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**APPLICABILITY FOR
Design and Engineering Design Standards Documents**

Project teams shall refer to their executed project contracts for applicable document versions/revisions.

SECTION 02 85 33

REMOVAL AND DISPOSAL OF HAZARDOUS BUILDING MATERIALS

NOTE TO DESIGNER:

SECTION 02 85 33 SHOULD ALWAYS BE USED WITH SECTION 01 35 43 HAZARDOUS AND CONTAMINATED SUBSTANCE HEALTH AND SAFETY PROGRAM.

EACH PROJECT TEAM WILL CHOOSE IF THE CONTRACTOR OR SOUND TRANSIT IS RESPONSIBLE FOR RETAINING THE HAZARDOUS BUILDING MATERIAL (HBM) SME. THE HBM SME IS A 3RD PARTY RESPONSIBLE FOR QUALITY ASSURANCE AND QUALITY CONTROL THAT ABATEMENT WAS SUFFICIENTLY COMPLETED. EACH PROJECT TEAM WILL CHOOSE WHETHER THE CONTRACTOR OR SOUND TRANSIT IS RESPONSIBLE FOR RETAINING THE CONTAMINATED SUBSTANCE SME. THE HBM SME HAS THE FOLLOWING RESPONSIBILITIES:

- FULL-TIME OBSERVATION DURING ABATEMENT WITH DAILY FIELD REPORTS.
- DEVELOPMENT OF A CLOSEOUT REPORT.
- VISUAL INSPECTION FOLLOWING ABATEMENT TO CONFIRM MATERIAL WAS ABATED SATISFACTORILY.

THIS SPECIFICATION COVERS BOTH APPROACHES AS "OPTION 1" AND "OPTION 2". THE SPECIFICATION NEEDS TO BE MODIFIED FOR THE PROJECT. "OPTION" TEXT IS ITALICIZED. NON ITALICIZED TEXT SHOULD BE MAINTAINED IN ALL SPECIFICATIONS. THE OPTIONS INCLUDE:

- **OPTION 1** TEXT TO BE USED WHEN SOUND TRANSIT IS RESPONSIBLE FOR RETAINING THE HBM SME UNDER A SEPARATE CONTRACT TYPICALLY AS PART OF THE CONSTRUCTION MANAGEMENT TEAM OR UNDER THE ENVIRONMENTAL DUE DILIGENCE ON-CALL. THE CONSTRUCTION CONTRACTOR IS RESPONSIBLE FOR RETAINING THE ABATEMENT CONTRACTOR WHICH INCLUDES PLAN DEVELOPMENT, ABATEMENT, AND POST ABATEMENT CLEARANCE. OPTION 1 IS TYPICALLY USED ON DESIGN BID BUILD AND GC/CM PROJECTS, BUT CAN BE USED ON DESIGN BUILD PROJECTS.
- **OPTION 2** TEXT TO BE USED WHEN THE CONTRACTOR IS RESPONSIBLE FOR RETAINING THE HBM SME AND ALSO TO PERFORM THE CONTRACTOR-RESPONSIBLE ITEMS OF OPTION 1. IN THESE CIRCUMSTANCES SOUND TRANSIT WILL STILL RETAIN A HBM SME FOR REVIEW OF SUBMITTALS. OPTION 2 IS TYPICALLY USED ON DESIGN BUILD PROJECTS AND CAN BE USED ON GCCM PROJECTS. OPTION 2 IS TYPICALLY NOT USED ON DESIGN BID PROJECT PROJECTS.

DESIGNER TO DELETE TEXT ABOVE FOR FINAL SECTION

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes:

1. Requirements for removal, handling, transportation, and disposal of hazardous building materials (HBM) from structures scheduled for demolition. Section applies to each Contractor and subcontractor performing Hazardous Building Material activities.

1.02 REFERENCES

A. This Section incorporates by reference the latest revision of the following documents:

1. International Building Code (IBC).
2. Code of Federal Regulations (CFR):
 - a. 29 CFR 1910 Occupational Safety and Health Standards.
 - b. 29 CFR 1926 OSHA Construction Standards.
 - c. 40 CFR 61 National Emission Standards for Hazardous Air Pollutants Subpart M–Asbestos.
 - d. 40 CFR 260 Hazardous Waste Management Systems: General.
 - e. 40 CFR 261 Identification and Listing of Hazardous Waste.
 - f. 40 CFR 262 Standards Applicable to Generators of Hazardous Waste.
 - g. 40 CFR 263 Standards Applicable to Transporters of Hazardous Waste.
 - h. 40 CFR 264 Standards for Owners and Operators of Hazardous Waste Treatment, Disposal and Storage Facilities.
 - i. 40 CFR 265 Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities.
 - j. 40 CFR 268 Land Disposal Restrictions.
 - k. 40 CFR 273 Standards for Universal Waste Management.
 - l. 40 CFR 700 to 799 Toxic Substances Control Act (TSCA).
3. Washington Administrative Code (WAC):
 - a. WAC 296-24 General Safety and Health Standards.
 - b. WAC 296-62 General Occupational Health Standards:
 - 1) WAC 296-62-077 Asbestos, Tremolite, Anthophyllite, and Actinolite.
 - 2) WAC 296-62-07521 Lead.
 - c. WAC 296-65 Asbestos Removal and Encapsulation.
 - d. WAC 296-155 Safety Standards for Construction.
 - e. WAC 173-303 Dangerous Waste Regulations.
 - f. WAC 296-901 Globally Harmonized Hazardous Communication.
4. National Institute for Occupational Safety and Health (NIOSH).
5. Washington Department of Labor and Industries.
6. Revised Code of Washington (RCW):
 - a. RCW 49.17 Washington Industrial Safety and Health Act (WISHA).
7. Puget Sound Clean Air Agency Regulation III, Article 4, Asbestos Control Standards.

B. Definitions:

1. The following definitions are contained in the Contract Documents:
 - a. Certified Industrial Hygienist (CIH).
 - b. Hazardous Building Material (HBM).
 - c. Hazardous or Contaminated Substance.
 - d. Hazardous or Contaminated Substance Health and Safety Plan (HCS-HASP).
 - e. Site Safety Health Officer (SSHO).
 - f. Unknown Hazardous or Contaminated Substance Screening and Handling Plan (UHCS-SHP).
2. Abatement: Procedures to control fiber release from asbestos containing building materials. Includes encapsulation, enclosure, and removal.
3. Asbestos Abatement: Any demolition, renovation, repair, construction, or maintenance activity of any public or private facility that involves the repair, enclosure, encapsulation, removal, salvage, handling, or disposal of any material with potential for releasing asbestos fibers from asbestos containing material into the air.
4. Airlock: A system for permitting restricted ingress or egress while allowing air movement from an uncontaminated area to a contaminated area during negative air pressure conditions in the work area, typically including two curtained doorways at least 6 feet apart.
5. Air Monitoring: Sampling of asbestos fiber concentrations within the asbestos removal area which is representative of the airborne concentrations of asbestos fibers which may reach the breathing zone.
6. Ambient Air: The air outside buildings and structures.
7. Amended Water: Water containing a wetting agent or surfactant.
8. Asbestos: The term asbestos includes chrysotile, amosite, crocidolite, tremolite, anthophyllite, and actinolite.
9. Asbestos Containing Material (ACM). Asbestos or material containing asbestos in excess of one (1) percent by weight.
10. Asbestos Containing Material (ACM) Waste: Asbestos containing or contaminated materials or objects requiring disposal.
11. Asbestos Fibers: This expression refers to asbestos fibers having an aspect ratio of three to one and longer than 5 micrometers.
12. Asbestos Removal Contractor: The asbestos abatement firm contracted to perform the asbestos abatement services addressed in these Specifications.
13. Asbestos Supervisor: A person who has been trained and certified in accordance with a state-approved EPA Asbestos Training Center.

14. Authorized Visitor: Sound Transit personnel, Resident Engineer, or a representative of any of the regulatory agencies having jurisdiction over the project.
15. Bridging Encapsulant: A liquid material that can be applied to ACM that controls the possible release of asbestos fibers from the material by creating a membrane over the surface. Also referred to as a sealant when used to seal residual fibers left on a surface from which asbestos has been removed.
16. Breathing Zone: An area within a hemisphere, forward of the shoulders, with a radius of 6- to 9-inches and the center at the nose or mouth of an employee.
17. Certified Asbestos Workers: Workers who have received training through an accredited training center in accordance with regulations as set forth in 40 CFR Part 763 and as required by WAC 296-62 in accordance with the requirement of WAC 296-65.
18. Clean Room: An uncontaminated area or room, which is part of the decontamination enclosure system, with provisions for storage of workers' street clothes and protective equipment.
19. Clearance Air Sample: The air monitoring sample taken after all abatement is completed and prior to deregulation of work areas. Provide clearance air samples equal to or better than the ambient air at the (less than 0.01 fiber/cubic centimeter).
20. Containment: An enclosure with restricted access where the air is filtered.
21. Curtained Doorway: A device to allow ingress or egress from one (1) room to another while permitting minimal air movement between the rooms, typically constructed by placing three overlapping sheets of plastic over an existing or temporarily framed doorway, securing each along the top of the doorway, securing the vertical edge of one (1) sheet along one (1) side of the doorway, and securing the vertical edge of the other sheets along the opposite vertical side of the doorway.
22. Decontamination Enclosure System: A decontamination enclosure system for workers, materials and equipment, including a designated area of the work area adjacent and connected to the regulated area including an Equipment Room, shower room, and clean room formed by connecting a series of rooms with curtained doorways forming airlocks between any two (2) adjacent rooms.
23. Demolition: The wrecking or removing of any load-supporting structural member and any related removing or stripping of Friable Asbestos Materials.
24. Encapsulant: A material which is applied to ACM to minimize or eliminate potential release of asbestos fibers, either by creating a membrane over the surface (bridging encapsulant) or by penetrating into the material and binding the components together (penetrating encapsulant).
25. Equipment Room: A contaminated area or room, which is part of the decontamination enclosure system, with provisions for storage of contaminated clothing and equipment.
26. Excursion Limit: The maximum personal exposure concentration of asbestos fibers for any 30-minute period (1.0 fiber per cubic centimeter of air (f/cc)).
27. Friable Asbestos Material: Material that contains more than one (1) percent asbestos by weight and that can be crumbled, pulverized, or reduced to power by hand pressure when dry.

28. Glove Bag: A customized bag for covering friable ACM with gloves to allow work inside the bag.
29. HBM SME: Hazardous Building Materials Subject Matter Expert is a 3rd party responsible for quality assurance and quality control that abatement was sufficiently completed. HBM SME is also responsible for sampling unknown HBM when encountered during abatement.
30. HEPA-Filtered Equipment: High-efficiency particulate air-filtered equipment with a filter capable of collecting and retaining particulates (asbestos fibers, lead dust, PCB dust, etc.).
31. Mercury-containing Components: All instruments, control devices, tools, heating or cooling system components that contain liquid mercury, typically, but not always, enclosed in a glass tube or other glass structure.
32. Mini-Enclosure: An abatement method that establishes an isolation zone as a sub-area of the total area. Air exchanges requirements are a minimum of four (4) per hour. Decontamination facilities include two (2) air chamber airlock, double suiting and HEPA-filtered vacuuming.
33. Negative Air System: A localized and HEPA-filtered exhaust system capable of maintaining a constant, low velocity air flow into the Decontamination Enclosure Systems and Work Area from adjacent uncontaminated and unsealed areas.
34. Non-Friable Asbestos Material: Material that contains asbestos in which the fibers have been locked in by a bonding agent, coating, binder, or other material so that the asbestos is well bound and will not release fibers in excess of the asbestos control limit during any appropriate use, handling, demolition, storage, transportation, processing, or disposal.
35. PCB-Containing Material: Material containing PCBs including but not limited to PCB article, PCB article container, PCB container, PCB capacitor, PCB-equipment, PCB item, PCB transformer, and/or PCB waste as defined in 40 CFR 761.
36. Removal: All herein specified procedures necessary to strip HBMs from the designated areas and to dispose of these materials in a permitted facility.
37. Shower Room: A room between the clean room and the equipment room in the worker decontamination enclosure system, with hot and cold or warm running water and suitably arranged for complete showering during decontamination. The shower room comprises an airlock between contaminated and clean areas.
38. Stripping: Removing Friable Asbestos Materials from any pipe, duct, boiler, tank, turbine, furnace, or structural member from any building, structure, facility, or installation.
39. Structural Member: Any load-supporting member, such as beams and load-supporting walls, or any non-load-supporting member, such as ceilings and non-load-supporting walls.
40. Surfactant: A chemical wetting agent added to water to improve penetration, thus reducing the quantity of water required for a given operation or area.
41. Suspect ACM: Material encountered during removal work that is suspected of being ACM, based on proximity to other ACM, or other indicators.

42. TSCA: Toxic Substances Control Act –Law that regulates chemicals not regulated by other U.S. Is the main federal statute concerned with regulation of the manufacture, distribution, use, and disposal of PCB-containing materials.
43. TSD: treatment, storage or disposal facility: A facility or landfill that treats, stores or disposes of Dangerous Waste as defined in WAC 173-303 and RCRA.
44. Waste Manifest: Form used by haulers of ACM waste, solid and dangerous waste that lists type and quantity of waste, the generator it originated from, the transporter that shipped it, and the treatment, storage, or disposal facility to which it is being shipped.
45. Wet Cleaning: The process of eliminating asbestos contamination from building surfaces and objects by using cloths, mops, or other cleaning tools which have been dampened with amended water, and by afterwards disposing of these cleaning tools as asbestos-contaminated waste. Use of HEPA-filtered vacuums are recommended during wet cleaning.
46. Work Area: The area where asbestos-related work or removal operations are performed that is defined and/or isolated to prevent the spread of asbestos dust, fibers, or debris, and entry by unauthorized personnel.

1.03 COORDINATION

A. Meetings:

1. The Contractor, at a minimum, must conduct the following meetings:
 - a. A preconstruction meeting with Sound Transit is required before abatement on each structure can begin. Attendance at these meetings is mandatory for the abatement contractor and HBM SME.
 - b. Meeting(s) with Sound Transit if suspect HBM is discovered during abatement and/or demolition.
 - c. Meeting(s) with Sound Transit if air clearance test fails to develop a course of action.

1.04 SUBMITTALS

A. Submit:

1. Asbestos, Lead, PCB, Mercury Management Work Plan. These plans can be separate plans or combined as one: 3 weeks prior to starting abatement.
2. Closeout documents (30 days following abatement activities at each project parcel).
3. *[Option 2]: Daily reports during abatement submitted within 5 working days. Daily field reports must be completed by the HBM SME.*
4. *[Option 2]: Closeout report within 4 weeks of completion of abatement at each project parcel. Resident Engineer may approve a single closeout report for the entire project. The HBM closeout reports should be completed by the HBM SME.*
5. *[Option 2]: Estimated quantity of additional suspect ACM to Resident Engineer within two days of receiving lab results.*

- B. Transmit:
1. Qualifications: 21 days after Notice to Proceed.
 2. Certificates: 21 days after Notice to Proceed.
 3. Clearance forms for each building: 1 day prior to demolition.
 4. Asbestos Agency Notifications and Permits: 3 days prior to abatement.
 5. Air sample results: 1 day following receipt of results.

1.05 QUALITY ASSURANCE

- A. Comply with local, state, and federal regulatory requirements and guidance documents included in Article 1.02, herein.
- B. Qualifications:
1. CIH and SSHO: In accordance with Contract Documents, Hazardous or Contaminated Substance Health and Safety Program.
 2. Asbestos work must be completed by a licensed asbestos removal contractor with the following minimum experience:
 - a. Satisfactory completion of at least three asbestos abatement projects of similar scope.
 - b. Licensed in the state of Washington.
 3. Contractor personnel performing the work must have the following experience:
 - a. One (1) year experience in the task they are to perform.
 - b. Asbestos:
 - 1) Asbestos Supervisor: Certified Full-Scale Asbestos Abatement Supervisor.
 - 2) Personnel working with ACM must have three (3) years or more experience in asbestos abatement.
 - c. Lead:
 - 1) Lead Supervisor: Three (3) years or more experience in lead management practices and eight hours training in lead management.
 - 2) Personnel working with lead (Pb) must have a minimum of two (2) hours lead awareness training.
 - d. PCB/Mercury:
 - 1) PCB/mercury Supervisor: 40-hour hazardous waste operations training.
 - 1) Personnel working with PCB and/or mercury-containing ballasts have hazard communication training in accordance with WAC 296-901. The PCB supervisor must be 40-hour hazardous waste operations trained.

4. Employees entering the Exclusion Zone for Hazardous or Contaminated Substances must have HAZWOPER training and certification. For Level D and above personal protective equipment (PPE) protection:
 - a. Completed appropriate safety training in compliance with 29 CFR 1910.120, 29 CFR 1910.134, and WAC 296-843-100.
 - b. Minimum of 40 hours health and safety training.
 - c. Minimum 24 hours of “on the job” training.
 - d. Eight (8) hours annual refresher training.
 - e. Respirator training and medical monitoring (as required for respirator use).
 5. *[Option 2] HBM SME: HBM SME is to be a first-tier subcontractor to the Contractor and must not be retained by the abatement or demolition contractor. HBM SME must have the following qualifications:*
 - a. *AHERA Building Inspector and Project Designer accreditation.*
 - b. *EPA Lead-Based Paint Inspector or Risk Assessor.*
 - c. *Respiratory training with current quantitative and qualitative fit testing.*
 - d. *Minimum of 10-years’ documented experience consulting and managing HBM abatement projects including:*
 - 1) *Abatement regulations.*
 - 2) *Sampling techniques and Chain of Custody documentation.*
 - 3) *Contractor’s Air Monitoring data reports.*
 - 4) *Assembly of daily reports with recommendations.*
 - 5) *Assembly of close out reports.*
- C. Certification:
1. Personnel working with asbestos-containing material must be certified asbestos workers.
 2. The asbestos supervisor must be certified for Full-Scale Asbestos Abatement.
 3. All personnel must have respirator fit test certification (qualitative/quantitative) for the respirators they intend to use.
 4. Disposal sites certification for proper disposal or treatment of Hazardous or Contaminated Substances.
 5. The transporter is a state-licensed transporter of Hazardous or Contaminated Substances.
 6. *[Option 2] Contractor’s HBM SME must be accredited as an AHERA Building Inspector and Project Designer and have lead-based paint accreditation as an inspector or risk assessor.*
- D. *[Option 1] The Contractor must provide access to Resident Engineer to complete visual inspection and verification of abatement completion for each work area and/or site/building.*

[Option 2] The Contractor's HBM SME must conduct daily full-time visual inspection during abatement and complete verification of abatement for each work area and/or site/building and document the work is complete and the site/building ready for demolition or safe for re-occupancy.

- E. Laboratory: In accordance with Contract Documents, Hazardous or Contaminated Substance Health and Safety Program.
- F. Comply with the following hold points:
 1. Contractor must modify plans included in this specification when project information changes throughout the duration of the project. Contractor must notify Resident Engineer when changes or modifications are made. Additional review and approval of such modifications will require transmittal or resubmittal as directed by the Resident Engineer.
 2. A clean copy of all plans and modified plan provided to Resident Engineer at least 5 days before work described in the plan can proceed.
 3. Clearance form transmitted prior to demolition.

1.06 PROJECT CONDITIONS

- A. HBM are anticipated to be encountered during the Work. These conditions will require the abatement, transportation and disposal of HBM.
- B. HBM that will be encountered is included in the Contract Documents.
- C. Existing utilities may be used if of adequate capacity. The power and water distribution systems in any existing buildings may not be suitable for use. Any work the Contractor finds necessary for power distribution and water distribution must be at the Contractor's expense.

1.07 ASBESTOS, LEAD, PCB AND MERCURY MANAGEMENT WORK PLAN

- A. Present the methods to be used for removing, staging, package, transport and dispose of ACM-, Lead-, PCB- and Mercury-containing materials and components.
- B. Include a detailed plan of the work procedures to be used in the removal of materials containing asbestos in compliance with all applicable Federal, State, and local regulations. Coordinate Air Monitoring, PPE, training and respiratory protection with Contract Documents including CIH approval and oversight of air monitoring. Do not begin work until the complete submittal package has been reviewed and accepted by the Resident Engineer.
- C. As a minimum, include the following components in the plan:
 1. Subcontractor qualifications, experience, and license number.
 2. Work procedures and sequences.
 3. Schedule of activities.
 4. Required Permits and Notifications.
 5. Exposure monitoring plan, include person responsible for Air Monitoring program.
 6. Respiratory Protection Program.
 7. Personal Protective Equipment.

8. Personnel Decontamination Procedures.
9. Personal Hygiene Practices, including wash station.
10. Administrative Controls.
11. Emergency/Spill Recovery Plan.
12. Housekeeping Practices.
13. Engineering Controls/Equipment.
14. Medical Surveillance Program.
15. Heat and/or Cold Stress Monitoring and Management.
16. Employee Training Certificates and Medical Surveillance.
17. Certifications and qualifications of the asbestos supervisor/competent person (if ACMs are present).
18. Independent Testing Laboratory Qualification Information.
19. Plans for disposing and/or recycling of lead-containing items, coatings, and debris (if lead-containing items are present).
20. Plans for disposing of PCB-containing materials (solid and liquid) (if PCB-containing items are present).
21. Plans for packaging and disposing of mercury-containing components (if mercury-containing components are present).
22. Signage.
23. Laboratory qualification information.
24. Plans for disposing of ACMs.
25. Decontamination of Equipment and Areas.
26. Manufacturers literature on equipment and materials.
27. Material safety data sheets for any chemicals.
28. Record Keeping.
29. Disposal facility information.
30. Transporter Information.
31. Respirator fit test records.
32. Job Hazard Analysis and Hazard Communication (including any Material Safety Data Sheets).

PART 2 - PRODUCTS

2.01 PRODUCTS

- A. Select respirators from those approved by the Mine Safety and Health Administration (MSHA), or by the National Institute for Occupational Safety and Health (NIOSH). Provide personnel engaged in the removal and demolition of asbestos from Negative Air System enclosures and visitors with Type C supplied air respirators, continuous flow or pressure-demand, operated with either an auxiliary positive pressure self-contained apparatus or HEPA filter.
- B. Equip Negative Air System machines with HEPA filters. Utilize pressure differential equipment continuously from first disturbance of ACM until completion of successful final inspection. Do not discharge unfiltered air outside the work area via air movement system or air filtering equipment. Maintain the exchange rate at no less than four air changes per hour. Continuously monitor and record the pressure differential across isolated barriers using a pressure differential monitoring device. Maintain the pressure differential at a minimum of -0.02-inches water column.
- C. A continuous-read strip chart manometer to measure and record pressure.
- D. Design air compressor to provide air volumes and pressure in accordance with respirator requirements. Compressors must meet the requirements of 29 CFR 1910 and be equipped with an in-line carbon monoxide monitor. Provide the compressed air system with a receiver of adequate capacity to allow the escape of personnel in case of compressor failure.
- E. Provide miscellaneous equipment, such as scaffolds, in accordance with task requirements.
- F. HEPA-filtered vacuums:
 - 1. Equip with disposable collection bags for the project.
 - 2. Equip with filters that are 99.97 percent efficient for retaining fibers of 0.3 micron or larger.
- G. Respirator Protection
 - 1. Provide the necessary respiratory protection for the work to be performed. Dress in respiratory protection equipment and level of protection in accordance with applicable regulations and standards.
 - 2. Type C respiratory protection is required for abatement activities inside a Negative Air System enclosure. This includes continuous flow, supplied air system with HEPA-filtered escape respirator.
 - 3. Half-face respirators may be used for abatement of Non-Friable ACM and Glove Bag procedure where a negative exposure assessment has been completed. The air monitoring results may be used to justify upgrades or downgrades of the respiratory protection. The Site Safety and Health Officer (SSHO) may propose changes to the Resident Engineer for evaluation. Downgrades of respiratory protection will only be allowed after approval by the Resident Engineer. Disposable half-face respirators may not be used.
 - 4. Properly maintain, clean, and store the respirators.

5. Provide respiratory protection for authorized visitors wishing to enter a Negative Air System enclosure, as needed. These include, but are not limited to, inspectors from the regulatory agencies and Sound Transit monitors.

2.02 MATERIALS

- A. Provide disposal drums that are metal or fiberboard with locking ring tops; labeled in accordance with EPA regulation 40 CFR 61.
- B. Provide disposal bags 6 mil in thickness.
- C. Provide and post warning signs as required by WAC 296-62.
- D. Construct walls separating abatement work area from other areas of fire-retardant wood or metal framing to support products barriers in all openings larger than 4-feet by 8-feet. For wood framing adhere to International Building Code. Cover the framing with 5/8-inch, type "X" gypsum wall board.
- E. Tape:
 1. Capable of sealing joints of adjacent sheets of plastic sheet and for attachment of plastic sheet to finished or unfinished surfaces of dissimilar materials.
 2. Capable of adhering under dry or wet conditions, including use of amended water.
 3. Minimum 2-inch wide.
- F. For surfactant (Wetting Agent) use ENVIRO-WET, ASBESTO-WET, NANCOL or equivalent approved by the Resident Engineer including 50 percent polyethylene ether and 50 percent polyethylene or polyglycol ether and mix with water in accordance with manufacturer's directions.
- G. Use encapsulation materials that are non-flammable, non-hazardous (non-solvent or petroleum based) penetrating type.
- H. Use non-hazardous solvent mastic remover capable of effectively removing mastic or other adhesive.
- I. Danger Signs and Labels: Provide danger signs and labeled barricades at all approaches to asbestos work areas. Locate signs at such a distance that personnel may read the sign and take the necessary protective steps required before entering the area. Provide and affix labels to all asbestos materials, scrap, waste, debris, and other products contaminated with asbestos.
 1. Danger Sign: Vertical format conforming to 29 CFR 1910 and WAC 296-24.
 2. Warning Labels: Provide labels of sufficient size to be clearly legible, displaying the following warning:

DANGER

CONTAINS ASBESTOS FIBERS

MAY CAUSE CANCER

CAUSES DAMAGE TO LUNGS

DO NOT BREATHE DUST

AVOID CREATING DUST

3. Warning Signs: Provide signs of sufficient size to be clearly legible, displaying the following warning:

DANGER

ASBESTOS

MAY CAUSE CANCER

CAUSES DAMAGE TO LUNGS

AUTHORIZED PERSONNEL ONLY

WEAR RESPIRATORY PROTECTION AND PROTECTIVE CLOTHING

IN THIS AREA

- J. Provide full body disposable protective clothing, including head, body and foot coverings including material impenetrable by asbestos fibers (Tyvek® or equivalent) for workers and authorized visitors in sizes adequate to accommodate movement without tearing.
- K. Provide additional safety and fall protection as necessary to workers and authorized visitors.
- L. Provide non-skid footwear to abatement workers. Ensure disposable clothing is adequately sealed to the footwear to prevent body contamination.
- M. Provide goggles to personnel engaged in asbestos operations when the use of a full-face respirator is not required.

PART 3 - EXECUTION

3.01 PERFORMANCE REQUIREMENTS

- A. Assume full responsibility and liability for compliance with federal, state, and local regulations pertaining to work practices, hauling, disposal, and protection of workers, visitors to Site, and building occupants in areas adjacent to work areas.
- B. Provide necessary labor, equipment, and material to remove, transport and dispose of ACM in accordance with Federal, State, and local regulations and standards. Work includes obtaining required permits, notifying appropriate agencies, and performing required air monitoring.
- C. In accordance with State of WAC 296-62, a good faith asbestos survey of each structure that is to be demolished has been conducted and provided by Sound Transit. A summary of findings is either shown on the Contract Drawings for each building to be demolished and/or provided in the individual reports available as reference documents. Review each survey and become familiar with its contents.
- D. Identify specific Hold Points in the Construction Work Plan. Sound Transit may add Hold Points at the Resident Engineer's discretion.
- E. *[Option 1 if not included in surveys provided] The Resident Engineer will provide destructive investigation and testing of suspect ACM uncovered during destructive investigation prior to abatement.*

[Option 2 if not included in surveys provided] The Contractor's HBM SME must complete destructive investigation and testing of suspect ACM uncovered during destructive investigation prior to abatement.

- F. Lead is assumed to be present in a variety of different building materials. Testing of lead content in individual buildings may or may not have been performed. All building materials must be tested by the contractor for waste designation lead content prior to disposal. *[Option 1] Representative test samples may be used for each type of building material, at the discretion of the Resident Engineer. [Option 2] Representative test samples may be used for each type of building material, at the discretion of the Contractor's HBM SME.*
- G. Perform Work necessary to adequately protect workers from lead exposures during the general demolition process and surface preparation activities.
- H. Perform Work measures necessary to adequately control dust during activities where lead-containing materials are disturbed as required by WAC 296-155 and air pollution standards as required by the Puget Sound Clean Air Agency (PSCAA).
- I. Asbestos containing pipe beneath the ground must be removed as necessary for construction activities. Protocols outlined in the Asbestos Work plan must be followed during removal of asbestos containing pipe.
- J. Lead Containing Paint is assumed to exist on most of the surfaces to be impacted by the construction and demolition activities. Conduct activities so as to minimize paint dust generation.
- K. Materials assumed to contain PCBs are present on the work Site as indicated on the Contract Drawings or in the HBM Survey reports.
- L. Handle, transport, and dispose of PCB-containing materials in accordance with current State and Federal regulations, including 40 CFR 761. PCB-containing materials may include transformers and fluorescent light ballasts.
- M. Complete clearance form prior to building demolition or re-entry.
- N. *[Option 2] Complete visual inspection during and following abatement to confirm HBM has been removed and suspect HBM is not encountered.*

3.02 EXAMINATION

- A. Take necessary precautions to avoid damage to existing structures, their appurtenances, monitoring wells, or utilities outside of the clearing limits that may be affected by work activities and are intended to remain following site development. Repair any damage to those features resulting from operations at no expense to Sound Transit. Be responsible for identifying structures that are to remain. Coordinate with the Resident Engineer and/or property owners to locate underground utilities prior to beginning construction. Do not disturb utilities encountered which were not previously shown or otherwise located without approval from the Resident Engineer.
- B. *[Option 1] Suspect ACM: If suspect ACM is discovered during abatement or demolition activities, notify Resident Engineer immediately and stop work in the immediate area. Cordon off area to prevent contamination of clean areas. Allow access for the Resident Engineer to collect a representative sample of the material and submit for testing using polarized light microscopy, as well as transmission electron microscopy if necessary. Coordinate with Resident Engineer to estimate quantity of additional suspect ACM for appropriate documentation.*

[Option 2] Suspect ACM: If suspect ACM is discovered during abatement or demolition activities, notify Resident Engineer immediately and stop work in the immediate area.

Cordon off area to prevent contamination of clean areas. Contractor HBM SME to collect a representative sample of the material and submit for testing using polarized light microscopy, as well as transmission electron microscopy if necessary. Submit estimated quantity of additional suspect ACM to Resident Engineer for appropriate documentation.

3.03 PREPARATION

- A. Establish a Control Area that includes a perimeter sufficient to perform the work around each building or area that contains lead or lead-coated materials. Include in the control area the pathway for transport of lead-containing material to a stockpile or storage area if the debris is not immediately transported from the site. Provide and display warning signs, in clearly visible areas, at entrances indicating that hazardous material work is being conducted and that unauthorized persons must not enter. Provide signs that comply with WAC 296-155 regulations.
- B. Restrict access to work sites by maintaining a daily log of personnel entering Work Areas, including workers and other authorized personnel and their start/stop times.
- C. Establish and post written emergency procedures within each Work Area, including emergency contact names and contact phone numbers, plans for medical emergencies, temporary loss of electrical power or water, and procedures for an emergency. Be responsible for establishing and posting contingency procedures to workers on site.
- D. Conduct health and safety meetings as required in Contract Documents.
- E. Utilities:
 - 1. Provide temporary power and lighting in the area where abatement is taking place and ensure safe installation of temporary power sources and equipment in accordance with applicable electrical code requirements. Use ground fault interrupters to service any temporary and existing power sources utilized during project performance. Refer to OSHA requirements for temporary lighting under the construction standards 29 CFR 1926 and WAC 296-62.
 - 2. Provide necessary water for the work. This includes potable water for abatement activities.
 - 3. Properly dispose of wastewater generated during the project, in accordance with Contract Documents and PSCAA Regulation III, Article 4.
 - 4. Be responsible for utility connections and subsequent disconnects. This includes repairs that may be necessary to restore the connection.
 - 5. Coordinate the use and shut down of utilities. Request and coordinate the use of, including the shutdown of electric service to work area and install temporary electric supply with ground fault interrupt protection.
 - 6. Prepare storm drains, floor and area drains, and drainage routes using the methods described in the approved work plan to prevent contaminated debris runoff.
- F. Asbestos Notifications: Prepare and apply necessary permits and notifications, amendments, and/or request for alternate means of compliance to the regulatory agencies including, but not limited to, Puget Sound Clean Air Agency (PSCAA) and Washington Department of Labor and Industries (L&I). Provide timely notification of asbestos removal, abatement, hauling and disposition as may be required by such agencies. Have a copy of all said permits and notifications at the Site.

G. Lead Preparation:

1. Prepare the decontamination unit for use at entrances and exits from the Work Area as described in the Lead Management Plan.
2. Prepare the lead-waste staging area as described in the Lead Management Plan.

H. PCB Preparation:

1. Segregate PCB-containing materials or components as necessary for compliance with regulations.
2. Take measures necessary to adequately protect workers from PCB exposures during the general demolition process.
3. Collect and analyze representative samples of the known material with PCBs to determine appropriate disposal methods.
4. *[Option 1] If suspect PCB-containing material is discovered during abatement or demolition activities, notify Resident Engineer immediately and stop work in the immediate area. Cordon off area to prevent contamination of clean areas. Allow access for the Resident Engineer to collect a representative sample of the material. Estimate quantity of additional suspect PCB to Resident Engineer for appropriate documentation.*

[Option 2] If suspect PCB containing-materials is discovered during abatement or demolition activities, notify Resident Engineer immediately and stop work in the immediate area. Cordon off area to prevent contamination of clean areas. Contractor HBM SME to collect a representative sample of the material and submit for chemical analytical testing. Estimate quantity of additional suspect PCB containing-materials to Resident Engineer for appropriate documentation.
5. Segregate PCB containing-material to be disposed of separate from general construction waste and Universal Waste.

3.04 REMOVAL

A. Asbestos Removal:

1. Spray asbestos material with amended water, using spray equipment capable of providing a “mist” application to reduce the release of fibers. Saturate the material sufficiently to wet it thoroughly. Spray the asbestos material repeatedly during work process to maintain wet condition and to minimize asbestos fiber dispersion.
2. After completion of stripping work, wire brush and/or wet sponge or clean surfaces from which asbestos has been removed, or clean by an equivalent method to remove visible material. Keep surfaces being cleaned wet during this work.
3. Place removed ACM in labeled disposal bags of 6-mils thickness immediately upon removal. Thoroughly clean the external surfaces of bags by wet sponging in the designated area of the work area. Place the waste bags in a second, clean bag at the waste loadout for disposal. Do not drop or drag the waste bags. Ensure that containers are removed from the regulated area by workers who have entered from uncontaminated areas dressed in clean coveralls. Ensure that workers do not enter from contaminated areas into the clean area during any phase of project performance.

4. Bag and secure ACM in a locked container at the end of each workday. Do not leave any debris, unsecured equipment, or tools on the work site past the end of each workday.
 5. Conduct work in a manner that prevents spread of ACM. Be responsible for the cost associated with cleanup of ACM spread outside the work areas.
 6. For Mini-Enclosures and Glove Bags of ACM, other than thermal system insulation, use a HEPA-filtered vacuum to maintain negative air pressure.
 7. The waste bags generated during a roofing abatement project may be slid through an enclosed chute directly into a lined waste bin. Otherwise, lower waste bags to the ground. Under no circumstances should waste bags be dropped.
 8. Asbestos-containing wallboard systems which contain less than one (1) percent ACM as a composite of the drywall and associated joint compound, must be removed by mechanical means, where practicable. If removal is accomplished by hand, then wet, non-aggressive methods and HEPA-filtered vacuums should be used followed by a prompt cleanup. For removal by hand, asbestos awareness and hands-on training as prescribed in WAC 296-62 is required for workers. Supervision is required by a competent person as defined in WAC 296-62.
- B. Lead Removal:
1. Perform removal of lead-containing items in accordance with the accepted Lead Management Plan. Use procedures and equipment required to limit occupational and environmental exposure to lead when lead-containing paint is impacted or when building components are demolished. Employ procedures that do not create the potential for contaminating surrounding areas or materials with lead-containing coatings or dust.
 2. Coordinate the work of trades to ensure that work is performed in accordance with the applicable regulations and that the control limits are maintained both inside and outside the control area.
 3. Access work areas through decontamination areas. Only allow access to the work area for appropriate workers, Subcontractors, authorized personnel, and project consultants.
 4. Prevent dust generation to the maximum extent practicable. Do not use dry scraping, dry sanding, or dry grinding on Lead-Containing Coatings or Lead contaminated surfaces without a full enclosure equipped with Negative Air System machines. Restrict the use of water to the smallest quantity necessary to minimize dust and to avoid the potential of contaminant migration through run-off or ponding. Never allow liquids generated during removal to come into contact with uncontaminated soils, drains, surfaces or conduits which may constitute a release to the environment.
 5. Perform removal in areas of lead containing paints in accordance with approved Work Plans. Use procedures and equipment required to limit occupational and environmental exposure to lead when lead-containing paint is impacted or when building components are removed.
 6. Handle, store and dispose of lead-coated debris in accordance with applicable federal, state and local requirements.
 7. Decontaminate personnel and equipment whenever people or equipment leave the work site as described in the Lead Management Plan. Package, store, label, and dispose of decontamination waste according to applicable requirements. Store

or dispose of contaminated equipment, tools or materials that cannot be decontaminated.

8. Inadequate health, safety or environmental precautions on the part of the Contractor or the belief that the Contractor's personnel, the general public or the environment are or may be exposed to an immediate hazard, may be cause for the Resident Engineer to suspend the site work and ask personnel to evacuate the hazard area. The Contractor will not be compensated for such delays.

C. PCB Removal:

1. Fluorescent Light Ballasts:

- a. Examine all fluorescent light ballasts for non-PCB labels. Remove and place in drums as PCB-containing if ballasts are not clearly labeled as such.
- b. If leaking ballasts are encountered, wrap them in plastic to prevent spills. Place sorbent material around them in the drum as an added measure of protection.
- c. Decontaminate contaminated light fixtures by wet wiping the surface, followed by a solvent wipe, followed by a second wet wipe.
- d. Dispose of the decontamination items as PCB containing-materials.

2. Transformers:

- a. Conduct sampling and analysis for characterization of the oil in transformers that may be encountered at the Site.
- b. Pump oils determined to contain regulated levels of PCBs into drums for off-site disposal.
- c. Ship the transformer carcass offsite for disposal. The decontamination of the transformers is usually conducted by the disposal facility. However, Contractor may propose to complete the work on Site. Perform the decontamination procedures in accordance with the requirements of the disposal facility. Propose the procedure to be used in the PCB Management Plan.

3. Handle and dispose of PCB-contaminated soils, concrete, and water as specified herein. Decontaminate equipment coming into contact with the contaminated material by triple-rinsing, as specified herein.

D. Mercury Removal:

1. Locate and remove mercury containing switches, thermostats, and equipment designated to be disposed of.
2. Place all mercury containing components into an impervious container packed with absorptive material.

E. Enclosure Systems:

1. Build suitable framing and line with fire rated 6 mil polyethylene sheeting sealed with tape at lap joints in the plastic for enclosures and decontamination enclosure system rooms.

2. For access between contaminated and uncontaminated rooms or areas, use an airlock. Use a curtained doorway for access between any two (2) rooms within the decontamination enclosure systems. Provide a minimum distance between two (2) curtained doorways of 6 feet.
3. Decontamination Enclosure System: Construct a decontamination enclosure contiguous to each isolation area including three (3) totally enclosed chambers as follows:
 - a. An equipment/waste loadout decontamination station including a wash-down room, holding room, and clean room for removal of equipment and materials from work area. Do not allow personnel to enter or exit isolation area through this unit.
 - b. A shower room with two (2) curtained doorways, one (1) to the equipment room and one (1) to the clean room. Supply the shower with at least one shower with hot and cold or warm water. Provide hot and cold water for showering. Pay careful attention to the shower enclosure to ensure against leaking of any kind. Ensure a supply of soap at all times in the shower room. Filter shower water through a 5 micrometer-filter system prior to disposal.
 - c. A clean room with one (1) curtained doorway into the shower and one (1) entrance or exit to non-contaminated areas of the building. Provide sufficient space in the clean room for storage of the workers' street clothes, towels, and other non-contaminated items.
4. Provide and post in the Equipment Room and the Clean Room the decontamination and work procedures to be followed by workers, as described in this Specification.
5. Ensure workers and authorized visitors, upon entering the job site, remove street clothes in the clean room and put on the required PPE.
6. Ensure workers and authorized visitors, each time they leave the work area, remove gross contamination from clothing before leaving the work area, proceed to the Equipment Room and remove all clothing except respirators. Still wearing the respirator, proceed naked to the showers, clean the outside of the respirator with soap and water while showering, remove the respirator, and thoroughly shampoo and wash themselves. Remove filters and wet them and dispose of filters in the container provided for the purpose, and wash and rinse the inside of the respirator. Ensure that following showering and drying off, each worker and authorized visitor proceed directly to the clean change room and dress in clean clothes at the end of each day's work, or before eating, smoking or drinking. Store contaminated work footwear in the Equipment Room when not in use in the work area. Upon completion of asbestos abatement, dispose of footwear as contaminated waste or clean thoroughly inside and out using soap and water before removing from work area or from equipment and access area. Dispose contaminated protective clothing in receptacles for disposal with other HBM contaminated material.
7. Work in a Mini-Enclosure area may be conducted wearing a double suit of protective clothing over street clothes. Decontaminate by HEPA-filtered vacuuming out suit completely and removing outer suit in the inner airlock chamber and proceeding to outer airlock to remove inner suit. Completely HEPA-filtered vacuum and wet wipe clean waste containers before removing from the inner airlock. Then double bag waste containers in the outer airlock and again HEPA-filtered vacuum and wet clean before removing from the outer airlock.

8. Ensure workers removing waste containers from the decontamination enclosure enter the shower room wearing a respirator and dressed in clean coveralls.
9. Do not allow workers to eat, drink, smoke, or chew gum or tobacco at the work site except in the established clean room.
10. Ensure workers are fully protected with appropriate respirators and protective clothing from the time of first disturbance of HBM prior to commencing actual asbestos abatement and until final clean-up is completed.
11. Ensure that barriers and plastic linings are effectively sealed and taped. Repair damaged barriers and remedy defects immediately upon discovery.
12. Visually inspect enclosures at the beginning of each work period. Dispersive smoke methods will be used to test effectiveness of barriers. Repair all damage immediately.
13. Clean external surfaces of contaminated containers and equipment thoroughly by wet cleaning before moving such items into the decontamination enclosure system for final cleaning and removal to uncontaminated areas.

3.05 FIELD QUALITY CONTROL

- A. While performing the work, site inspections may be carried out by Owner, L&I/WISHA, OSHA, EPA/Ecology inspectors and/or local building or health officials. If found to be in violation of pertinent regulations, cease work immediately until the violation is resolved. Contractor will be responsible for standby time required to resolve the violation. Provide complete sets of equipment (such as respirators and disposable clothing) that may be required for entry to the control area to the inspectors for inspection of the control area. Such requests will only be made during working hours.
- B. Asbestos Air Monitoring:
 1. Collect air samples required by regulations for the abatement activity on the project. These may include pre-abatement, area and perimeter, personal, short-term Excursion Limit, and clearance samples. The Resident Engineer may elect to conduct air sampling for quality assurance/quality control (QA/QC) purposes.
 2. Collect air samples in accordance with established procedures and protocols (i.e. NIOSH Method 7400, as revised). Take air samples at an approximate height of 60 inches from the work floor. Be responsible for regular calibration of the sample pumps.
 3. Submit the air samples to an independent qualified testing laboratory.
 4. Analyze the samples by phase contrast microscopy method by a third-party independent laboratory. Fiber concentrations detected above the allowable limit must be tested by transmission electron microscopy method at the contractor's expense. Transmit air sample results.
 5. Take pre-abatement samples prior to start of asbestos activities in accordance with WAC 296-62-077 and where Negative Air System enclosures will be constructed. Obtain the sample during a period where there are no activities. If the fiber count exceeds 0.01 f/cc, then re-sample the area prior to completion of enclosure.
 6. Ensure the area samples inside an enclosure do not exceed 1.0 f/cc. If such concentration is detected, stop work immediately to evaluate the work procedures. Clean the work with HEPA-filtered vacuuming and wet cleaning. Take another sample to demonstrate that the fiber count is below 0.01 f/cc. The work may start

after the cleaning has been completed and in accordance with procedural revisions that may be agreed upon with the Resident Engineer.

7. Take the perimeter air samples upwind and downwind of the work area where there is no enclosure. Obtain the perimeter samples for a Negative Air System enclosure at the personnel decontamination station, waste loadout, and HEPA-filtered/Negative Air System machine exhaust(s). If the fiber count exceeds 0.01 f/cc, the Resident Engineer may request analysis of the sample by transmission electron microscopy procedure; the Resident Engineer may request to clean the perimeter area prior to start of a shift.
8. Take personal and short-term exposure limit (STEL) samples as required by the activities and the regulations. Post the personal air sample test results within 24-hours from collection.
9. Take the clearance air sample at the completion of abatement activities prior to inspection and encapsulation. Take additional clearance samples if the area fails inspection, requiring additional abatement. For acceptable fiber count, use the pre-abatement result or less than 0.01 f/cc, whichever is less.
10. If there is a conflict between the Contractor sample test results and the Resident Engineer's QA/QC sample test results, re-take the sample. Repeat if necessary, until the test results are in the same range, as determined by the Resident Engineer.
11. Limit the maximum flow rate of collecting air samples to 2.5 liters/minute for personal samples and 10.5 liters/minute for inside and outside work area air samples.

C. Lead Air Monitoring:

1. No simple relationship exists between the concentration of lead in paint and the potential worker exposure if lead becomes airborne. Evaluate whether or not workers are exposed to concentrations in air in excess of the action level of 0.03 milligram per cubic meter (mg/m^3). If the action level is exceeded, requirements for training, medical monitoring, and air sampling is triggered. If the PEL of 0.05 mg/m^3 is exceeded, more requirements must be met, including use of respiratory protection equipment.
2. Monitor airborne concentrations of lead in accordance with WAC 296-155-176, and as specified herein. Perform air monitoring, testing, and reporting using the CIH or the Site Safety and Health Officer (SSHO).
3. Transmit results of air monitoring samples within 24 hours after the air samples are taken. Notify the Resident Engineer immediately of exposure to lead at or in excess of the action level of 30 micrograms per cubic meter of air outside of the lead control area.
4. The CIH is responsible for reviewing analytical sample results, and proposing all corrective action needed.
5. If the area air monitoring results are above the action level of 30 micrograms, the Resident Engineer has the option of stopping work until the work procedures and lead hazard controls are revised to the satisfaction of the Resident Engineer.

3.06 CLEANING

A. Asbestos Cleaning:

1. Remove visible accumulations of asbestos material and debris. Wet-clean all surfaces within the work area.
2. Ensure the windows, doors, and HVAC vents remain sealed and any HEPA filtration Negative Air System, air filtration and decontamination enclosure systems remain in service during cleaning operations.
3. Clean all surfaces in the work area and other contaminated areas with water and/or with HEPA-filtered vacuum equipment. After cleaning the work area, allow surfaces to dry completely (six (6) hours minimum) and again wet-clean or clean with HEPA-filtered vacuum equipment surfaces in the work area.
4. *[Option 1] After completion of the second cleaning operation and after the surface has dried, a complete visual inspection must be performed by the abatement Contractor of the work area to ensure that the work area is dust-free. If the inspection indicates that removal and clean-up performance is satisfactory as determined by the Resident Engineer, the work area will be sampled under aggressive conditions.*

[Option 2] After completion of the second cleaning operation and after the surface has dried, a complete visual inspection must be performed by Contractor's HBM SME of the work area to ensure that the work area is dust free. If the inspection indicates that removal and clean-up performance is satisfactory as determined by the Contractor's SME, the work area will be sampled under aggressive conditions.
5. *[Option 1] Where encapsulant is used following a period of time sufficient to allow the encapsulant to dry completely, remove plastic sheeting covering walls and floors and dispose of as ACM waste. Surfaces exposed by the removal of plastic sheeting on walls and floors will be thoroughly cleaned using acceptable methods. If underlying surface cleaning is not satisfactory as determined by the Resident Engineer, reclean all surfaces. Leave critical barriers including plastic sheets covering doors, vents, windows, air plenum grills, and the decontamination barriers in place during final (aggressive) air testing. If project performance is not satisfactory as determined by the Resident Engineer, reclean all surfaces.*

[Option 2] Where encapsulant is used following a period of time sufficient to allow the encapsulant to dry completely, remove plastic sheeting covering walls and floors and dispose of as ACM waste. Surfaces exposed by the removal of plastic sheeting on walls and floors will be thoroughly cleaned using acceptable methods. If underlying surface cleaning is not satisfactory as determined by the Contractor's HBM SME, reclean all surfaces. Leave critical barriers including plastic sheets covering doors, vents, windows, air plenum grills, and the decontamination barriers in place during final (aggressive) air testing. If project performance is not satisfactory as determined by the Contractor's HBM SME, reclean all surfaces.
6. Include sealed drums and equipment used in the work area in the clean-up and removal from work areas, via the waste load out system, at an appropriate time in the cleaning sequence.
7. *[Option 1] Final inspections must be conducted by the Resident Engineer on each work area. When a final inspection and testing determines that the area is free of visible accumulation of dust and ambient air is within control limits for "clean air" – (less than 0.01 f/cc) – remove any decontamination enclosure systems for the cleaned area and thoroughly wet clean. Dispose of materials from the Equipment Room and shower as contaminated waste. Ensure the Contractor, abatement contractor and Resident Engineer carry out a final check to ensure that no dust or debris remains on surfaces as a result of dismantling operations.*

[Option 2] Final inspections must be conducted by the Contractor's HBM SME on each work area. When a final inspection and testing determines that the area is free of visible accumulation of dust and ambient air is within control limits for "clean air" – (less than 0.01 f/cc) – remove any decontamination enclosure systems for the cleaned area and thoroughly wet clean. Dispose of materials from the Equipment Room and shower as contaminated waste. Ensure the Contractor, abatement contractor and HBM SME carry out a final check to ensure that no dust or debris remains on surfaces as a result of dismantling operations.

B. Lead Cleaning:

1. Maintain surfaces of the lead control area as free of accumulations of paint chips and dust as practicable. Restrict the spread of dust and debris and keep waste from being distributed over the work area. Do not use compressed air to clean up the area. At the end of each shift, clean the area of visible lead paint contamination by vacuuming with a HEPA-filtered vacuum cleaner and wet mopping the area.
2. *[Option 1] Final inspections must be conducted by the Resident Engineer on each work area.*

[Option 2] Final inspections must be conducted by the Contractor HBM SME on each work area.
3. Collect and analyze representative samples of construction debris for toxicity characteristic leaching procedure (TCLP) analysis as required under WAC 173-303 to determine appropriate disposal methods.
4. Segregate lead components to be disposed of separate from general construction waste as determined by the TCLP test results as required by WAC 173-303. Include the proper packaging and disposal of lead-containing items in the Work.
5. Collect lead-containing waste, scrap, debris, bags, containers, equipment, and lead-contaminated clothing that may produce airborne concentrations of lead particles. Label the containers in accordance with 29 CFR 1910.

- C. Complete Certificate of Clearance documentation and certify abatement is complete and the building is approved for demolition or re-occupancy. Abatement contractor must complete form, transmit the clearance form to the Resident Engineer and post a copy at each site/building.

3.07 PROTECTION

A. PCB:

1. Spills: Be responsible for all PCB spills caused as a result of operations. Cordon off the area of the spill and remove and dispose of the contaminated material at own expense.
2. For PCB-contaminated debris to be decontaminated, flush the surfaces of the debris three times with a solvent containing less than 50 parts per million (ppm) PCB. Use a solvent with solubility of PCBs equal to five percent or more by weight. Use a volume of the normal diluent in each rinse equal to approximately ten percent of the PCB container capacity. The solvent may be reused for decontamination until it contains 50 ppm PCB. Dispose of the solvent as a PCB in accordance with TSCA requirements specified in 40 CFR 761. Dispose of non-liquid PCBs resulting from the decontamination procedures in accordance with the provisions of TSCA requirements specified in 40 CFR 761.

B. Decontamination Procedures:

1. Design and construct temporary decontamination facilities such that they can be readily moved to different locations on the Site, if necessary
2. Wash down decontamination facilities regularly to remove buildup of sediments. The sediments may be disposed as bulk hazardous waste.
3. Promptly repair damage to the decontamination facilities.
4. Individually decontaminate equipment with the following procedures:
 - a. Physically remove packed dirt and debris.
 - b. First Rinse – Rinse the structure’s surfaces using potable water; collect and dispose of the rinsate.
 - c. Second Rinse – High pressure wash the surfaces of the equipment using an oil penetrating detergent solution; collect and dispose of washings. Use an application of water or steam sprays that has sufficient temperature, pressure, residence time, agitation, and detergent to remove hazardous materials from surfaces or to remove contaminated debris surface layers. Alternatively, scrub the surface with brush and solvent.
 - d. Third Rinse – Rinse the structure’s surface a third time using potable water; collect the washings for analysis.

3.08 PCB, LEAD (PB) AND MERCURY TRANSPORTATION AND DISPOSAL

A. Asbestos Disposal:

1. Bag gross asbestos debris by the end of each workday. Dispose of ACM Waste as the work progresses within 10-days as required by PSCAA Regulation III, Article 4 and to prevent exceeding available storage capacity on site. Provide caution signs as specified herein. Remove sealed and labeled containers as asbestos waste and dispose of containers at an authorized disposal site in accordance with the requirements of the Puget Sound Clean Air Agency. Transport in a vehicle compartment completely lined with 6 mil polyethylene sheeting and dispose of at the permitted disposal site. Transmit documentation including name and address of landfill, name of landfill employee authorized to accept asbestos waste, quantity removed from work site, and quantity disposed of at the landfill.
2. For hauling and disposal, comply with 40 CFR 61 and state, regional, and local standards. Ensure workers unloading material wear appropriate PPE when handling asbestos materials at the disposal site.
3. Only UNDAMAGED and sealed containers and/or plastic bags will be disposed of in the landfill. If the bags have been broken or damaged, place the damaged bags in a sealed drum and dispose.

B. PCB, Lead and Mercury Disposal:

1. Handle, label, store, transport, and dispose lead (Pb), mercury, PCBs-waste in accordance with 40 CFR 260, 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 264, 40 CFR 265, 40 CFR 268, 40 CFR 273 and WAC 173-303 and other applicable regulations and requirements.
2. The Resident Engineer will provide a Generator EPA Identification Number for manifesting hazardous waste. Complete manifesting of hazardous waste in conformance with EPA, DOT, and all other applicable federal, state, and local

regulation. For disposal of all hazardous waste, obtain the signature of Sound Transit's Hazardous Materials Coordinator or an individual delegated with such authority by Sound Transit on the Generator's Certification portion of the Uniform Hazardous Waste Manifest.

3. Employ only Transporter and Disposal Facilities that have EPA identification numbers. Transmit the name, address, and EPA Identification Number of the Transporter and Disposal Site to the Resident Engineer for review and approval prior to the disposal of hazardous waste.
4. Disposal Documentation: Transmit written evidence that the hazardous waste treatment, storage, or disposal facility (TSD), or recycling facility is approved for PCB disposal or recycling by the EPA and State or local regulatory agencies. Transmit one (1) copy of the completed manifest, as well as the certificates of disposal/destruction from the landfill or treatment facility signed and dated by the initial transporter in accordance with 40 CFR 262 as part of the close-out activities.
5. If the waste is shipped as bulk, line the truck bed and cover the waste with plastic sheeting.

3.09 CLOSE OUT ACTIVITIES

A. [Option 1] Closeout documents:

1. *Documentation of HBM air monitoring results:*
 - a. *Copies of air monitoring sample chains-of-custody.*
 - b. *Analysis reports.*
2. *Completed Certificate(s) of Clearance Forms (Exhibit A).*
3. *Record of HBM abatement activities including all Contract changes clearly indicated, project photographs, supervisor's daily field reports, and similar final record documentation. Project photographs will show conditions before and after HBM removal.*
4. *Copies of waste profiles, transportation, disposal certification, and signed manifests from each landfill or TSD facility within 30 days of completion. Documentation must include:*
 - a. *Name and address of landfill or TSD.*
 - b. *Name of landfill or TSD employee authorized to accept waste.*
 - c. *Quantity removed from work site.*
 - d. *Quantity disposed of at landfill.*
 - e. *Waste manifests for asbestos, dangerous waste or hazardous waste.*

B. [Option 2]: Closeout documents:

1. *Daily reports during abatement. Daily field reports must be completed by the HBM SME. At a minimum, include the following in daily report:*
 - a. *Site Conditions.*
 - b. *Detailed work activities.*
 - c. *Progress.*
 - d. *Unusual events.*

- e. *Visual Inspection.*
 - f. *Air Sampling Data Sheets*
 - g. *Bulk Sampling Sheets.*
 - h. *Chain of Custody forms.*
 - i. *Daily observations inside the containment area.*
 - j. *Photo documentation of abatement.*
 - k. *Schedule: Plan vs Actual.*
2. *Closeout report for each project parcel. Resident Engineer may approve a single closeout report for the entire project. The HBM closeout reports should be completed by the HBM SME. At a minimum, include the following in the HBM closeout report:*
- a. *Record of HBM abatement activities including all Contract changes clearly indicated, project photographs, supervisor's daily field reports, and similar final record documentation. Project photographs will show conditions before and after HBM removal.*
 - b. *Copy of permits required to complete abatement.*
 - c. *Summary of new HBM discovered during abatement:*
 - 1) *Sample locations and analysis results.*
 - 2) *Copies of air monitoring sample chains-of-custody.*
 - 3) *Analysis reports.*
 - d. *Documentation of HBM air monitoring results:*
 - 1) *Copies of air monitoring sample chains-of-custody.*
 - 2) *Analysis reports.*
 - e. *Completed Certificate(s) of Clearance Forms (Exhibit A).*
 - f. *Copies of waste profiles, transportation, disposal certification, and signed manifests from each landfill or TSD facility within 30 days of completion. Documentation must include:*
 - 1) *Name and address of landfill or TSD.*
 - 2) *Name of landfill or TSD employee authorized to accept waste.*
 - 3) *Quantity removed from work site.*
 - 4) *Quantity disposed of at landfill.*
 - 5) *Waste manifests for asbestos, dangerous waste or hazardous waste.*

END OF SECTION (TECHNICAL SPECIFICATIONS)

EXHIBITS (On Proceeding Pages)

1. **Exhibit A** – Hazardous Building Materials – Certificate of Clearance – Contractor Certification of Visual Inspection.

Exhibit A - SECTION 02 83 66

HAZARDOUS BUILDING MATERIALS CERTIFICATE OF CLEARANCE

CONTRACTOR CERTIFICATION OF VISUAL INSPECTION

The Contractor's supervisor/competent person hereby certifies that they have visually inspected the work area (all surfaces including pipes, beams, ledges, walls, ceiling and floor, Decontamination Unit, sheet plastic, etc.) and has found no dust, debris or residue.

Identity of Work Area: _____

by: (Signature of Supervisor/Competent Person) _____

Date _____

(Print Name/Title) _____

Certificate # _____

Expiration Date _____

CONTRACTOR'S AIR CLEARANCE CERTIFICATION

The Contractor hereby certifies that he/she has conducted air clearance sampling according to the specifications and this sampling is valid to the best of his/her knowledge and belief. Contractor must attach chain of custody and final laboratory results.

Identity of Work Area _____

Air Sample Identification #: _____

Flow Rate: _____ Volume _____

Air Sampling Results: _____ Analyzed By: _____

Time Sample Taken: _____

APPROVAL FOR DEMOLITION OR RE-OCCUPANCY

by: (Signature) _____ Date _____

RECEIVED BY OWNER _____ Date _____

END OF EXHIBITS