: 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.
- C. Provide appropriate charcoal pre-filters during all work involving use of solvents to minimize odors. Allow HEPA units to run for a sufficient period of time after use of solvents to allow for adequate number of air changes and filtration to adequately dilute odors.
- D. Safety and Warning Devices: Provide units with the appropriate safety and warning devices including but not limited to missing or failure of HEPA filter, automatic shut down in the event of filter rupture or blockage, operating status indicator lights, and audible alarms.

2.6 AUXILIARY GENERATOR

- A. Provide adequate, suitable alternative power with a capacity adequate to power a minimum of 50% of the HEPA filtered fan units in operation at any time during the work as needed for emergency use and backup.

PART 3 – EXECUTION

3.1 TEMPORARY ENCLOSURES

- A. Control Access: Isolate the Work Area to prevent entry by building occupants and the public into Work Area. Notify the Owner of all doors and other openings that must be secured to isolate Work Area. Maintain safety access to stairwells and building exits. Construct work area containments and isolation barriers as required allowing for Owner operations and as approved by Owner.
 - 1. Secured Access: Arrange Work Area so that the only access into Work Area is through securable doors to personnel and equipment decontamination units.
 - 2. Provide Warning Signs at each door and barrier leading to Work Area reading as follows:

Legend:

DANGER
KEEP OUT
BEYOND THIS POINT
CONSTRUCTION WORK
IN PROGRESS

- 3. Immediately inside door (leading to Work Area) and outside all accessible critical barriers post

D. Pre-Clean and Other Preparation Work Area:

1. Complete the following after installation of (1) critical barriers, (2) pressure differential/air filtration systems, and (3) decontamination facilities as indicated below and in other Specification Sections.
 - a) Pre-clean all work area surfaces, fixtures, and equipment using HEPA vacuums and wet wiping.
 - b) Seal non-removable fixtures and equipment with polyethylene sheeting. Provide a minimum of 12" of overlap, sealed with spray adhesive and duct tape on both flap ends, on all joints in the barriers. Do not damage materials and items to be covered.
2. Provide and install transparent inspection windows in the containment barriers as indicated by the IH Consultant. Maintain inspection window clean of debris to allow for inspection of work in progress.
3. Complete other preparation work as necessary to allow for complete precleaning and allow for installation of containment barriers.

E. Primary Barrier:

1. Do not install primary barriers until all work area surfaces have been pre-cleaned using wet cleaning and HEPA vacuuming.
 2. Protect building and other surfaces in the Work Area from damage from water and high humidity or from contamination from asbestos-containing debris, slurry or high airborne fiber levels by covering with a primary barrier as described below. Coordinate with Owner to prevent adequate ventilation to space and equipment that requires air ventilation.
 3. Primary Barrier Sheet Plastic: Protect floor surfaces with a minimum of 2 layers of 6-mil plastic sheeting on floors. Provide additional floor protection as required to prevent damage to carpets and other existing flooring surfaces to remain after construction. Protect all existing fixed equipment and other building surfaces with a minimum of 1 layer of 6-mil plastic sheeting in addition to critical barrier systems.
 - a) For work areas with abatement limited to nonfriable flooring only, provide a minimum of 48" (extending up from the floor) polyethylene sheeting barrier as a splash-guard.
 - b) In all cases provide additional barriers and covering as needed to protect building surfaces from damage during the work.
 4. Protect all existing building surfaces and fixed equipment/items, also including non-ACM insulations in the work areas, with a minimum of 2 layers of 6-mil plastic sheet as required to maintain existing conditions and to prevent contamination, water damage, or other damages due to the work. Provide a minimum of 12" of overlap, sealed with spray adhesive and duct tape on both flap ends, on all joints in the barriers.
- F. Seal all ducts and equipment with primary barriers. Isolate and shut down air systems in work area during abatement. Isolate all exterior intakes sufficiently from HEPA exhaust points. Ventilation units and ductwork shall be fully sealed with polyethylene sheeting.

G. Stop Work: If the Critical or Primary Barrier fails or is breached in any manner stop work immediately and repair the breach as required. Do not start work until authorized by the IH Consultant. Any contamination and/or suspect contamination, as determined by Owner and the IH Consultant, resulting from a breach in the barriers or other neglect by the Contractor shall be thoroughly abated in accordance with this Specification at no additional cost to Owner.

H. Decontamination Units

1. Provide personnel and equipment decontamination facilities in accordance with State and OSHA regulations and require that the personnel decontamination unit be the only means of ingress and egress for the Work Area (for personnel, waste, equipment and other related items). Provide portable shower units, with continuous dedicated water source, sufficient for personnel decontamination in accordance with State and OSHA regulations, and 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 primary filter and output of primary filter passes through secondary filter and final filter.
 - a) Primary Filter - Passes particles 20 microns and smaller
 - b) Secondary Filter - Passes particles 10 microns and smaller
 - c) Final Filter - Passes particles 5 micron and smaller
2. Do not discharge filtered water unless testing and permitting has been completed as applicable in accordance with State and local requirements.
3. Clean debris and residue from inside of Decontamination Units on an ongoing basis.
4. Post an asbestos warning sign at the entrance of the decontamination unit.
5. Adequately secure door to entrance of decontamination unit at the completion or each shift.

I. Containment Locations

1. Construct and install containment barriers around each work area as coordinated and indicated by Owner and IH Consultant. Do not allow containment location and installation to inhibit access and adequate airflow to all other areas of the building and mechanical equipment. Coordinate with Owner the isolation of mechanical equipment in the work area.

3.3 REMOVAL OF ASBESTOS-CONTAINING MATERIALS

- A. Inspections: Prior to commencing with ACM removal or other ACM disturbance, each individual work area must pass an inspection by the IH Consultant. If deficiencies are observed, immediate correct in a manner satisfactory to IH Consultant.
- B. Maintain all work area isolation and controls during work of this section. The Contractor shall conduct ongoing inspections of the work area, adjacent areas and surrounding areas beneath, as applicable, for containment breaches, leaks or other containment failures. In the event breeches or potential breeches are identified, immediately repair the containment barriers as needed and complete all clean up and decontamination work.

C. Secondary Barrier: Over any floors and surfaces beneath ACM to be removed in the work areas, install as a drop cloth a clear 6-mil sheet plastic in all areas where asbestos removal work is to be carried out. Completely cover floor with sheet plastic. Install Secondary Barrier at the beginning of each work shift. Install only sufficient plastic for work of that shift. Remove Secondary Barrier at end of each work shift or as work in an area is completed. Carefully pack in disposal bags

D. Wet Removal and Waste Packaging - General:

1. Thoroughly wet ACM to be removed or otherwise disturbed prior to disturbance, stripping and/or tooling to reduce fiber dispersal into the air. Maintain materials as adequately wetted during Work and as required by NESHAPS. Accomplish wetting by a fine spray (mist) of amended water. Saturate material sufficiently to wet to the substrate without causing excess dripping. Allow time for amended water to penetrate material and seams thoroughly. Spray material repeatedly during the work process to maintain a continuously wet condition.
2. Where necessary, carefully remove ACM while simultaneously spraying amended water to minimize dispersal of asbestos fibers into the air. Mist work area continuously with amended water whenever necessary to reduce airborne fiber levels. Do not allow ACM to dry out. As it is removed, simultaneously pack material into appropriate asbestos waste disposal bags/containers. For waste bags, twist neck of waste bags, bend over and seal with minimum three wraps of duct tape. Clean outside of packaging and move packaged waste to the equipment decontamination unit for further cleaning and waste re-packaging. Once in equipment decontamination unit and cleaned, repackage waste in 2nd waste bag and seal as indicated above.
3. Continuously clean excess water using wet wiping and HEPA vacuuming such that excess water build up on the floor and other containment surfaces does not occur and so that water does not leak or migrate outside of the work area.
4. Use work procedures that result in 8-hour TWA and STEL airborne fiber counts less than the required limits established by OSHA and as described herein. If airborne fiber counts exceed this level immediately mist the area with amended water to lower fiber counts and revise work practices and engineering controls to maintain level within the required limits.

E. Other Safety: As applicable, comply with all appropriate safety procedures during Work in accordance with industry standards and all applicable OSHA regulations including but not limited to: confined space work safety procedures in accordance with 29CFR Part 1910.146; proper personal protective equipment; worker safety training and written programs per current OSHA requirements; fall protection; lockout tag out; and take precautions to avoid burns and heat stress when working in areas of hot equipment and excessive heat as applicable.

F. Floor Tile and Mastics:

1. Remove cove base material in areas of flooring abatement and carpet removal (cove base mastic to remain). Heating units in the work areas will remain (remove floor tile and mastic flush to heating unit edges). Do not damage or stain heating units. The ACM will be removed by hand scrapers and will not be allowed to dry out during removal and packaging. Do not render the materials friable and use care not to break ACM into small fragments during removal. Friable removal requires full containment barriers on all wall, floor, and ceiling surfaces. Mechanical or bead blasting methods are prohibited unless specifically approved in writing by Owner and Owner's IH Consultant. As removed, the ACM will be simultaneously packed while still wet into corrugated boxes or burlap bags and then sealed shut. The boxes/bags will then be sealed

and placed into proper disposal bags. The necks of the disposal bags will be twisted, bent over and sealed with minimum three wraps of duct tape. Caution will be used to protect the bags and wrapping from tears and rips due to sharp edges.

2. Coordinate with Owner as necessary to assure compatibility with replacement materials prior to installation of solvents and coordinate special cleaning efforts with Owner for replacement issues in accordance with manufacturer's guidelines and flooring industry standards. Mastic on concrete shall be removed using a suitable solvent and manual scraping/brushing, wet wiping, and HEPA vacuums. Do not use solvents on any wood or other porous substrates. Do not allow solvent to leak out of the work area or seep into floor or wall cracks, and take precautions to prevent solvent from entering cracks and/or crevices in the concrete and wall/floor joints. All waste will be packaged into appropriate waste containers. Residue on the floor will be removed with stiff-bristle-nylon hand brush. This work will be repeated until all visible debris has been removed from substrate. In areas with solvent use, as requested by the Owner, leave adequate air filtration and pressure differential systems in continuous operation for at least 24 hours after the air clearance criteria has been met to allow for ventilation of odors.
3. As applicable and possible, provide adequate inspection of the building spaces below areas of floor removal to detect, prevent and correct damage from liquids that escape the work area. Adequately wash all floor substrates and other building surfaces following abatement and clearance testing using an appropriate cleaner and water as needed to clean residual film and minimize residual odor. Do not damage remaining finishes and substrates and do not use excessive water. Package waste as asbestos waste.

3.4 INITIAL CLEAN-UP WORK

- A. Once gross removal is completed, clean all visible debris on the substrate and containment barriers using HEPA vacuums, scrub brushes, and wet-wiping. Do not allow materials to dry out. As material is removed and clean-up is completed, simultaneously pack wetted material into proper waste disposal bags or package as noted above. For waste bags, twist the neck of the bags, bend the neck over, and seal with a minimum of three wraps of duct tape. Clean the outside of the bags with wet wiping and HEPA vacuum and move to the wash down station in the Equipment Decontamination Unit. Once washed clean, place the clean disposal bags into a second asbestos disposal bag and seal the bag in the same manner as the first. Bags will then be transported from the work area to the asbestos waste dumpster. Note: Waste dumpster must remain labeled and locked at all times when loading is complete or idle.
- B. Label waste dumpsters in accordance with 29 CFR 1910.145: Legend

DANGER
ASBESTOS DUST HAZARD
CANCER & LUNG DISEASE HAZARD
AUTHORIZED PERSONNEL ONLY

- C. Change all filters on the pressure differential systems and properly dispose of as asbestos waste. Maintain adequate filtration and pressure differential during all filter changes.

3.5 PROJECT DECONTAMINATION

- A. Work of This Section includes the decontamination of air and surfaces in the Work Area which has

been, or may have been, contaminated by the elevated airborne asbestos fiber levels generated during abatement activities, or which may previously have had elevated fiber levels due to ACM in the space.

1. First Cleaning

- a) Carry out a first cleaning of all surfaces of the work area including items of remaining sheeting, tools, scaffolding and/or staging by use of damp- or wet-cleaning and mopping, and HEPA vacuuming. Do not perform dry dusting or dry sweeping. Use each surface of a cleaning cloth one time only and then dispose of as contaminated waste. Continue this cleaning until there is no visible debris from the substrate and other work area surfaces.
- b) At the completion of the above cleaning Contractor Supervisor shall visually inspect all work area surfaces. Re-clean if any dust, debris, etc. is found. Inspect the area and if any debris or dust is found, repeat the cleaning. Continue this process until no debris dust or other material is found while sweeping of all surfaces with forced air equipment (important: forced air sweeping to be used only in full containment work areas).
- c) Remove and replace all negative air unit pre-filters, dispose of used filters as asbestos waste.

2. Second and Third Cleaning

- a) At the completion of the first cleaning and Contractor inspection, carry out a second cleaning of all surfaces in the work area in the same manner as the first cleaning. For containments with multiple layers of polyethylene sheeting on floors, remove top layers of sheeting on the floor leaving one layer of the primary barrier remaining. Clean newly exposed areas as outlined above and dispose of removed sheeting as asbestos waste.
- b) Carry out a third cleaning of all surfaces in the same manner as the first cleaning. Change filters on pressure differential systems and properly dispose of as asbestos waste. Allow for sufficient settling period prior to clearance testing. Complete additional cleaning as required and until no visible dust or debris is present.

B. Visual Inspection: After completion of above cleaning and Contractor's own visual inspection, The IH Consultant shall perform a visual inspection for debris from any sources, residue on surfaces, dust or other matter in the Work Area to confirm the Contractor's inspection findings.

1. For full containment work areas, during visual inspection sweep entire work area including walls, ceilings, ledges, floors, and other surfaces in the room with exhaust from forced air equipment (leaf blower with approximately 1 horsepower electric motor or equivalent).
2. IH Consultant Visual inspection is complete when the area is visually clean, and no debris, residue, dust or other material is found. If any debris, residue, dust or other matter is found repeat Contractor cleaning and the IH Consultant Visual Inspection.
3. Encapsulation of substrate: After successful final visual inspection, perform encapsulation of substrate as approved by Owner using suitable encapsulant material. Coordinate with Owner to ensure compatibility with replacement materials and fire retardant ratings for the surfaces to be encapsulated. Do not allow overspray to damage other surfaces, materials and equipment in the work area and do not allow overspray and build up or pooling of encapsulant.

- C. Clearance Testing: Air clearance sampling will be conducted by the IH Consultant. See Work Area Clearance section. Air clearance testing will not be completed until the work area passes visual inspection, has had adequate air changes, and sufficient time for surfaces to adequately dry.
- D. Removal of Work Area Isolation: Complete only after the work area clearance sections have been met and verified by the IH Consultant. Remove all Primary Barrier sheeting and equipment decontamination unit(s), leaving only: critical barriers, personnel decontamination unit, and operational pressure differential/air filtration systems. Properly dispose of sheeting as asbestos-waste. Use care to prevent damage to building surfaces and materials during teardown. All damages to surfaces and materials shall be repaired by Contractor unless otherwise noted and agreed to in writing by Owner.
 - 1. Re-inspect all work area surfaces and adjacent areas for any dust and debris that may have originated from the work. Clean all surfaces using HEPA-vacuums and wet-wiping as required and until all surfaces are clean of visible debris. Shut down and remove the Pressure Differential System. Seal HEPA filtered fan units, HEPA vacuums and similar equipment with 6 mil polyethylene sheet and duct tape to form a tight seal at intake end before being moved from Work Area.
 - 2. Remove personnel decontamination unit. Remove the critical barriers and properly dispose of as asbestos-waste. Clean all surfaces using HEPA-vacuums and wet-wiping as required and until all surfaces are clean of visible debris.
- E. Final Cleaning: This cleaning is now being applied to existing room conditions. Take care to avoid watermarks or other damages. Wet-wipe and HEPA vacuum surfaces in the work area until clean and free from dust and debris. Complete final cleaning in accordance with the project close-out requirements. Accompanied by Owner, Contractor Site Supervisor shall complete a final post-abatement inspection of all surfaces and re-clean and conduct repairs as necessary.

3.6 WORK AREA CLEARANCE

- A. Contractor Release Criteria: The Work Area shall be considered cleared when the Work Area meets the final visual inspection criteria described in the project decontamination section and airborne fiber structure concentrations have been reduced to the level specified below and pursuant to applicable State and federal asbestos regulations. Contractor must provide at least 48 hours advance notice to the IH Consultant for any clearance testing or other inspections required.
- B. Clearance Air Monitoring: Air clearance samples will be collected by the IH Consultant. In full containment areas air clearance sampling will be conducted using aggressive sampling techniques in accordance with state and federal regulations.
- C. Analytical Method: The number and volume of air samples taken and analytical methods used by the IH Consultant based on conditions of work and the various State and federal requirements. Phase Contrast Microscopy (PCM) and Transmission Electron Microscopy (TEM) may be used for analysis of clearance samples collected to confirm completion of abatement of ACM in accordance with applicable State and federal regulations. Other analytical methods may also be used as determined by IH Consultant based on conditions of the work and other factors.
- D. PCM Air Clearance Testing: Decontamination of Work Areas requiring PCM air clearance testing only is complete when every Work Area clearance sample collected has total fiber concentrations below the 0.010 f/cc. If any sample does not meet the clearance criteria, the decontamination is

incomplete and Contractor shall repeat final cleaning. The Contractor shall be responsible for all costs for each subsequent and additional round of testing and analysis required until the clearance criteria is met.

- E. TEM Air Clearance Testing: For work areas requiring TEM analysis, air clearance testing will be completed in the work area after completion of all cleaning work in accordance with 40 CFR Part 763 and other applicable industry standards and guidelines.
 - 1. TEM Release Criteria: Decontamination of the work site is complete if either of the following condition is met if the average concentration of asbestos on the five or more inside Work Area Clearance samples does not exceed the filter background level of 70 structures per square millimeter of filter area.
 - 2. If these conditions are not met then the decontamination is incomplete and the Contractor shall repeat final cleaning procedures. The Contractor shall be responsible for all costs for each subsequent and additional round of TEM analysis required until the clearance criteria is met.

3.7 DISPOSAL OF ASBESTOS-CONTAINING WASTE MATERIAL

- A. General: Asbestos-containing waste materials and debris which is packaged in accordance with the provisions of this Specification may be disposed of at designated sanitary landfills when certain precautions are taken not limited to: notice to appropriate EPA Regional Offices and notice and permit from appropriate State and local agencies are completed. Waste disposal site(s) must be properly licensed, permitted, and qualified to accept and handle Asbestos waste in accordance with all applicable local, State, and federal codes and regulations.
- B. Disposal: Comply with the following sections during all phases of this work: worker protection requirements and respiratory protection requirements. All waste is to be hauled by a waste hauler with all required licenses and permits from all state and local authority with jurisdiction.
 - 1. Carefully load all containerized asbestos-containing waste material on sealed and lined trucks or other appropriate vehicles for transport. Exercise care before and during transport, to insure that no unauthorized persons have access to the materials.
 - 2. All ACM and asbestos materials removed are to be properly containerized in one of the following: (1) Two 6 mil disposal bags, or (2) Two 6 mil disposal bags and a fiberboard drum, or (3) equivalent method as approved by Owner and State. Do not store disposal bagged material outside of the work area. Take bags or drums from the work area directly to a sealed truck or dumpster. Glove bags shall not be used as waste disposal bags.
 - 3. Owner will provide a designated location for placement of proper waste dumpster. Line waste dumpster with a minimum of 2 layers of 6 mil polyethylene sheeting and such that a minimum total of 20 mils of lining exists (including waste bags). Waste dumpster(s) will not be allowed to remain at the job site for longer than 72 hours upon completion of each phase (work area) of work by the Contractor. Do not transport disposal bagged materials on open trucks. During loading and unloading, properly demarcate and label dumpster on all 4 sides. Dumpster shall be sealed, labeled and locked during all non-loading periods.
 - 4. In accordance with NESHAPs and State regulations, advise the landfill operator or processor in advance of transport, of the quantity of material to be delivered. At a disposal site, sealed plastic bags may be carefully unloaded from the truck. If bags are broken or damaged, leave in truck

and clean entire truck and contents using procedures set forth herein. Retain receipts from landfill or processor for materials disposed of. At completion of hauling and disposal of each load submit copy of waste manifest, chain of custody form, and landfill receipt to Owner and IH Consultant.

5. Provide copy of waste shipment record (complete to date) to Owner and IH Consultant prior to removing waste from the site. Provide final copy of completed waste shipment record to Owner and IH Consultant within 25 days of removing waste from the site.

3.8 RESTORATION AND REPLACEMENT

- A. Conduct restoration and replacement work in accordance with the Contract Documents and provide certification that all materials used in the construction, restoration, renovation, and other work are asbestos-free. Repair all damaged surfaces, tape damage, adhesive, and other damages resulting from the work or other damages caused by the Contractor as indicated by Owner, to meet or exceed existing conditions, and as otherwise stated in the Contract Documents. Conduct additional house cleaning and floor cleanings as necessary.

3.9 ASBESTOS PROJECT CLOSEOUT

- A. Contractor shall achieve Substantial Completion and then Final Completion as indicated below prior to requesting final payment.
- B. General cleaning during and after construction is required as needed to maintain general housekeeping and as otherwise required herein. Complete all final, general house-keeping and cleaning in the work areas in accordance with 29 CFR Part 1910 and 29 CFR Part 1926, as applicable. Remove temporary protection and facilities installed for protection or security of the work during construction. Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Owner's property. Do not discharge volatile, harmful or dangerous materials into drainage systems. Remove waste materials from the site and dispose of in a lawful manner. Where extra materials of value remaining after completion of associated Work have become the Owner's property, arrange for disposition of these materials as directed.
- C. Conduct all other related work, non-asbestos work, and general construction activity in accordance with the Contract Documents and Owner's written request.
- D. Substantial Completion consists of the following: (1) all work area abatement, decontamination and related site work is complete; (2) interim submittal requirements are submitted; (3) final visual inspection and air clearance requirements have been met in each work area; (4) removal of containment barriers and Contractor equipment is complete; (5) all general cleaning has been performed as indicated herein; (6) other work tasks and administrative requirements have been completed in accordance with the contract documents and specification; and (7) post-abatement site inspection and review with Owner has been performed.
- E. Final Completion consists of the following: (1) Substantial Completion met; (2) completion of all Closeout Submittal requirements; and (3) complete, to Owner's satisfaction, any remaining punch-list items identified during the post-abatement site inspection with Owner.

END