PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. Perform all planning, administrative, execution, and cleaning requirements necessary to safely remove the asbestos-containing materials and asbestos-contaminated materials as indicated in the Work Order, exercising care and taking safety precautions and protective measures as necessary to prevent damage to the Owner's property.

B. Identify location and amount of all asbestos-containing materials and asbestos-contaminated materials to be removed. Include review of Drawings when provided with the Work Order.

1.2 RELATED WORK

A. Section 01 11 01 “Summary of Work – Regulated Materials”

B. Section 02 80 00 “Facility Remediation”

C. Section 02 83 00 “Heavy Metal-Related Activities”

D. Section 02 84 00 “Polychlorinated Biphenyl Remediation”

E. Section 02 87 00 “Water Loss Response”

F. Section 02 88 00 “Biological Contaminants”

G. Section 02 90 00 “Environmental Procedures”

H. JOC Abatement Design Scope for this Work Order

1.3 WORK INCLUDED

A. The Work site is the University of Washington or as defined in the particular Work Order.

B. Contractor shall furnish all labor, materials, services, permits, insurance (specifically covering the handling and transportation of Asbestos-Containing Material, Asbestos-Containing Construction Material, Asbestos-Contaminated Materials, and Asbestos-Containing Waste Material), special permits, and equipment necessary to remove and dispose of asbestos-containing materials (ACM) and debris within the work areas in the particular Work Order. The Contractor shall follow all federal, state, and local ordinances and regulations or rules pertaining to hazardous building materials, including storage, transportation, and disposal. The Contractor shall field verify all site conditions and access.

C. Personal air monitoring required for the safety of the Abatement Contractor's workers.

D. Proper cleaning of contaminated building fixtures and components.

E. Proper disposal of asbestos-containing materials and debris, and asbestos-contaminated materials.

1.4 WORK NOT INCLUDED

A. Quality assurance air monitoring for the Owner by Environmental Consultant.

B. Reconstruction of areas where materials and systems were removed, unless otherwise indicated by the Work Order.

1.5 GENERAL REQUIREMENTS

A. The General Contractor shall exercise general supervisory authority over the asbestos-related work as required by WAC 296-62-07706. As supervisor of the Work, the General Contractor shall ascertain whether any and all other subcontractors are in compliance with the asbestos regulations, and shall require such subcontractor to come into compliance with the asbestos regulations when necessary.

B. The Contractor is responsible to notify and provide all necessary communications to the responsible regulatory agencies for all required work.

C. Quality assurance and positive client relations are critical to the Work of this Contract, as most of the abatement Work will occur near or adjacent to occupied areas.

D. All required permits and notifications shall be kept valid for the duration of the work. This includes any permit and/or notification revisions, such as changes of abatement dates, shift times, work locations, Contractor personnel, etc.

E. The Contractor is responsible to take appropriate measures ensuring that the project site will be safeguarded from contamination during the asbestos abatement work.

F. Any asbestos-containing material that has not been removed for this project, that will be contacted by any work, or exposed surfaces are created by spot abatement activities, shall be encapsulated with an approved bridging encapsulant.

G. All work is to be performed in accordance with applicable codes, standards, regulations, and accepted industry practices. This includes compliance with regulatory requirements applicable at the time the work is performed. All work, including work practices, is to be craftsman-like and is subject to inspection by the Owner or their designated representative.

H. Contractor shall have a record of successful experience in asbestos removal and related work similar in scope and magnitude to this Work Order. Contractor shall have valid licenses and certifications as a Contractor and as an Asbestos Abatement Contractor in the State of Washington.

I. Maintain on site, a full-time Certified Asbestos Supervisor during asbestos abatement activities. Supervisor must be approved by the Environmental Consultant and Owner's Representative prior to the start of the Work Order and shall not be changed without receiving prior approval from the Environmental Consultant and Owner's Representative. The site Supervisor shall have a minimum of five years supervisory experience in the administration and supervision of asbestos abatement projects including work practices, protective measures for building and personnel, disposal procedures, etc. The site Supervisor shall be the Contractor's representative responsible for compliance with all applicable federal, state, and local regulations, particularly those relating to asbestos. The site Supervisor shall be fully authorized by the Contractor to make all decisions necessary to perform the Work.

J. All employees involved in asbestos removal activities shall be the bearers of a Certified Asbestos Worker cards issued by the Washington State Department of Labor and Industries (L&I) Division of Occupational Safety and Health (DOSH). All employees involved in asbestos abatement activities shall be the bearers of a current Certified Asbestos Worker cards issued by the DOSH. Cards or training records shall be available for inspection at the jobsite. The Contractor shall also provide, as a minimum, one (1) person certified by L&I as an Asbestos Abatement Supervisor and this person shall be responsible for overall abatement activities. This person shall be immediately available on-site when any work is done. If abatement work is performed on multiple shifts, each shift shall have a certified Asbestos Abatement Supervisor.

K. Use of the Site: Confine operations at the site to the areas permitted under the Contract. Portions of the site beyond areas on which work is indicated are not to be disturbed.

L. Keep public areas such as hallways, stairs, elevator lobbies, and restrooms free of accumulation of waste, rubbish, and construction debris.

M. Smoking or open fires will not be permitted within the building enclosure or on the premises.

N. Site Conditions: The removal area may have functioning water, sewer, laboratory waste, and electrical systems in the Work Area. The Contractor shall verify location of all equipment and protect and maintain it as required.

O. Contractor is responsible for all air sampling for compliance with DOSH and other local, state, and federal compliance.

P. On-site Observation:

1. The safety and protection of the Contractor's employees, sub-contractor's employees, Owner's employees, consultant, the facility, and the public is the sole responsibility of the Contractor.

2. The Owner or Environmental Consultant, or representatives of local, state, or federal agencies may make unannounced visits to the site during the work. The Contractor shall provide two (2) complete sets of clean, protective clothing and respirators with the same protection factor as required in the regulated area available daily for such visitor use. It is the visitor's responsibility to ensure all necessary medical qualification, training, and respirator fit test certificates are current prior to using any respirator or protective clothing provided by the Contractor.

Q. If the Environmental Consultant, or representatives of local, state, or federal agencies visitor determines that practices are in violation of applicable regulations, or are endangering workers, the general public or the facility, they will immediately notify the Owner's Representative verbally that operations must cease until corrective action is taken.

1.6 PERSONNEL PROTECTION

A. Contractor acknowledges and agrees that he or she is solely responsible for enforcing worker protection requirements at least equal to those specified in this section.

B. Training Program as follows:

1. Prior to commencement of Work, all workers shall receive training in the proper handling of asbestos-containing materials, including all aspects of work procedures and protective measures, use of protective clothing and respiratory protection, use of showers, entry and exit procedures from Work Areas, and in DOSH and OSHA regulations.

2. Each worker shall understand the health implications and risks involved, including the illness possible from exposure to airborne asbestos fibers, and understand the use and limits of the respiratory equipment to be used. Each worker shall also understand the purpose of medical surveillance and the monitoring of airborne asbestos as related to health and respiratory equipment.

3. Emergency evacuation procedures to be followed in the event of worker injury or compressor failure or other emergencies shall be included in the worker training program. The training program shall comply with federal, state, and local regulations.

C. Respirators as follows:

1. Contractor shall provide workers with respiratory equipment approved by NIOSH, OSHA, and DOSH for the type of Work being performed. Respiratory equipment instructions shall be posted in the Clean Room.

2. Where respirators with disposable filters are used, provide sufficient filters for replacement as necessary by the workers, or as required by applicable regulations.

3. Provide respiratory protection as appropriate and needed from the time of the first operation involving contact with asbestos-containing materials (including construction of airtight barriers/barricades, and placing of polyethylene sheeting on walls) until acceptance of final air test results by the Environmental Consultant.

D. Personal Protective Equipment as follows:

1. Work clothes shall consist of disposable full-body coveralls, head covers, boots, rubber gloves or equivalent. Sleeves at wrists and cuffs at ankles shall be secured. Fire retardant full-body coveralls are required in areas of open flame, or where required by local regulations.

2. Eye protection and hard hats shall be available as appropriate or as required by applicable safety regulations.

3. Provide workers with sufficient sets of protective disposable clothing, consisting of full-body coveralls, head covers, gloves, and foot covers, of sizes to properly fit individual workers.

E. Contractor shall be solely responsible for scheduling all necessary air sample analysis by an independent testing laboratory for compliance of his or her respiratory protection with DOSH and OSHA regulations. Contractor shall pay for all costs associated with such testing.

F. Permit no visitors, except for governmental inspectors having jurisdiction, or as authorized by the Environmental Consultant or Owner’s Representative, in the Work Areas after commencement of asbestos disturbance. Provide authorized visitors with suitable respirators and protective equipment.

G. Leave reusable equipment, apparel, and protection devices (excluding respirators) in the Equipment Room until the end of the asbestos abatement Work, at which time such items shall be disposed of as contaminated waste or decontaminated for reuse.

H. Provide, in addition to respirators and protective clothing for authorized visitors, protective clothing and a Type C respirator with extra air hoses for use by the Environmental Consultant. Furnish protective clothing in as many sets as required for onsite project monitoring by the Environmental Consultant.

I. Provide and post in the Equipment Room and the Clean Room the asbestos removal decontamination and Work procedures to be followed by workers.

1.7 DEFINITIONS

A. Definitions in General Use:

1. Approved: Where used in conjunction with the Environmental Consultant's response to submittals, requests, applications, inquiries, reports and claims by the Contractor, the meaning of term "approved" will be held to limitations of the Environmental Consultant's responsibilities and duties as specified in General and Supplementary Conditions. In no case will "approval" by the Environmental Consultant be interpreted as a release of the Contractor from responsibilities to fulfill the requirements of the Contract Documents.

2. Directed, Requested, etc.: Where not otherwise explained, terms such as "directed," "requested," "authorized," "selected," "approved," "required," "accepted," and "permitted" mean "directed by the Environmental Consultant," "requested by the Environmental Consultant," and similar phrases. However, no such implied meaning will be interpreted to extend the Environmental Consultant's responsibility into the Contractor’s responsibility for construction supervision.

3. Equivalent: Except as otherwise defined in greater detail, term "equivalent" is used to mean substitution for substantially the same product with approval by Environmental Consultant and Owner.
4. Furnish: Except as otherwise defined in greater detail, term "furnish" is used to mean supply and deliver to the Project Site, ready for unloading, unpacking, assembly, installation, etc., as applicable in each instance.
5. Indicated: The term "indicated" is a cross-reference to graphic representations, notes or schedules on drawings, to other paragraphs or schedules in the Specifications, and to similar means of recording requirements in Contract Documents. Where terms such as "shown," "noted," "scheduled," and "specified" are used in lieu of "indicated," it is for the purpose of helping the reader locate cross-reference, and no limitation of location is intended, except as specifically noted.
6. Install: Except as otherwise defined in greater detail, term "install" is used to describe operations at the Project Site including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning and similar operations, as applicable in each instance.
7. Installer: The term "installer" is defined as the entity (person or firm) engaged by the Contractor for performance of a particular unit of Work at the Project Site, including installation, erection, application and similar required operations. It is a general requirement that such entities (Installers) be experts in operations they are engaged to perform.
8. Provide: Except as otherwise defined in greater detail, term "provide" means furnish and install, complete and ready for intended use, as applicable in each instance.
9. Contractor: Contractor awarded this project.
10. Owner and Owner's Representative: All parties involved in the project who are employed by the University of Washington (UW), or specifically the UW Construction Manager.

B. Definitions Relative to Asbestos Abatement:

1. Abatement: Procedures to control fiber release from asbestos-containing construction materials. Includes removal, encapsulation, and enclosure.
2. ACGIH: American Conference of Governmental Industrial Hygienists www.acgih.org .
3. Aerosol: A system consisting of particles, solid or liquid, suspended in air.
4. Airlock: A system for permitting ingress and egress with minimum air movement between a contaminated area and an uncontaminated area, typically consisting of two curtained doorways at least three feet apart.
5. Air Monitoring: The process of measuring the fiber content of a known volume of air collected during a specific period of time. The procedure most commonly utilized in industry for asbestos follows the WISHA reference method outlined in WAC 296 62 07735, Appendix A, and WAC 296 62 07737, Appendix B.
6. Amended Water: Water to which a surfactant has been added in order to accomplish more thorough penetration and saturation of the asbestos-containing material.
7. ANSI: American National Standards Institute www.ansi.org .
8. Asbestos: (29 CFR 1926.1101) includes Chrysotile, Amosite, Crocidolite, Tremolite asbestos, Anthophyllite asbestos, Actinolite asbestos, and any of these minerals that has been chemically treated and/or altered.

9. Asbestos-Containing Material (ACM): Material composed of asbestos of any type in an amount greater than 1 percent by weight, either alone or mixed with other fibrous or non-fibrous materials.
10. Asbestos-Containing Waste: Asbestos-containing or contaminated materials or objects requiring disposal.
11. Asbestos Fibers: Asbestos fibers having an aspect ratio of at least 3:1, and that are 5 micrometers or more in length.
12. ASTM: American Society for Testing and Materials www.astm.org .
13. Authorized Visitor: The Owner's Project Team members, the Environmental Consultant, emergency personnel, or a representative of any federal, state and local regulatory agency having jurisdiction over the Work.
14. Barrier: Any surface that seals off the Work Area to inhibit the movement of asbestos fibers.
15. Breathing Zone: A hemisphere forward of the shoulders with a radius of approximately 6 to 9 inches.
16. Bridging Encapsulant: The application of a sealant over the surface of asbestos-containing material to prevent the release of asbestos fibers.
17. Certified Asbestos Contractor: A Contractor licensed by the State of Washington and certified by the Department of Labor and Industries in accordance with Chapter 296-65 of the Washington Administrative Code (WAC).
18. Certified Asbestos Supervisor: The Certified Asbestos Contractor's representative at the Work Site who is certified by the Washington Department of Labor and Industries in accordance with Chapter 296-65 of the WAC.
19. Certified Asbestos Worker: An individual who is certified by the Washington Department of Labor and Industries in accordance with Chapter 296-65 of the WAC.
20. Certified Industrial Hygienist (CIH.): An industrial hygienist certified in Comprehensive Practice by the American Board of Industrial Hygiene.
21. Class I Asbestos Work: Activities involving the removal of thermal system insulation (TSI) or surfacing ACM or PACM.
22. Class II Asbestos Work: Activities involving the removal of ACM, which is not TSI or surfacing material. This includes, but is not limited to, the removal of asbestos-containing wallboard, floor tile and sheeting, roofing and siding shingles, and construction mastics.
23. Class III Asbestos Work: Repair and maintenance operations where “ACM”, including TSI and surfacing ACM and PACM, may be disturbed.
24. Class IV Asbestos Work: Maintenance and custodial activities during which employees contact but do not disturb ACM or PACM and activities to clean up dust, waste and debris resulting from Class I, II, and III activities.
25. Clean Room: An uncontaminated area or room that is part of the worker decontamination enclosure with provisions for storage of workers' street clothes and protective equipment.
26. Contained Work Area: A Work Area that has been isolated, plasticized, and equipped with a negative air pressure system and a Decontamination Enclosure System.
27. Competent Person: The individual onsite (a representative of the Contractor) who is capable of identifying existing asbestos hazards in the workplace and selecting the appropriate control strategy for asbestos exposure, and who has the authority to take

prompt corrective measures to eliminate them as specified in WAC 296-62-07728. The competent person shall meet all requirements specified in WAC 296-62-07728. The competent person shall be certified as an asbestos supervisor in compliance with WAC 296-65-030(3) and 296-65-012.

28. Contractor: The Certified Asbestos Contractor selected/hired by the Contractor awarded this project to perform the Work described in the Work Order and/or on the Drawings.

29. Critical Barrier: Seal applied to openings connecting the abatement area with adjacent spaces that will not be included in the containment. Critical barriers shall not be exposed to the gross removal environment. Examples of openings requiring critical barriers include, but are not limited to: HVAC vents and diffusers; doorways; windows; floor, wall, and ceiling penetrations; and air plenums.

30. Curtained Doorway: A device to allow ingress or egress from one area to another while permitting minimal air movement between the areas. Typically constructed by placing three overlapping sheets of plastic, that has weights at the bottom, over an existing or temporarily framed doorway, securing each along the top of the doorway, and securing the vertical edge of the outer two sheets along the opposite vertical edge of the inner sheet.

31. Decontamination Enclosure System: A series of connected rooms, with airlocks or curtained doorways between any two adjacent rooms, for the decontamination of workers or of materials and equipment. A Decontamination Enclosure System always contains at least one air lock to the Work Area.

32. Differential Pressure System: A containment system utilizing HEPA machines in an airtight enclosure.

33. Disposal Bag: A properly labeled 6-mil thick, leak-tight plastic bag used for transporting asbestos waste from Work Site to disposal site.

34. DOSH: The Washington State Department of Labor and Industries' Division of Occupational Safety and Health www.lni.wa.gov .

35. Encapsulant: A material which is applied to asbestos-containing material to reduce or control the potential release of asbestos fibers from the material, either by creating a membrane over the surface (bridging encapsulant), or by penetrating into the material and binding its components together (penetrating encapsulant).

36. Encapsulation: All herein-specified procedures necessary to apply an encapsulant to Asbestos-Containing Materials to control the possible release of asbestos fibers into the ambient air.

37. Enclosure: A semi-air tight system used to segregate and isolate an asbestos abatement area, and which is continuously served by a negative pressure ventilation system once abatement activities start.

38. Environmental Consultant: Third party consultant hired by the Owner, a representative of the Owner's Regulated Materials Management group, or other Owner-designated Environmental Consultant.

39. EPA: U.S. Environmental Protection Agency www.epa.gov .

40. Equipment Decontamination Enclosure: That portion of a Decontamination Enclosure System designed for controlled transfer of materials, waste containers and equipment, typically consisting of a Washroom and a Holding Area.

41. Equipment Room: A contaminated area or room that is part of the Worker Decontamination Enclosure System, with provisions for storage of contaminated clothing and equipment.
42. Excursion Limit: The maximum personal exposure concentration of asbestos fibers in air for any 30-minute period (1.0 fiber per cubic centimeter of air [f/cc]).
43. Fixed Object: A unit of equipment or furniture or other building component that cannot be detached from the building or can be detached only by destructive methods resulting in irreparable damage to the item.
44. Friable Asbestos Material: Any material containing more than 1 percent asbestos as determined using the method specified in Appendix A, Subpart F, 40 CFR Part 763 Section 1, Polarized Light Microscopy, that, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure.
45. Friable Upon Removal: A non-friable material, which becomes friable when disturbed during removal.
46. Glovebag Method: A method for removing small amounts of friable asbestos-containing material from fireproofed beams, HVAC ducts, short piping run, valves, joints, elbows, and other non-planar surfaces in a non-contained (plasticized) work area. The glovebag assembly is a manufactured or fabricated device consisting of a bag (typically constructed of plastic), two inward projecting long sleeve gloves, an internal tool pouch and an attached or pre-printed label. The glovebag is constructed and installed in such a manner that it surrounds the object or area to be decontaminated and contains all the asbestos fibers released during the removal process. All workers who are permitted to use the glovebag technique must be trained, experienced, and skilled in this abatement method.
47. Glovebox – A field fabricated removal box for removal of TSI on high temperature surfaces. Employs the use of a High Temperature Glovebag.
48. Grinding: To reduce to powder or small fragments and includes mechanical chipping or drilling.
49. High Temperature Glovebags: A glovebag (with the manufacturer's rating) that will withstand temperatures up to 425º F.
50. HEPA Filter: A high efficiency particulate air filter capable of removing particles greater than 0.3 microns in diameter with 99.97% efficiency using DOP testing methodology.
51. HEPA Vacuum: Vacuuming equipment with a HEPA filter system.
52. HEPA Machine: Negative air machine.
53. Holding Area: A room in the Equipment Decontamination Enclosure located between the Washroom and an uncontaminated area. The Holding Area also functions as an airlock.
54. HVAC: Heating, ventilating, and air conditioning system.
55. Isolation: The sealing of all openings into a Work Area.
56. Isolated (non-contained) Work Area: A Work Area that is Isolated, but has not been plasticized and may or may not be equipped with a Decontamination Enclosure System.
57. L&I: Washington State Department of Labor and Industries www.lni.wa.gov .
58. Leak-Tight: Solids or liquids cannot escape or spill out. It also means dust-tight.
59. Malfunction: Any sudden and unavoidable failure of air pollution control equipment or process equipment or of a process to operate in a normal or usual manner so that emissions of asbestos are increased. Failures of equipment shall not be considered

malfunctions if they are caused in any way by poor maintenance, careless operation, or any other preventable upset conditions, equipment breakdown, or process failure.

60. Manometer: An instrument used to measure the pressure difference between two areas.

61. Maximum Acceptable Level: An exposure of airborne concentrations of fibers of 0.08 fibers per cubic centimeter of air at any time. This level is a contractual standard for this Project.

62. Mini-enclosure: Typically a two-chambered enclosure consisting of a Work Area connected and contiguous to a Change Room, separated by a curtain doorway.

63. Mobilization: For purposes of this Specification and/or Project Manual a mobilization shall be considered the Contractor, its crew and equipment transported to the University of Washington Campus. A mobilization shall not be considered the moving of crew and equipment to a different part of the Work Site.

64. Moveable Object: A unit of equipment, furniture or other building component that is detached or can be detached from the building without destructive methods or results.

65. MSDS: Material Safety Data Sheet.

66. Negative Air Machine: A specially designed fan mounted in a cabinet that draws air from the contaminated space into pre-filters and a HEPA filter.

67. Negative Air Pressure System: A portable local exhaust system, equipped with HEPA filtration, capable of maintaining a constant, low velocity air flow into contaminated areas from adjacent uncontaminated areas.

68. Negative Pressure: Air pressure lower than surrounding areas, generally caused by exhausting air from within the containment work area. A sufficient volume or air shall be exhausted to create a minimum pressure of -0.02 inches of water within the enclosure with respect to the area outside of the containment work area.

69. Negative Pressure Enclosure: The negative pressure/local exhaust system, utilizing HEPA filtration capable of maintaining a negative pressure of 0.02 inches of water inside the work area and a minimum of four (4) air exchanges per hour from adjacent areas into the work area and exhausting clean, filtered air outside work area.

70. Negative Pressure Respirator: A respirator in which the air pressure inside the respirator is negative during inhalation in relation to the air pressure outside the respirator.

71. NESHAP: The National Emission Standard for Hazardous Air Pollutants (40 CFR Part 61).

72. NIOSH: The National Institute for Occupational Safety and Health, Building “J” N.E., Room 3007, Atlanta, GA 30333.

73. Non-Friable Asbestos-Containing Material: Any material containing more than 1 percent asbestos as determined using the method specified in appendix A, subpart F, 40 CFR part 763, section 1, Polarized Light Microscopy, that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

74. OSHA: The Occupational Safety and Health Administration www.osha.gov .

75. Outside Air: The air outside the building, structure, negative air enclosure, or containment.

76. Owner or Operator of a Demolition or Renovation Activity: Any person, who owns, leases, operates, controls, or supervises the facility being demolished or renovated or any

person, who owns, leases, operates, controls, or supervises the demolition or renovation operation or both.

77. PCM: Phase Contrast Microscopy.

78. PLM: Polarized Light Microscopy.

79. Penetrating Encapsulant: Liquid material applied to asbestos-containing material to control airborne fiber release by penetrating into the material and binding its components together.

80. Permissible Exposure Limit (PEL): An airborne concentration of asbestos in excess of 0.1 fibers per cubic centimeter of air as an eight (8)-hour time-weighted average (TWA).

81. Personal Monitoring: Sampling the asbestos fiber concentrations within the breathing zone of an employee during representative operations as required by applicable regulations.

82. Pipe Fitting: For purposes of this Specification and/or Project Manual, a pipe fitting is considered one lineal foot and is defined as elbow, tee, coupling, etc.

83. Plasticize: To cover floors, walls and other structural elements of a Work Area with plastic sheeting, as herein specified, and with all seams securely taped.

84. Protection Factor: The ratio of the ambient concentration of an airborne substance to the concentration of the substance inside the respirator at the breathing zone of the wearer. The protection factor is a measure of the degree of protection provided by a respirator to the wearer.

85. PSCAA: Puget Sound Clean Air Agency with jurisdiction in the counties of King, Kitsap, Pierce, and Snohomish of Washington State www.pscaa.org .

86. Regulated Area: An area established by the Contractor to demarcate areas where airborne concentrations of asbestos exceed, or can reasonably be expected to exceed the PEL. The regulated area may take the form of (a) a temporary enclosure, as required by WAC 296 62 07711, or (b) an area demarcated in any manner that minimizes the number of employees exposed to asbestos.

87. Removal: All herein-specified procedures necessary to remove Asbestos-Containing Materials from the designated areas and to dispose of these materials at an acceptable site.

88. Renovation: Altering a facility or one or more facility components in any way, including the stripping or removal of ACM or presumed ACM (PACM) from a facility component. Operations in which load-supporting structural members are wrecked or taken out are defined as demolitions.

89. Respirator: A device designed to protect the wearer from the inhalation of atmospheres containing harmful substances.

90. SDS: Safety Data Sheet

91. Shower Room: A room between the Clean Room and Equipment Room in the Worker Decontamination Enclosure with hot and cold or warm running water, and suitably arranged for complete showering during decontamination. The Shower Room also functions as an Air Lock between contaminated and clean areas.

92. Staging Area: Either the holding area or some areas near the waste transfer airlock where containerized asbestos waste has been placed prior to removal from the work area.

93. Surfactant: A chemical wetting agent added to water to reduce surface tension and improve penetration.

94. µm: Microns or micrometers.

95. Time Weighted Average (TWA): The average exposure to a contaminant in air measured during a specific time period, usually a shift, adjusted to eight hours.

96. Visible Emissions: An emission, containing particulate asbestos material that is visually detectable without the aid of instruments. This does not include condensed uncombined water vapor.

97. WAC: Washington Administrative Code as enforced by the Washington State Department of Labor and Industries, Division of Occupational Safety and Health.

98. Washroom: A room between the Work Area and the Holding Area in the Equipment Decontamination Enclosure System where equipment and waste containers are decontaminated. The Washroom also functions as an Air Lock.

99. Waste Generator: Any owner or operator of a source covered by Department of Transportation regulations whose act or process produces asbestos-containing waste material. All demolition debris materials, including ACM, except those containing substances classified as hazardous or dangerous by controlling local, state or federal regulatory agencies, shall upon their demolition became the property of the Contractor.

100. Waste Shipment Record: The shipping document, required to be originated and signed by the waste generator, used to track and substantiate the disposition of asbestos-containing waste material.

101. Wet Cleaning: The process of eliminating asbestos contamination from building surfaces and objects by using cloths, mops, or other cleaning utensils that have been dampened with amended water, and by afterwards disposing of these cleaning tools as asbestos-containing waste.

102. WISHA - Washington Industrial Safety and Health Act as enforced by the Washington State Department of Labor and Industries, Division of Occupational Safety and Health.

103. Work Area: The area where asbestos-related Work or removal operations are performed. It is isolated to prevent the spread of asbestos dust, fibers or debris and entry by unauthorized personnel.

104. Worker Decontamination Enclosure System: That portion of a Decontamination Enclosure System designed for controlled passage of workers, authorized visitors, and other personnel. Typically, it consists of a Clean Room, a Shower Room, and an Equipment Room separated from each other and from the Work area by curtained doorways.

105. WSDOT: Washington State Department of Transportation www.wsdot.wa.gov .

1.8 INDUSTRY STANDARDS

A. General Applicability of Standards: Except where Contract Documents include more stringent requirements, applicable standards of the construction industry have the same force and effect as if bound or copied directly into Contract Documents. Such standards are made a part of the Contract Documents by reference. Individual Sections indicate which codes and standards the Contractor must retain copies of at the Work Site, available for reference.

1. Referenced industry standards take precedence over standards that are not referenced, but are recognized in industry as applicable.

2. Non-referenced standards are not directly applicable to the Work, except as a general requirement of whether the Work complies with standards recognized in the construction industry.

B. Applicable standards that are recognized in the asbestos industry include, but are not limited to, the following:

1. American National Standards Institute (ANSI) www.ansi.org .

   a. Fundamentals Governing the Design and Operation of Local Exhaust Systems Publication Z9.2-2012

   b. Practices for Respiratory Protection Publication Z88.2-Edition 15

2. American Society for Testing and Materials (ASTM) www.astm.org .

   a. ASTM E1368-14, "Standard Practice for Visual Inspection of Asbestos Abatement Projects."

   b. ASTM E1494-12, "Standard Practice for Encapsulation Testing of Friable Asbestos-Containing Surfacing Materials."

3. Compressed Gas Association (CGA)

   a. Compressed Air for Human Respiration Pamphlet G-7

   b. Commodity Specification for Air Specification G-7.1

4. EPA Guidance Documents: These documents discuss asbestos abatement work or hauling and disposal of asbestos waste materials and are listed below for the Contractor's information only. These documents do not describe the work and are not a part of the work of this Contract.

   a. Guidance for Controlling Asbestos-Containing Materials in Buildings (Purple Book) EPA 560/5-85-024.

   b. Friable Asbestos-Containing Materials in Schools: Identification and Notification Rule (40 CFR Part 763).

   c. Evaluation of the EPA Asbestos-in-Schools Identification and Notification Rule. EPA 560/5-84-005.

   d. Asbestos in Buildings: Guidance for Service and Maintenance Personnel. EPA 560/5-85-018.

   e. Asbestos Waste Management Guidance. EPA 530-SW-85-007.

   f. Asbestos Fact Book. EPA Office of Public Affairs.

   g. Asbestos in Buildings. Simplified Sampling Scheme for Friable Surfacing Materials.

   h. A Guide to Respiratory Protection for the Asbestos Abatement Industry. EPA-560-OPTS-86-001.

C. Publication Dates: Except as otherwise indicated, where compliance with an industry standard is required, comply with standard in effect as of date of performance.

D. Copies of Standards: The Contract Documents require that each entity performing Work be experienced in that part of the Work being performed. Each entity is also required to be familiar

with recognized industry standards applicable to that part of the Work. Copies of applicable standards are not bound within the Contract Documents. Where copies of standards are needed for proper performance of the Work, the Contractor is required to obtain such copies directly from the publication source.

1.9 CODES AND REGULATIONS

A. General Applicability of Codes, Regulations, and Standards: Except to the extent that more explicit or more stringent requirements are written directly into the Contract Documents, all applicable codes, regulations, standards, statutes, laws, and rules have the same force and effect (and are made a part of the Contract Documents by reference) as if copied directly into the Contract Documents, or as if published copies are bound herewith.

B. Contractor Responsibility: Contractor shall be fully responsible and liable for compliance with all applicable federal, state, and local regulations pertaining to Work practices, hauling and disposal, and protection of workers, visitors to the site, and persons occupying areas adjacent to the site. Contractor shall provide medical examinations and maintain medical records of personnel as required by the applicable federal, state, and local regulations. Contractor shall hold the Owner and Environmental Consultant harmless for failure to comply with any applicable Work, hauling, disposal, safety, health or other regulation on the part of it, its employees, or its Contractors.

C. Applicable Federal requirements that govern Asbestos Abatement or hauling and disposal of asbestos or hazardous waste materials include, but are not limited to, the following:

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

    a. Occupational Exposure to Asbestos, Tremolite, Anthophyllite and Actinolite; Final Rules Title 29, Part 1910, Section 1001 and Part 1926, Section 1101 of the Code of Federal Regulations.

    b. Respiratory Protection Title 29, Part 1910, Section 134 of the Code of Federal Regulations.

    c. Construction Industry Title 29, Part 1926, of the Code of Federal Regulations.

    d. Access to Employee Exposure and Medical Records Title 29, Part 1910, Section 2 of the Code of Federal Regulations.

    e. Hazard Communication Title 29, Part 1910, Section 1200 of the Code of Federal Regulations.

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

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

    a. Regulation for 40 of the Code of Federal Regulations 763.

    b. National Emission Standard for Hazardous Air Pollutants; Asbestos, NESHAP Revision; Final Rule, 40 CFR, Part 61, of the Federal Register.

    c. Identification and Listing of Hazardous Wastes - 40 CFR 261.

    d. Resource Conservation and Recovery Act (RCRA).

    e. U.S. National Ambient Air Quality Standard - 40 CFR, Parts 50 Through 99.

    f. U.S. EPA National Pollutant Discharge Elimination System - 40 CFR 122.

    g. All Standards applicable to Generators of Hazardous Waste - 40 CFR 262.

h. All Standards applicable to Transporters of Hazardous Waste - 40 CFR 263.

i. Office of Solid Waste publication Asbestos: Waste Management Guidance (EPA/530-SW-85-007).

3. Department of Transportation (DOT) including, but not limited to:

a. Hazard Material Regulations (HMR) 49 CFR parts 171-180.

b. 49 CFR part 107, et seq., Performance-Oriented Packaging Standards; Changes of Classification, Hazard Communication, Packaging and Handling Requirements Based on UN Standards and Agency Initiative; Final Rule.

4. National Fire Protection Association (NFPA) including, but not limited to:

a. Installation of Air Conditioning and Ventilation Systems Standard 90A

5. International Fire Code, 2012 edition, including Seattle amendments

6. National Institute of Occupational Safety and Health (NIOSH) Publications including, but not limited to:

a. NIOSH 7400, Asbestos and other fibers by PCM

b. NIOSH 7402, Asbestos by TEM

D. Applicable Washington State requirements that govern Asbestos Abatement Work or hauling and disposal of asbestos or hazardous waste materials include, but are not limited to, the following:

1. Washington State Department of Labor and Industries

a. General Occupation Health Standards, Chapter 296-62 WAC and all revisions and amendments.

b. Asbestos Removal and Encapsulation, Chapter 296-65 WAC and all revisions and amendments.

c. Safety Standards for Construction Work Chapter WAC 296 155.

d. Part S, Demolition WAC 296-155-775.

e. Respirators, Chapter 296-842 WAC and all revisions and amendments.

f. Washington Industrial Safety and Health Act (WISHA) Regional Directive (WRD) 23.10 Occupational Exposure to Asbestos; WRD 23.25 Asbestos Project Notification; WRD 23.30 Asbestos-Containing Joint Compound in Wallboard Systems; WRD 23.35 Demolition of Buildings with Asbestos Containing Materials; WISHA Interim Interpretive Memorandum (WIIM) #97-7-G Mechanical Removal of Asbestos Containing Floor Tile; and WIIM #99-1-B Decertification of Asbestos Abatement Contractors and Supervisors.

g. Revisions found in WAC 296-24, 296-62, 296-65, 296-800-878, and 296-155.

2. Washington State Department of Ecology

a. WAC 173-303, Dangerous Waste Regulations, including all amendments and/or revisions.

E. Applicable Local Requirements that govern Asbestos Abatement Work or hauling and disposal of hazardous waste materials include, but are not limited to, the following:

1. Regulation III, Articles 1 and 4, General Requirements and Asbestos Control Standards, Puget Sound Clean Air Agency (PSCAA).

2. Local landfill requirements.

F. Other local regulatory agencies that have jurisdiction.

1.10 NOTICES

A. Perform all required notifications prior to beginning any Work on Asbestos-Containing Materials. The Contractor shall be responsible for sending written notifications to PSCAA and DOSH, as required by local regulations, prior to beginning any Work on Asbestos-Containing Materials.

B. The Contractor shall cooperate with Owner in providing all necessary information at least ten (10) calendar days prior to starting Abatement, to enable Owner to coordinate other Work at the University of Washington. In addition, during the Work, the Contractor is responsible to inform the Owner of Work hour changes, and start and stop days of Work. The Contractor is responsible to notify PSCAA and L&I regarding these changes and shall participate in PSCAA's online notification program.

C. Owner will perform a regulated building materials survey (which is considered an asbestos good faith inspection) to determine whether the materials to be disturbed or removed contain Asbestos. The Contractor shall not commence Work without receiving and reviewing a copy of the regulated building materials survey report.

D. The Contractor shall keep the regulated building materials survey report on Site throughout the course of the Work.

1.11 PERMITS

A. Obtain all required permits for demolition, and for transport and disposal of asbestos-containing or contaminated materials, supplies, etc.

1.12 LICENSES

A. Maintain current licenses for the Contractor and certifications for workers as required by applicable state or local jurisdictions for the removal, transportation, disposal or other regulated activity relative to the Work.

1.13 ASBESTOS ABATEMENT SUBMITTALS

A. General: Refer to the General Conditions for basic procedures concerning submittal handling.

B. Coordinate the preparation and processing of submittals with the performance of the Work.

C. Prior to each submittal, carefully review and coordinate all aspects of each item being submitted.

D. Verify that each item and the submittal for each item conforms in all respects with the specified requirements.

E. Mark each submittal with a permanent label for identification. Provide the following information on the label for proper processing and recording of action taken:
UW Project Name
UW Project No.
UW Work Order No.
Name and address of Contractor
Date
Type of Submittal
Submittal No. (if appropriate)
Statement and Signature of Abatement Subcontractor to certify coordination has been performed.

F. All submittals shall be submitted in accordance with Section 01 33 00 Submittals. All documents submitted following the initiation of the Work and prior to completion of the Work, shall be three-hole-punched for inclusion in the three-ring binder with the appropriate number of copies.

G. Identify individual submittals by name and include a table of contents in each submittal package.

H. Group all pertinent information about individual employees together and alphabetize by employee's last name.

I. Accompany each submittal with a letter of transmittal showing all information submitted for identification and quality control check.

J. Maintain an accurate Submittal Log for the duration of the Work, showing current status of all submittals at all times. Make the Submittal Log available to the Owner or Environmental Consultant for review upon request.

K. Submit "Pre-Job Submittals" to the Owner, prior to the preconstruction meeting. The Work may not proceed until the complete pre-job submittal package has been reviewed and accepted by the Owner and Environmental Consultant. Allow ten working days in schedule for review. Submit Pre-Job Submittals including:

1. A copy of all notifications (such as PSCAA and DOSH), licenses, permits, etc. For PSCAA notification, submit copy that shows it has been received and reviewed by PSCAA.

2. Detailed plan of the procedures proposed for use in complying with the requirements to include:

    a. The location and layout of decontamination areas, including a drawing showing such, the sequencing of Work, the interface of trades involved in the performance of Work, methods to be used to assure the safety of building occupants and visitors to the site, disposal plan including identity of asbestos waste hauler, location of approved disposal site, and a detailed description of the methods to be employed to control the release of asbestos fibers.

    b. Describe in detail the proposed design of the negative air pressure system, including the distance to the building air intake system, methods for closing the building's HVAC system, method of removal to prohibit visible emissions from the Work Area, and packaging of removed asbestos and lead debris. Include descriptions of all special equipment, techniques, and methods to be used during the course of the Work.

    c. Work plan shall include contingency plan for emergencies including fire, accident, power failure, negative pressure system failure, supplied air system failure, or any other event that may require modification or abridgment of decontamination or Work Area isolation procedures.

    d. Include in plan specific procedures for decontamination and Work Area isolation.

3. Copy of the Asbestos Worker Certificate issued DOSH for each employee to be utilized on the Work.

4. Copy of the completed University of Washington’s Form No. 3, “Contractor Acknowledgement of Asbestos Hazard”, contained in Appendix A.

5. Copy of the Contractor's Asbestos License certified by the Department of Labor and Industries, as applicable.

6. Names of supervisor for this project and his/her qualifications (resume showing that he/she has similar project experience and at least five years of supervisory experience), training and certificates.
7. Certification from the Contractor that all workers participate in a medical evaluation program and are approved to perform asbestos work. Copies of medical evaluations are not to be submitted.
8. Certification from the Contractor that all workers have current fit tests for the respirators to be worn for the project. Copies of fit tests are not to be submitted.
9. Proposed progress schedule for the Work.
10. Certification that the negative air pressure system to be utilized meets the requirements of the Contract Documents.
11. Sample copy of daily log form and sign in/out log to be used. The sign in/out log shall contain the following information: date, printed name and signature, entering and leaving time, company or agency represented, and reasons for entry for all persons entering the Work Area.
12. Material Safety Data Sheets/Safety Data Sheets (MSDS/SDS) for all products to be used in the course of the Work.
13. Copy of all applicable certificates/licenses for personnel and testing laboratory performing the analysis of asbestos air samples (to include samples collected for baseline/pre-abatement, personal exposure, post-abatement/clearance, outside work area, inside work area, and other asbestos air samples as applicable). Include evidence of successful participation within the PAT program for the previous two rounds or registration with the AIHA AAR Registry Program.
14. List of emergency telephone numbers (pagers, mobile phones, home telephones if possible) for the Contractor’s supervisory personnel.
15. Copy of the First Aid Certificate issued by the Red Cross for each employee to be utilized for hot/dry abatement, if necessary.

L. Submit "Job Submittals" to the Owner following the initiation of the Work. Submit Job Submittals Following Initiation of Work including:

1. Copies of the certification from DOSH or training provider for all new employees hired during the course of the Work, prior to the first day of Work on the project for each employee (for employees not included in the Pre-Job Submittal).
2. Copies of all personal air monitoring results. Submit copies to Owner and Environmental Consultant on a daily basis prior to start of next Work Shift after samples were collected.
3. Submit daily logs and sign in/out logs to Owner and Environmental Consultant daily prior to start of the next Work Shift. Faxed or email copies in PDF format are acceptable.
4. Updated progress schedule. Submit to Environmental Consultant at each weekly progress meeting.
5. Copies of the preceding week's manifests and disposal site receipts with chain of custody. Submit to Environmental Consultant at each weekly progress meeting. Receipts shall include date, quantity of material delivered, and signature of authorized representative of landfill.

M. Submit "Post-Job Submittals" to the Owner following completion of the Work. Requests for final payment will not be processed until the post-job submittal package has been reviewed and accepted by the Owner and Environmental Consultant. Submit Post-Job Submittals including:

1. Documentation of all employee personal air monitoring results relative to OSHA and DOSH respiratory protection level compliance.
2. Copies of all the Contractor's daily logs including glovebag smoke test results, sign in/out logs, and disposal/landfill site receipts with chain of custody.
3. Compile and submit the Contractor's insurance certificates, DOSH notices, and PSCAA Notice of Intent to Remove or Encapsulate Asbestos notifications. The Contractor shall also submit any amendments made to these documents during the Work.

N. Unless otherwise specified, make submittals in groups, as described herein, containing all associated items to ensure that the information is available for quality control, checking each item when it is received.

1. Partial submittals may be rejected as not complying with the provisions of the Contract. The Contractor may be held liable for delays so occasioned.

1.14 AIR MONITORING:

A. Environmental Consultant may monitor inside and outside the Work Area, as well as collect personal samples used for quality control. Note: The purpose of the Environmental Consultant air monitoring and inspection activities is to provide quality assurance only, not to replace any air monitoring and/or inspections required of the Contractor by federal, state, or local regulations or by this Section.

B. In addition to the air monitoring requirements described elsewhere in this section, the Contractor shall be responsible for all air monitoring as required by DOSH, including pre-abatement samples, personal time-weighted average and short-term excursion limit samples, post-abatement clearance sampling, and "other" sampling as required by Federal, State, or local regulations. In addition, the Contractor shall be responsible for post-abatement final inspection to determine that all required asbestos has been removed and that the area is sufficiently clean. The Owner and Environmental Consultant shall be held harmless from any legal action taken as a result of such sampling. The Contractor shall also indemnify, hold harmless, and defend the Owner, its agents, and employees for the use of any Owner supplied air-monitoring data.

C. The Contractor is required by DOSH to take his own air samples, at his own expense, per the following regulations:

1. WAC 296-62-07709 (Exposure Monitoring)
2. WAC 296-62-07735 (Appendix A)

D. The air samples must be analyzed by a laboratory in accordance with the following:

1. Personnel conducting on site asbestos air sample analysis shall be listed on AIHA's Registry of Proficiency or an equivalently recognized program and shall have successfully completed NIOSH 582 (or equivalent) training.
2. The laboratory conducting analysis of air samples shall be satisfactory participants in the NIOSH Proficiency Analytical testing (PAT) program or equivalent and shall produce their PAT number and results on request.

E. Air Monitoring Requirements:

1. Baseline/Pre-abatement Air Monitoring: Prior to beginning asbestos abatement tasks, the Contractor shall conduct air monitoring to determine the relative airborne fiber concentrations in an area during the normal functioning of that building or space.

2. Outside Work Area Air Monitoring: The Contractor shall conduct daily air monitoring to document acceptable conditions or detect faults in the work procedures and engineering controls.

3. Personal Samples: The Contractor shall conduct representative personal air monitoring in each abatement Work Area for each representative work activity as required by WAC 296-62-077. In addition to those samples required to be collected by the Contractor, the Owner or Environmental Consultant reserves the right to monitor airborne fiber levels produced by some workers to determine the effectiveness of work practices. This implies no agency relationship with the Contractor's employees.

4. Post Abatement Clearance Sampling: The Contractor shall conduct post abatement clearance sampling using PCM sample collection and analysis. The containment or regulated area shall be left in place during the clearance monitoring. The Contractor shall provide laboratory results for clearance air samples to the Environmental Consultant for review.

5. Additional Post-Abatement Clearance Sampling: the Owner reserves the right to conduct additional post abatement clearance sampling.

6. Where feasible, samples shall be collected according to the WISHA Reference Method (WAC 296 62 07735, Appendix A) and Detailed Procedure for Asbestos Sampling and Analysis (WAC 296 62 07737, Appendix B) and NIOSH Method 7400 (as revised). All samples shall be collected at a height of approximately 60 inches above the working floor for projects with 8-10 foot ceiling heights, unless otherwise directed.

F. Airborne Fiber Concentrations:

1. Inside Work Area:

a. Maintain an average airborne concentration in the Work Area of less than 0.08 fibers per cubic centimeter (f/cc) of air. If the fiber concentration rises above this figure for any sample taken, revise Work procedures to lower fiber concentration to a value below 0.08 f/cc of air.

b. If airborne fiber concentration exceeds 0.1 f/cc of air for any period of time, cease removal Work and revise Work Procedures. Do not recommence removal Work until an airborne concentration in the Work Area of less than 0.08 fibers per cubic centimeter (f/cc) of air has been achieved and revised Work Procedures have been reviewed and approved by the Environmental Consultant and Owner.

2. Outside Work Area:

a. If any air sample taken inside the outside and immediately adjacent to the Work Area exceeds 0.01 fibers per cubic centimeter, immediately stop all abatement activities, locate source of contamination, and correct any faults in the Work Area isolation or ventilation systems. Do not recommence abatement Work until corrective measures have been reviewed and approved by the Environmental Consultant and Owner.

G. Analytical Methods: The following methods will be used for analyzing filters used to collect air samples other than clearance:

1. Twenty-five millimeter (25 mm) cellulose ester filters with fifty (50) mm conductive cowl extensions will be used for all sampling. Sampling and analysis for personal samples will be conducted according to the OSHA/WISHA Reference Method. Area clearance samples will be analyzed according to the NIOSH 7400 Method using airflow rates between 1 – 10 liters per minute. At least 1,200 liters of air will be collected. All inside and outside air sampling shall be continuous throughout work shift.

2. Where used, TEM analysis will be NIOSH 7402 method.

H. Sample Volumes: Sample volumes shall be sufficient to establish the quantification limit (QL) necessary for the type of sample collected. The formulas listed in the WISHA Reference Method will be used to calculate sample volumes and/or flow rates. Sample volumes will be sufficient to collect between 100-1,300 fibers per square millimeter (f/mm2) of filter area. At a minimum, for Pre-abatement and outside samples, the QL will be 0.005 f/cc based on the EPA suggested minimum filter loading of 10 fibers in 100 fields counted. For personal samples, the QL will be 0.05 f/cc.

I. Laboratory Testing: The Contractor shall have a qualified laboratory perform analysis of the air samples required to monitor abatement procedures. The laboratory results, signed by the lab manager, shall be returned to the site prior to the start of abatement for the same work shift the following day. A complete record of inspections and all air monitoring tests and results will be furnished to the Owner's Representative and the Contractor daily.

J. Written Reports: All air monitoring test results and daily inspection logs will be posted at the job site on a daily basis.

K. The Contractor shall notify the Environmental Consultant 24 hours in advance of anticipated visual inspections and quality assurance clearance monitoring. Contractor shall allow four hours onsite for visual inspection and air monitoring by the Environmental Consultant.

L. Conflicts in air monitoring analytical results: QA/QC discrepancies identified in any of the reported analytical results will be resolved by TEM analysis (NIOSH 7402 method).

1. The Owner will not be charged for any and all costs associated with any additional sampling resulting from QA/QC air monitoring conflicts.

1.15 OBSERVATIONS

A. Environmental Consultant may observe the status and progress of the Work for completeness and general compliance with the requirements stated in the Contract Documents at the following times:

1. At designated times during the cleaning phases; and

2. As appropriate during the Work outlined elsewhere in the Contract Documents.

B. The Contractor shall notify Owner at least 48 hours in advance of the need and readiness for such observations. Owner and Environmental Consultant will make reasonable efforts to comply with time of requested observations should advance notice not be given to the Owner. Do not proceed until such observations by Environmental Consultant are performed.

C. Any delay in the completion of the Work caused by lack of advance notice given by the Contractor to the Environmental Consultant shall not be cause for any extension of time or extension of the project completion deadline.

D. Compensation for time spent by the Environmental Consultant on the Project resulting from prearranged meetings at which the Work has not progressed to the designated point shall be the responsibility of the Contractor and will be deducted from future payments due the Contractor by Owner.

1.16 ASBESTOS ABATEMENT - SPECIAL REPORTS:

A. Except as otherwise indicated, the Contractor must submit special reports directly to Environmental Consultant and others affected by occurrence within twenty-four (24) hours of occurrence requiring special report.

B. Reporting Unusual Events: When an event of unusual and significant nature occurs at site (examples: failure of negative pressure system, rupture of temporary enclosures), the Contractor must prepare and submit a special report listing chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. When such events are known or predictable, the Contractor must advise the Owner in advance at earliest possible date.

C. Reporting Accidents: The Contractor must prepare and submit reports of significant accidents, at the site and anywhere else work is in progress. Record and document data and actions; comply with industry standards. For this purpose, a significant accident is defined to include events where personal injury is sustained, or property loss of substance is sustained, or where the event posed a significant threat of loss or personal injury.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Glovebag: Provide glovebags sufficient in size to perform the Work.

B. Polyethylene Sheet: Provide flame-retardant polyethylene film that conforms to requirements set forth by the NFPA Standard 701 (Small Scale Fire Test for Retardant Textiles and Films). Provide 6-mil thick, frosted or black TRM Manufacturing Brand, or equivalent, of the largest size practicable to minimize seams.

C. Reinforced Polyethylene Sheet: Provide translucent, nylon reinforced, laminated, flame-retardant polyethylene film that conforms to requirements set forth by NFPA Standard 701. Provide 6-mil thick Permalon Brand, or equivalent, of the largest size practicable to minimize seams.

D. Duct Tape: Provide duct tape with an adhesive that is formulated to stick securely to sheet polyethylene, Nashua Brand or equivalent. Do not use polyethylene tape.

E. Spray Cement: Provide spray adhesive in aerosol cans that is specifically formulated to stick securely to sheet polyethylene, Abatement Technologies, AS-100, or equivalent. Abatement Subcontractor shall not use spray cement containing methylene chloride.

F. Lumber: Provide kiln dried fire-retardant lumber and plywood in accordance with ASTM D245.

G. Wetting materials - For wetting prior to disturbance of ACMs, use amended water, a solution of surfactant and water that results in wetting of the ACMs 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 mixed with five gallons of water. Surfactant shall consist of resin materials in water base that have been tested to ensure material is non-toxic and non-irritating to skin and eyes, and non-carcinogenic. An approved manufacturer and material is Matheson Chemical Corporation - Dust-Set Amended Water Base.

H. Sealant (encapsulant) - Provide encapsulant manufactured by reputable, established manufacturer and approved specifically for use in asbestos-contaminated environments. It is the responsibility of the Abatement Subcontractor to document compatibility of the encapsulant with replacement materials.

I. Expandable Foam Fire Stop Material: Provide UL-listed material that contains no urea formaldehyde.

J. Warning Labels and Signs: As required by 29 CFR 1926.1101 and 1994 UFC, and other pertinent state and local regulations.

K. Disposal Bags: Provide 6-mil thick leak-tight polyethylene bags affixed with three labels with text as follows:

1. First Label: Provide in accordance with WAC 296-62-07721(6), Warning labels:

DANGER
CONTAINS ASBESTOS FIBERS
MAY CAUSE CANCER
CAUSES DAMAGE TO LUNGS
DO NOT BREATHE DUST
AVOID CREATING DUST

2. Second Label: Provide in accordance with U.S. Department of Transportation regulations on hazardous waste marking (49 CFR Parts 171 and 172):

RQ ASBESTOS
NA 2212

3. Third Label: Provide permanent label for each bag listing name of Owner, date, the location where the waste was generated, and the Owner's Project Number or Work Order Number.

L. Fiberboard Drums: Provide heavy duty, leak-tight fiberboard drums with tight sealing locking metal tops, if necessary.

M. Paper Board Boxes: Provide heavy duty corrugated paper board boxes coated with plastic or wax to retard deterioration caused by exposure to moisture. Provide in sizes that will easily fit in disposal bags.

N. Other Materials: Provide all other materials, such as lumber, nails, and hardware, which may be required to construct Work Platforms, Decontamination Units and the barriers that isolate the Work Area(s).

O. Environmental Consultant and the Owner will consider equivalent products by other manufacturers for approval if submitted with appropriate information to Environmental Consultant and the Owner not later than five days prior to the scheduled time for the product to be used. Minimum information shall include Material Safety Data Sheet and application recommendations for use on ACMs.

P. Mastic Removal Solvent (if mastic remover is allowed by the Owner for this Work Order): Provide water based solvent to remove floor mastic. Provide material that is low odor, not flammable, does not create combustible vapors and has no significant inhalation hazard. Any proposed mastic remover product will require approval by the Owner and Environmental Consultant. Suggested manufacturer and product: Sentinel 909, Bean-e-doo. Owner and Environmental Consultant will consider for approval equivalent products by other manufacturers for approval. Abatement Subcontractor shall submit MSDS/SDS of the replacement mastic remover and application recommendations for use on ACMs. Submittals shall be received during Pre-Job Submittal Phase of this Work.

2.2 TOOLS AND EQUIPMENT

A. Water Sprayer: Airless or other low pressure sprayer for amended water application.

B. Negative Air Pressure Equipment: High-efficiency particulate air (HEPA) filtration systems shall have filtration equipment that complies with ANSI Z9.2-2012, local exhaust ventilation.

C. Manometer: It shall have a built-in alarm and produces a continuous hard copy readout to continuously monitor maintenance of required pressure differential between the Work Areas and outside areas.

D. HEPA Vacuums: They shall comply with ANSI Z9.2-2012.

E. Scaffolding: Provide all scaffolding, ladders and staging, etc., as necessary to accomplish the Work of this Contract. The type, erection and use of all scaffolding shall comply with all applicable DOSH and OSHA regulations. No workers shall remain on rolling scaffolding as it is being moved; the wheels shall be locked when workers are climbing the scaffolding or working from the platform.

F. Communication Equipment: It shall be suitable for inter-room communications, if required.

G. Holding Carts: Watertight wheeled carts with doors or tops that can be closed and secured.

H. Transportation: As required for loading, temporary storage, transit, and unloading of contaminated waste without exposure to persons or property. Use only enclosed or hard-covered trucks to transport waste containers to prevent loss or damage of containers in route to the landfill. Polyethylene sheeting or tarps are not considered to be hard covers.

I. Fire Extinguisher: Provide and maintain fire department certified 30-pound "ABC" fire extinguisher for each Work Area.

J. Hand tools: Provide scrapers, stiff nylon bristle hand brush and other suitable hand tools for asbestos removal.

K. General (all abatement work):

1. Full body disposable protective clothing, including head, body, and foot coverings consisting of material impenetrable by asbestos fibers (Tyvek® or equivalent) shall be provided to all workers and authorized visitors in sizes adequate to accommodate movement without tearing.

2. Fall protection equipment meeting the relevant portions of ANSI Z359, Version 3, hard hats that meet the requirements of ANSI Z89.1-2009, eye protection that meets the requirements of ANSI Z87.1-2010, and safety shoes that meet the requirements of ASTM F2412-11, shall be provided as necessary to all workers and authorized visitors and shall be sized to fit the wearer.

3. Non-skid footwear shall be provided to all abatement workers. Disposable clothing shall be adequately sealed to the footwear to prevent body contamination.

4. For mini-enclosures and glove bags, a HEPA filtered vacuum system shall be used to provide negative air.

L. Type C Respirator Systems:

1. Provide equipment capable of producing a continuous, sufficient supply of Grade D breathing air. Electrical compressor is required.

2. Compressed air systems shall be designed to provide air volumes and pressures to accommodate respirator manufacturer's specifications.

3. The compressed air systems shall have a receiver of adequate capacity to allow escape of all respirator wearers from contaminated areas in the event of compressor failure.

4. Compressors must have an in-line carbon monoxide monitor; periodic inspection of the carbon monoxide monitor must be evidenced.

5. Provide full-face piece and hose by same manufacturer that has been certified by NIOSH/MSHA as an approved Type C respirator assembly operating in pressure demand mode with a positive pressure face-piece. Maximum hose length shall be 300 feet.

M. Provide other equipment as needed to accomplish this Work.

PART 3 - EXECUTION

3.1 SEQUENCE OF WORK

A. Carry out Work of this Part sequentially. Complete each activity before proceeding to the next.

3.2 GENERAL

A. If at any time after barriers or enclosures have been erected, any visible material is observed outside of the Work Area or if damage to the barrier or enclosure occurs, work shall immediately stop, repairs shall be made and debris and residue shall immediately be cleaned up using appropriate HEPA vacuuming and wet cleaning procedures. Area air monitoring shall be started immediately in the public space to measure the asbestos concentration in the public area as a result of breaching the enclosure.

B. The Contractor must provide a minimum of two (2) phone numbers at which its supervisory personnel may be contacted on or off site at any time during the length of the Work.

C. Place all tools, staging, etc. necessary for the Work in the area to be isolated prior to erection of plastic sheeting temporary enclosure. For all full enclosures and mini-enclosures, the Contractor shall install a manometer.

D. Owner will temporarily disable ventilating systems (if required) or any other system conveying air into or out of the Work Area. The disabling of the system will be performed by disconnecting wires, removing circuit breakers, installing lockable switches or other positive means that will prevent accidental, premature restarting of equipment.

E. Contractor shall install temporary power and lighting from outside the Work Area for abatement activities. This includes replacing existing lighting inside enclosures unless it is rated for a wet location. Installation of temporary power shall be in accordance with Section 01 50 00.

F. Supervisor shall be in contact with workers at all times.

3.3 CONTROL ACCESS AND SITE SECURITY

A. Construct decontamination units as specified in this section. Permit access to the Work Area only through the decontamination unit. All other means of access shall be closed off and sealed; warning signs shall be displayed on the clean side of the sealed access. Decontamination units are required only for full enclosures. For mini-enclosures, a dry decontamination unit is required as specified in this Section and then at the end of the work day use the remote decontamination unit within the building. For non-contained regulated areas, Contractor may use remote decontamination unit set up in the building.

B. Construct temporary structural hard partitions to separate Work Areas from the remainder of the Work site, when necessary as determined by Owner's Representative and Environmental Consultant. Construct hard barriers with wood or metal studs, covered with plywood. Caulk partition at seams and other joints to form an airtight seal. Provide barrier partitions for any opening exceeding 32 square feet in area. Provide lockable door at entrance to Work Area. Provide Owner's Representative with two sets of keys to locks.

C. The Work Area is to be restricted only to authorized, trained, and protected personnel. These may include the Contractor's employees; employees of subcontractors; and Owner's employees and representatives; federal, state, and local inspectors and other authorized or designated individuals.

D. Secure the Work Area from access by occupants, staff, or users of the building. Accomplish this where possible by locking doors, windows, or other means of access to the work area, or by constructing temporary framing with plywood or gypsum board barriers. All emergency exits/corridors must be kept open.

E. Entry into the Work Area by unauthorized individuals shall be reported immediately by the Contractor to the Owner's security and the Environmental Consultant.

F. For work requiring the use of a negative pressure enclosure, a logbook shall be maintained in the clean room area of the worker decontamination system. Everyone who enters the work area must sign in, recording: name, affiliation (Contractor, Owner, regulatory agency, etc.), work phone number, purpose of entry, acknowledge existence, review and understanding of the emergency contingency plan, and time in and time out for each entry.

G. Contractor shall be responsible for site security during abatement operations.

3.4 EMERGENCY PLANNING:

A. Emergency contingency plans shall be developed by the Contractor prior to initiation of any work. These plans shall be a component of the Contractor's Health and Safety Plan.

B. Emergency procedures shall be in written form and prominently posted at the jobsite.

C. Telephone numbers of all emergency response personnel shall be prominently posted in the clean room, adjacent to the containment in the Work Area, or as directed by the Owner. To assist the Contractor, the Owner will provide a list of phone numbers for emergency response.

3.5 WORK AREA PREPARATION – FULL NEGATIVE PRESSURE ENCLOSURE (NPE) FOR REMOVING FRIABLE MATERIALS

A. Remove all uncontaminated removable equipment, fixtures, and supplies from the Work Area before commencing Work. Completely pre-clean and cover all unmovable furnishings or equipment with two layers of polyethylene sheeting, securely taped in place with duct tape. Such fixtures and equipment shall be considered outside the Work Area unless covering plastic or seal is breached. Contractor is responsible for any damage to these items while working in these areas.

B. HVAC and other systems (e.g., electrical power and steam) must be shut off to facilitate the Work. The Contractor shall follow such shutdown procedures as outlined in Section 01 50 00. If components of a HVAC system located in the Work Area cannot be shutdown, they must be sealed by using duct tape and polyethylene sheeting and then pressurized. The Owner's Representative must be informed of this so it can lock out the power supply fan, so it will not be shut off accidentally.

1. If the fan providing positive pressure fails for any reason, immediately stop asbestos removal Work and mist the area to reduce airborne fiber levels. Notify Owner's Representative and Environmental Consultant immediately. Do not re-start removal activities until authorized by Owner's Representative and Environmental Consultant.

C. Install critical barriers as follows:

1. Individually clean and seal all ventilation openings (supply and exhaust), doorways, lighting fixtures, clocks, floor drains, and all other openings into the Work Area with two layers of reinforced polyethylene sheeting, taped securely in place with duct tape or use of painters tape. Maintain seal until all Work is completed.

2. Clean and seal all lighting fixtures and HVAC diffusers with fire-stop foam, duct tape, and plastic sheeting to provide an air-tight and water-tight seal. Take care to avoid wrapping plastic sheeting on light fixtures, which may generate heat. Ensure that all electrical conduit connections and other electrical devices inside the Work Area exposed to moisture are sealed.

3. If the ACM to be removed is located below the ceiling, and if the ceiling of the Work Area is constructed of a porous material or one that could not be cleaned, the Contractor shall cover the ceiling of Work Area. The ceiling cover shall consist of one layer of polyethylene sheeting, turned down walls at least 12 inches. Form a sharp right angle bend at junction of ceiling and wall so that there are no radii that could cause the wall attachment to be pulled loose. Use spray adhesive and duct tape to seal all seams in ceiling covering.

4. Use duct tape to seal all seams of HVAC ductwork or other system components that extend through Work Area.

5. Seal all openings through the floor at columns and piping risers with a fire-stop sealant to provide an air-tight and water-tight separation between the Work Area and the floor below.

6. Ceiling systems shall be left in place if ACM to be removed is located below the ceiling. If ACM to be removed is located at or above the ceiling, the ceiling shall be left in place until after the installation of critical barriers.

D. Construct separate decontamination units in compliance with EPA, OSHA, and DOSH guidelines concerning number, size and placement of airlocks, etc. Shower in worker decontamination unit shall open into airlock on both contaminated and uncontaminated sides. Construct decontamination units of appropriate materials (including black plastic sheeting). Shower in personnel decontamination unit shall contain both hot/warm and cold running water. Supply sufficient shower units to comply with DOSH regulations. Post DOSH decontamination procedures in change room and equipment room for duration of Project. Water for the showers shall be plumbed from an Owner-designated source.

E. Trap shower waste water using filters having a maximum pore size of 5.0 microns, and drain into a sanitary sewer. Replace contaminated filters when they become clogged but not less than every third day. Dispose of filters as contaminated waste.

F. Submit the proposed exhaust route of negative air pressure to Owner's Representative and Environmental Consultant prior to initiating its use. Place Work Area under negative air pressure utilizing negative air equipment. Allow no air movement system or air filtering equipment to discharge unfiltered air outside the Work Area. Maintain a negative pressure in the Work Area continuously (24 hours per day) from the start of removal of asbestos-containing material until the area is decontaminated and certified as such by the required air clearance testing. Ensure that the air within the Work Area is changed at least once every 15 minutes, and maintain a pressure differential of at least -0.02 inches of water between the air within the Work Area and the air outside the Work Area.

G. Notify Environmental Consultant for observation and acceptance of all critical barriers, HEPA filtration systems, and decontamination units before proceeding with installation of primary barrier.

H. Install primary barrier as follows:

1. Clean all surfaces in Work Area using a HEPA filtered vacuum and by wet wiping prior to the installation of the primary barrier.

2. If ACM to be removed is not located on the floor, cover floor of Work Area with one layer of reinforced polyethylene sheeting, turned up walls at least 12 inches. Form a sharp

right angle bend at junction of floor and wall so that there is no radius that could be stepped on causing the wall attachment to be pulled loose. Use spray cement and duct tape to seal all seams in floor covering.

3. If carpeting is to remain in the Work Area, cover with two layers of polyethylene sheeting. Place corrugated cardboard sheets between layers of polyethylene sheeting. Top layer of polyethylene sheeting shall be reinforced.

4. Cover all walls in Work Area with one layer of polyethylene sheeting, mechanically supported and sealed with duct tape and spray adhesive. Seal all joints, including the junction at the floor, with duct tape.

5. The Contractor shall use the following steps when working in a restricted ceiling area:

   a. Following installation of polyethylene sheeting on floor and walls to the underside of the ceiling, remove ceiling at the perimeter, as required to gain access to the space above the ceiling.

   b. Repeat steps for the installation of critical barriers and primary barrier for areas above the ceiling. Notify Environmental Consultant for visual confirmation of the installation of the primary barrier.

6. Upon acceptance of the primary barrier by Environmental Consultant, remove remaining ceiling. The light fixtures and HVAC diffusers shall be removed, when necessary, and cleaned by wet wiping and HEPA vacuuming.

7. Upon completion of the removal of the ceiling (if required), seal all openings through the overlying deck with expandable foam fire-stop material to provide an airtight separation between the Work Area and floor above.

8. Clean and protect with one layer of polyethylene sheeting all existing undamaged non-asbestos-containing insulative coverings in the Work Areas. Remove all damaged insulative coverings and dispose of as asbestos-contaminated waste where insulation has been exposed to asbestos in removal areas.

9. Notify Environmental Consultant for visual review and acceptance of Work Area preparation before proceeding with installation of secondary barrier.

I. Install secondary barrier as follows:

1. Cover floor of Work Area with a second layer of polyethylene sheeting, turned up walls at least 12 inches. Form a sharp right angle bend at junction of floor and wall so there is no radius of sheeting that could be stepped on causing the wall attachment to be pulled loose. Locate seams at least six feet from, or at right angles to, seams in primary barrier layer. Use spray adhesive and duct tape to seal entire length of all seams in floor covering.

2. Cover all walls in Work Area with a second layer of polyethylene sheeting. Support polyethylene sheeting on wall with duct tape; seal top of secondary barrier to primary barrier with duct tape so debris cannot get behind it.

3. Install sheeting so secondary barrier can be removed independently of the primary barrier.

4. Install observation windows in locations designated by Owner's Representative and Environmental Consultant. Each observation window shall have a 24-inch x 24-inch viewing area fabricated from ¼ inch of acrylic or polycarbonate sheet. Install window with a top at 6 feet 6 inches above floor height in a manner that provides an unobstructed view of inside the Work Area. Maintain window such that the Work Area is clearly visible when looking through window.

5. Notify Environmental Consultant for visual review and acceptance of secondary barrier before proceeding with any abatement activities.

J. Maintain emergency and fire exits from the Work Areas, or establish alternative exits satisfactory to fire officials.

K. Ensure that all barriers remain effectively sealed and taped for the duration of abatement activities and subsequent cleaning. Repair damaged barriers and remedy defects immediately upon discovery. Visually inspect enclosure at the beginning of each work period. Repair damaged barriers and remedy defects immediately upon discovery.

3.6 PREPARATION OF MINI-ENCLOSURES

A. The use of mini-enclosures may be used if the removal can be completely contained by the mini-enclosure. Mini-enclosures accommodate no more than two workers per DOSH regulations.

B. Install mini-enclosures as follows:

1. Install all critical barriers.

2. Cover floor of Work Area and six feet beyond with one layer of reinforced polyethylene sheeting, at least 6 mils thick, turned up walls at least 12 inches. Form a sharp right angle bend at junction of floor and wall so that there are not unsupported radii that could be stepped on causing the wall attachment to be pulled loose. Spray-glue and duct tape all seams in floor covering.

3. Construct mini-enclosure with rigid frame below the Asbestos-Containing Materials to be abated to ensure the integrity of the enclosure when a negative pressure is applied. The enclosure shall be attached to the critical barrier or be constructed of 2" x 3" minimum wood or metal studs or PVC frame or piping and one layer of 6-mil reinforced polyethylene sheeting (forming mini-enclosure walls and ceiling). A rolling mini-enclosure is required when extensive ceiling tile cleaning is to be performed.

C. Construct dry decontamination unit as follows: Provide a change room with sufficient space for workers and storage, attached to an airlock that is attached to the Work Area. Fabricate change room and airlock in same manner as construction of mini-enclosure. Use flapped polyethylene doors at entrances and exits of change room and airlock. Post OSHA and DOSH signs at entry to change room.

D. Submit the proposed exhaust route of negative air pressure to Environmental Consultant prior to initiating its use. Place Work Area under negative air pressure utilizing negative air equipment. Allow no air movement system or air filtering equipment to discharge unfiltered air outside the Work Area. Maintain a negative pressure in the Work Area continuously (24 hours per day) from the start of removal of Asbestos-Containing Material until the area is decontaminated and certified as such by the required air testing. Ensure that air within the Work Area is exchanged at least once every 15 minutes, and maintain a pressure differential of at least -0.02 inches of water between the air within the Work Area and the air outside the Work Area.

E. Maintain emergency and fire exits from the Work Areas, or establish alternative exits satisfactory to fire officials.

F. Notify Environmental Consultant for observation and acceptance of all critical barriers, mini-enclosures, HEPA filtration systems, and decontamination units before proceeding with any disturbance of Asbestos-Containing Materials.

G. Ensure that all barriers remain effectively sealed and taped for the duration of abatement activities and subsequent cleaning. Repair damaged barriers and remedy defects immediately upon discovery

and notify Environmental Consultant. Visually inspect enclosure at the beginning of each work period. Repair damaged barriers and remedy defects immediately upon discovery.

3.7 PREPARATION OF REGULATED, NON-CONTAINED WORK AREAS (NOT WITHIN A NEGATIVE PRESSURE ENCLOSURE OR MINI-ENCLOSURE)

A. Coordinate sequence of Work Area preparation throughout the building with Owner and other trades to properly segregate Work Areas from areas that must remain fully or partially operational or in which other work is being performed.

B. Physically define areas that include Asbestos-Containing Materials to be removed. These shall be considered the Work Area.

C. Place warning signs at limits of Work Area and place drop cloths (unless removing flooring materials).

D. Clean any existing dust or debris from the floor and walls and other surfaces in the immediate location of the Work, prior to commencing Work, by damp-mopping or by use of a HEPA filtered vacuum.

E. Seal all openings, supply and exhaust vents, and convectors within the Work Area and ten feet beyond with 6-mil polyethylene sheeting secured and completely sealed with duct tape or painters tape. Have Owner disable HVAC that conveys air into or out of the Work Area.

F. When directed by the Owner's Representative or Environmental Consultant the Contractor shall seal doorways and windows with polyethylene sheeting.

G. Maintain emergency and fire exits from the Work Areas, or establish alternative exits satisfactory to fire officials.

H. Notify Environmental Consultant for observation of the preparation of Work Area before proceeding with any disturbance of Asbestos-Containing Material.

3.8 PREPARATION OF REGULATED, NON-CONTAINED WORK AREAS (NOT WITHIN A NEGATIVE PRESSURE ENCLOSURE OR MINI-ENCLOSURE) FOR OUTDOOR PROJECTS

A. If wastewater or rinsate is generated as part of the project, the requirements of Section 02 90 00, Environmental Procedures, may apply.

B. Prepare the Work Areas as a regulated, non-contained Work Area, confer with Environmental Consultant regarding appropriate placement of signs and labels, for the removal of these ACMs.

C. Housekeeping: Maintain all surfaces as free as practicable of accumulations of asbestos and perform clean-up of Work Area as necessary.

D. The Contractor shall use reinforced polyethylene sheeting drop cloths to protect the ground including but not limited to, grass areas, planted areas, concrete and asphalt, and bare soil areas that may be impacted by the work. Weight polyethylene sheeting so it does not become wind-blown. This requirement may be waived depending on removal method.

E. Install wind screens as appropriate, to reduce the chances of dust being spread.

F. Workers shall don appropriate protective gear.

G. The procedures employed by the Contractor shall not create the potential for contaminating surrounding areas or materials with asbestos. Dust generation shall be minimized at all times by employing wet methods and using HEPA shrouded equipment.

H. On a daily basis, HEPA vacuum to remove any debris and also wet-wipe to remove all dust on polyethylene sheeting.

I. Change out polyethylene sheeting as appropriate.

J. Capture and filter water runoff with use of spill pillows and socks and wet/dry HEPA vacuums. Cover storm drains with water filters as a secondary measure.

K. Contractor shall take steps to ensure that the interior of the building is not contaminated by outside work. When working adjacent to windows or doors or exterior building intakes those items shall be sealed by using duct tape and polyethylene sheeting. For exterior building intakes, prior to covering, coordinate shutdown of intakes in accordance with Section 01 50 00 "Temporary Facilities and Controls".

L. If Environmental Consultant finds dust inside the building that is attributed to exterior work, Contractor shall be responsible for clean-up, by use of wet methods and HEPA vacuums, of said dust.

M. Visible emissions will be grounds for Environmental Consultant or Owner to request that Work practices be stopped and revised.

3.9 REMOVAL OF ASBESTOS-CONTAINING FRIABLE MATERIALS

A. Prepare the Work Area as a full negative pressure enclosure (NPE) or mini-enclosure Work Area as previously specified depending on the quantity of the removal work. These procedures are also for locations where the asbestos-containing pipe fitting insulation and pipe run insulation is in a contained area and where the removal of other friable materials is being performed.

B. Remove and properly dispose of asbestos-containing materials as indicated in the Work Order in accordance with federal, state, and local regulations, or as more stringently specified herein.

C. Remove pipe run insulation and pipe fittings as follows:

1. Spray pipe run insulation and pipe fittings with a mist of amended water. Allow amended water to saturate the substrate. Remove pipe run insulation and pipe fitting in chunks and hand-place in a disposal bag. Do not drop to floor. Remove any residue on pipe or fitting with amended water and stiff nylon bristle hand brush.

2. Where pipe fitting insulation is removed from pipe with straight runs insulated with fiberglass or other non-asbestos containing insulation, remove all material within six inches of the point where it contacts the asbestos-containing insulation.

3. Wall, Ceiling and Floor Penetrations:

a. Where asbestos-containing pipe fitting insulation or pipe run insulation passes through a wall within the Work Area, remove all insulation within the wall penetration.

b. Where asbestos-containing pipe fitting insulation or pipe run insulation passes through a wall, ceiling, or floor that is a Work Area boundary, remove all insulation within the cavity. Immediately seal the penetration with expandable foam fire-stop material. Notify Environmental Consultant for visual review of the sealing and isolation of these penetrations.

D. Remove fireproofing as follows:

1. Spray asbestos-containing fireproofing with a fine mist of amended water. Allow time for amended water to saturate materials to substrate. Do not over-saturate or allow excess dripping. Scrape materials from substrate. Remove materials in manageable quantities and control the descent to staging or floor below. Spray mist surface continuously during the removal process. Remove residue remaining on substrate after scraping using stiff

nylon-bristled hand brush. If substrate dries before complete removal of residue, re-wet with amended water.

2. Wall Penetrations

   a. Where a fireproofed beam passes through a wall within the Work space, remove all fireproofing within the wall penetration.

   b. Where a fireproofed beam passes through a wall that is a Work Area boundary, remove all fireproofing to a minimum depth of three inches into the wall. Seal the wall penetration with expandable foam fire stop material. Notify Environmental Consultant for observation of the sealing and isolation of these penetrations.

3. Inaccessible Fireproofing on Perimeter Beams:

   a. Leave inaccessible fireproofing in place and seal all openings between the steel framing and the exterior wall with expandable foam fire stop material.

   b. Coordinate with Environmental Consultant and Owner's Representative to determine locations of any inaccessible asbestos-containing materials to be left in place.

   c. Install appropriate warning labels to mark the locations of any inaccessible asbestos-containing materials left in place.

E. Remove friable flooring and/or cementitious underlayment:

1. In areas where there is carpeting, remove carpeting and check for contamination. If contaminated with asbestos-containing materials, dispose of carpeting as asbestos-contaminated material. If the carpet is not contaminated, dispose of the carpeting as general construction debris.

2. Remove cove base and asbestos-containing flooring materials and cementitious underlayment using wet manual methods. Dispose of cove base and associated mastic as general construction debris if it is not asbestos-containing.

3. Remove and properly dispose of all asbestos-containing flooring materials and/or cementitious underlayment as indicated in the Work Order in accordance with federal, state, and local regulations, or as more stringently specified herein.

4. If removing cementitious underlayment, remove until only bare concrete remains.

F. Remove other friable materials as follows:

1. Spray asbestos-containing material with a fine mist of amended water. Allow time for amended water to saturate materials to substrate. Do not over-saturate or allow excess dripping. Scrape materials from substrate. Remove materials in manageable quantities and control the descent to staging or floor below. Spray mist surface continuously during the removal process. Remove residue remaining on substrate after scraping using stiff nylon-bristled hand brush. If substrate dries before complete removal of residue, re-wet with amended water. If material has wire for holding it to other components, remove wire with other materials.

G. After removal of asbestos-containing material, all surfaces shall be wet-cleaned to remove residual accumulated material. Continue wet cleaning until surface is free of visible material.

H. Place removed material in properly labeled, 6-mil disposal bags.

I. Notify Environmental Consultant for visual observation.

J. For spot removal areas where a limited amount of fireproofing will be disturbed, less than one asbestos bag, then the Work may occur in a mini-enclosure with use of glovebags. The glovebags shall be attached with spray foam.

K. For the fireproofing removed, the Contractor will use wet, manual methods. The material shall be removed until there is bare concrete or steel with no visible residual material. To remove the glovebag cut the spray foam as close as possible to the fireproofing. Then follow paragraphs F, G, and H as listed above in this Article.

3.10 REMOVAL OF ASBESTOS-CONTAINING PIPE INSULATION UTILIZING GLOVEBAG PROCEDURES IN MINI-ENCLOSURES

A. General:

1. In Work Areas where asbestos-containing pipe insulation is to be removed from piping, where no other materials are being removed, utilize glovebag procedures as specified below within a negative pressure mini-enclosure. The use of a negative pressure mini-enclosure is required for areas with critical occupancy or specific areas of concern (such as where patients or staff are present in the Health Science Center, University of Washington Medical Center, and Harborview Medical Center). The areas with critical occupancy or specific areas of concern shall be designated by the Owner's Representative and/or Environmental Consultant. If a building is unoccupied or not in area that requires the use of a mini-enclosure as designated by the Owner's Representative and/or Environmental Consultant, Contractor may prepare area as a non-contained regulated area.
2. If the use of negative pressure mini-enclosures is required, prepare the Work Area as a negative pressure mini-enclosure as previously described in Article 3.6.
3. Utilize a team of two asbestos workers to perform each glovebag activity.
4. Install glovebags according to glovebag manufacturer's recommendations.
5. The use of movable glovebags is prohibited.
6. A glovebag shall be used only once.

B. Perform glovebag procedures as follows (within mini-enclosure where required):

1. Wrap any damaged areas of pipe insulation in one layer of 6-mil polyethylene sheeting. Seal seams and ends with duct tape. Take care to avoid melting polyethylene sheeting.
2. Place one layer of duct tape around pipe insulation at points where glovebag will be attached.
3. Attach and use glovebag in accordance with manufacturer's instructions, unless more stringently specified herein.
4. Insert wand from garden sprayer through water sleeve. Duct tape water sleeve tightly around the wand to prevent leakage.
5. Use smoke tube and aspirator bulb to test seal. Gently squeeze glovebag and look for smoke leaks. Seal leaks and retest. Perform test in presence of Environmental Consultant.
6. Thoroughly wet all removed Asbestos-Containing Material within the glovebag during this entire operation.
7. Carefully cut and remove Asbestos-Containing Pipe Insulation within the glovebag. If piping penetrates walls or ceilings, seal other side (exit side) and remove Asbestos-Containing pipe fitting insulation through substrate into glovebag. Exercise care while

cutting Asbestos-Containing Materials from piping and check the immediate areas through which pipe penetrates for debris that may have fallen from wall, ceiling or floor penetration.

8. In locations where pipe fitting insulation is removed from pipes with straight runs of fiberglass or other non-asbestos containing material, remove all non-asbestos containing material within 6 inches of the point where it contacts the Asbestos-Containing Material.
9. Scrub exposed piping with a bristle or nylon brush. Remove visual accumulations of debris from piping. Allow mist to settle.
10. Seal exposed ends of pipe insulation not removed and exposed piping in glovebag with encapsulant.
11. Remove tools, through gloves or tool pouch by inverting, twisting glove, taping at twist to seal, and severing glove at midpoint of tape.
12. Collapse glovebag by inserting HEPA-vacuum. Twist bag several times at the top of bag. Tape to secure.
13. Place appropriately labeled 6-mil plastic bag around glovebag. Score glovebag above taped seal to remove from pipe and place inside 6-mil bag. Seal 6-mil bag around disassembled glovebag.
14. Seal exposed ends of pipe insulation that have not been removed and exposed piping with 100% asbestos-free bridging encapsulant.
15. Notify Environmental Consultant for visual observation.

3.11 REMOVAL OF NON-FRIABLE MATERIALS – REGULATED, NON-CONTAINED WORK AREA (NOT WITHIN A NEGATIVE PRESSURE ENCLOSURE OR MINI-ENCLOSURE)

A. Prepare the Work Area as a regulated, non-contained Work Area as previously specified (not within a negative pressure enclosure or mini-enclosure). These procedures are for locations where non-friable materials are being removed independent of other abatement work. If the non-friable materials are being removed as part of other abatement work, the Work Area shall be prepared as specified for the other materials. If mechanical means are going to be used for the removal of non-friable materials, Contractor shall perform the Work in a full enclosure as previously specified, the exception being for outdoor work. Each case of outdoor work with mechanical means will be addressed by the Owner's Representative and/or Environmental Consultant.

B. When removing materials in intact state (e.g., fire doors and sinks), the Contractor shall wet the material and remove the entire material in an intact state. The material is to be removed and wrapped in two layers of 6-mil polyethylene, labeled, and disposed of as asbestos waste. The use of a drop cloth shall be employed for these applications.

C. Remove floor tile and mastic as follows:

1. Spray floor tile and mastic with a mist of amended water.
2. Remove floor tile and mastic using manual methods and maintain material in wet condition.
3. Place removed material in properly labeled, 6-mil disposal bags.
4. Remove residual mastic by hand scrapping using razor scrappers and spud bars. The mastic shall be removed until there is no visible thickness or three-dimensional material present. Contractor shall refer to JOC Abatement Scope of Work form for specific final cleaning criteria for each Work Order. Three-dimensional mastic or residual material will be determined by using a chisel or finger nail to scrape the floor surface. If residual

mastic can be scraped by a chisel or finger nail, the work may not be considered complete.

5. If the Work Order requires drilling or sanding on residual mastic, or requires completer removal of mastic and residual mastic, the Owner may approve the use of mastic remover or other approved method, such as bead blasting, to completely remove the residual material. Visual staining is acceptable as long as no residual mastic can be scraped up using a chisel or finger nail.
6. Regarding the use of chemical mastic remover to remove residual mastic, the Owner shall determine whether the use of mastic remover is warranted and allowable, e.g. to maintain a replacement floor warranty.
7. If mastic remover is used, it shall be an Owner-approved, low odor mastic remover. The mastic remover shall be used in accordance with Owner standard operating procedures, including following the requirements of Section 01 50 00, Temporary Facilities and Controls.
8. Where mastic remover is used, the Regulated Work Area shall be properly vented to the building exterior. The ventilation system, including the exterior termination locations, shall be approved by the Owner's Representative and/or Environmental Consultant prior to mastic remover being used.
9. Care shall be taken to ensure that mastic remover does not seep into adjacent materials such as plaster and gypsum wallboard. Splash shields made of 6-mil poly shall be installed on all walls and doors, not scheduled for demolition, where mastic is to be removed. Splash shields shall extend up the walls and doors a minimum of 24 inches.
10. Care shall also be taken to ensure that mastic remover does not run into openings in the floor slab, below door thresholds, below cabinets, or penetrate to floors below or other areas outside the Regulated Work Area. A minimum amount of mastic remover shall be used in accordance with the manufacturer's recommendations.
11. The Contractor's Supervisor in conjunction with the Environmental Consultant shall inspect the floor slab prior to the use of the mastic remover. In areas where there is visible cracking, the mastic in that area shall be removed using manual methods in conjunction with hand application (through rags) of the mastic remover.
12. Ensure that no debris passes through floor cracks to the next floor below Work Area. Place all debris in 6-mil disposal bags.
13. Care shall be taken to ensure that adjacent materials such as plaster and gypsum wallboard do not become damaged.
14. If bead blasting is used to remove asbestos-containing mastic, it shall be performed in a negative pressure enclosure (NPE) as previously described.
15. After removal of ACM, wet-clean the floor surface to remove all residual debris.

D. If using a drop cloth, Contractor shall clean the drop cloth and place it in a disposal bag.

E. Notify Environmental Consultant for visual observation.

3.12 WHEN REQUIRED - HOT/DRY REMOVAL OF ASBESTOS-CONTAINING PIPE INSULATION UTILIZING HIGH-TEMPERATURE, MODIFIED GLOVEBOX PROCEDURES

A. General:

1. Follow PSCAA requirements. Do not begin dry removal work until authorized by PSCAA, Owner's Representative and Environmental Consultant. This Article is to be utilized for work where live steam or hot piping cannot be shutdown.
2. In Work Areas where Asbestos-Containing Pipe Insulation is to be removed, utilize Owner-approved high-temperature, modified glovebox and work procedures (Hot/Dry removal), as specified below within a negative pressure mini-enclosure.
3. Utilize a team of two asbestos workers to perform each glovebox activity.

B. When abating a hot pipe using this procedure, the Contractor shall ensure that the high-temperature, modified glovebox will adequately withstand the temperature by following, at a minimum, the procedures discussed below.

1. Attach the high-temperature glovebag to the pipe insulation in accordance with manufacturer's recommendation and work procedures listed below.
2. Insert PVC frame in the glovebag surrounding the hot pipe to be abated. The internal PVC frame shall form a box or rigid structure on three sides around the hot pipe in a manner that will prevent the high-temperature glovebag from collapsing onto hot, bare pipe. This set-up will be known as a high-temperature, modified glovebox.
3. Place one layer of duct tape around pipe insulation at points where glovebox will be attached.
4. HEPA filtered negative pressure equipment shall be inserted into the rigid high-temperature, modified glovebox. The high-temperature, modified glovebox shall be under negative pressure during abatement until final clearance is achieved.
5. Use smoke tube and aspirator bulb to test seal. Gently squeeze glovebox and look for smoke leaks. Seal leaks and retest. Perform test in presence of Environmental Consultant. A record of all smoke tests shall be maintained denoting the date of test, location of abatement, and the test result. A copy of the test data shall be kept on-site and be available for inspection by a representative from PSCAA.
6. Inspect bag continuously to ensure that the integrity of the high-temperature, modified glovebox is maintained.
7. When first removal is performed, carefully observe glovebox to ensure that the pipe (without insulation) will not come in contact with the glovebox.
8. Do not wet the Asbestos-Containing Material within the glovebox during this Hot/Dry operation.
9. Carefully cut and remove three linear feet of Asbestos-Containing Pipe Insulation within the glovebox. If piping penetrates walls or ceilings, seal other side (exit side) and remove Asbestos-Containing Pipe Insulation through substrate. Exercise care while cutting Asbestos-Containing Materials from piping and check the immediate areas through which pipe penetrates for debris that may have fallen from wall, ceiling or floor penetration.
10. Remove visual accumulations of debris from piping using HEPA vacuum.
11. Seal exposed ends of pipe insulation not removed, and exposed piping in glovebox with 100% asbestos-free bridging encapsulant.
12. Notify Environmental Consultant for visual observation.
13. Remove the PVC frame, tools, through gloves or tool pouch by inverting, twisting glove, taping at twist to seal, and severing glove at midpoint of tape. Thoroughly wet removed material within bag with amended water.

14. Using HEPA vacuum, collapse glovebox and twist bag several times at the top of bag. Tape to secure.

15. Tools and PVC frame inside the glovebox may be reused after following proper decontamination procedures.

16. Place appropriately labeled 6-mil plastic bag around glovebox. Score glovebox above taped seal to remove from pipe and place inside 6-mil bag. Wet material at this time. Seal 6-mil plastic bag around disassembled glovebox.

3.13 REMOVAL OF ASBESTOS-CONTAMINATED CARPETING

A. Deface carpeting with a contrasting spray paint before the work. Coat lightly enough that wetting will not be retarded.

B. Thoroughly wet asbestos-contaminated carpeting to be removed to reduce fiber dispersal into the air. Wet carpeting prior to cutting, rolling or any other activity that could disturb dust in or under the carpet. Accomplish wetting by a fine spray (mist) of amended water or encapsulant. Saturate material completely without causing excess dripping. Allow time for water or encapsulant to penetrate material thoroughly. Spray material repeatedly during the Work process to maintain a continuously wet condition. Spraying amended water or encapsulant on carpeting during cutting or rolling to minimize dispersal of asbestos fibers into the air.

C. Cut seams in the carpeting and roll up into rolls of carpeting that is no wider than 15 feet of carpeting. Roll or fold padding as necessary. Remove dust and debris from floor after removal of carpeting and padding by HEPA vacuuming followed by wet wiping.

1. Wrap the rolled carpeting in two layers of 6-mil sheet plastic. Label and dispose of in accordance with requirements of Article 3.20.

D. Notify Environmental Consultant for visual observation.

3.14 REMOVAL OF ASBESTOS-CONTAINING ROOFING MATERIALS

A. Isolate air intakes.

1. Provide Shutdown Request Form to the University to shut down air handling units that draw in fresh air from any area within 30' of the roofing work. Seal all air intakes with reinforced 6-mil sheet polyethylene. See Section 01 50 00, Temporary Facilities and Controls.

2. If air intakes cannot be shutdown, provide horizontal or vertical extension to relocate the opening of air intakes outside or above the regulated area.

B. Install critical barriers over all openings into building, adjacent buildings, or equipment within 30 feet of the Work. Do not cover building surfaces. Erect temporary screens of reinforced sheet polyethylene as required to prevent wind from carrying waste or debris from Work to any entries of building or occupied portions of the site.

C. Do not sand, abrade, or grind roofing materials.

D. Use manual methods, which do not render roofing material “non-intact.” Remove roofing materials in an intact state to the extent feasible.

E. Non-intact Built Up Roofing: Perform all removal Work on non-intact roofing when outside temperatures are warm enough that the bitumen in the roofing is above the phase change (glass) point. Carry out all roofing removal in a manner that will minimize pulverizing, breaking, or abrading involved materials.

1. Use wet methods to remove roofing materials that are non-intact, or will be rendered not intact during removal, unless wet methods are not feasible or will create safety hazards.

2. Non-intact Roof Membrane: Wet surface of roof with amended water. Use sufficient water to completely wet surface but not cause ponding or running of water. Manually cut roof membrane into sections able to fit into disposal boxes. Do not use mechanical saw. Lift sections from insulation and place in disposal boxes. Bag and dispose of as required by Article 3.19.

3. Insulation in a non-intact roof assembly: Wet insulation with amended water sufficiently to enable it to be removed in a crumbly damp mass. Remove by scraping with roofing hoes. Do not use powered roof rippers. Dispose of insulation as a non-asbestos waste, unless the insulation is contaminated with asbestos-containing roof layers. Bag and dispose of insulation contaminated with asbestos-containing roofing layers as required by Article 3.19.

4. Non-intact Vapor Barrier: Wet surface of vapor barrier with amended water. Use sufficient water to completely wet surface but not cause ponding or running of water. Scrape vapor barrier from roof deck with roofing hoes. Do not use powered roof rippers. Use water based solvent as required to completely remove vapor barrier and as much roofing bitumen as possible from roof deck. Use a HEPA vacuum or wet sweep into sweep shovels to pick up debris. Dispose of as required by Article 3.19.

F. Power Roof Cutter: When removing built-up roofs with a power roof cutter:

1. Continuously mist the blade of the cutting machine during use unless a competent person determines that misting substantially decreases worker safety.

2. Collect dust and debris resulting from the cutting operation:

a. Aggregate Surface: Collect all dust resulting from the cutting operation with a HEPA dust collector or by HEPA vacuuming along cut line.

b. Smooth Surface: Collect all dust resulting from the cutting operation with a HEPA dust collector, by HEPA vacuuming along cut line, or by gently sweeping and then carefully and completely wiping up the still-wet dust and debris left along the cut line

3. Immediately bag dust and debris resulting from the cutting operation or place in covered containers.

G. Emulsify asbestos-containing silver coat paint prior to removal.

1. Emulsifying agent shall permanently bind the asbestos-containing silver coat to the underlying substrate, such that removal operations do not render the material non-intact.

H. Do not drop or throw ACM that has been removed from a roof to the ground. Either carry or pass the ACM to the ground by hand, or lower it to the ground via covered, dust-tight chute, crane, or hoist system.

1. Intact ACM shall be removed from the roof as soon as is practicable, but in any event no later than the end of the Work shift.

2. ACM that is non-intact shall be lowered to the ground as soon as is practicable, but in any event no later than at the end of the Work shift. While the material remains on the roof, either keep it wet, placed in an impermeable waste bag, or wrapped in Polyethylene sheeting.

I. Upon being lowered, transfer unwrapped material to a closed receptacle in such manner that precludes the dispersion of dust.

J. Dispose of all friable materials in accordance with the requirements stated in Article 3.19. Dispose of non-friable waste in accordance with state and local regulations.

K. Notify Environmental Consultant for visual observation.

3.15 WRAPPING PIPE TO BE DEMOLISHED WITH POLYETHYLENE SHEETING, "WRAP AND CUT METHOD"; IN REGULATED, NON-CONTAINED WORK AREAS (NOT WITHIN A NEGATIVE PRESSURE ENCLOSURE OR MINI-ENCLOSURE)

A. Piping lines scheduled to be demolished that are insulated with Asbestos-Containing Materials may be wrapped with polyethylene sheeting prior to severing the system at the cut-point, as directed in the Work Order.

B. Contractor shall verify that the piping to be removed is no longer in use and has been drained of liquids or gases and isolated from live systems prior to proceeding with work.

C. Prepare Work Area as a regulated, non-contained Work Area (not within a negative pressure enclosure or mini-enclosure).

D. Wrap piping as follows:

1. Spray piping with a mist of amended water.

2. Wrap and seal materials with two layers of 6-mil polyethylene sheeting or two layers of tubular 6-mil polyethylene sleeves.

3. Perform glovebag abatement of Asbestos-Containing Pipe Insulation according to Article 3.10 at proposed cut point. Remove approximately twelve inches of insulation to create enough space for severing the bare pipe without disturbing Asbestos-Containing Insulation. Seal all exposed ends with 100% asbestos-free bridging encapsulant.

E. Dispose all debris as asbestos-containing and asbestos-contaminated waste.

F. Notify Environmental Consultant for visual observation.

3.16 CEILING TILE AND CEILING PLENUM CLEANING

A. Properly clean ceiling tiles, mechanical and other equipment in the ceiling plenum, and cable tray, as indicated in Work Order in accordance with federal, state, and local regulations, or as more stringently specified herein. The Work described in this Article is for areas that are restricted by the Owner. Contractor shall use these procedures in conjunction with the University of Washington's Owner's Restricted Access Program.

B. Prepare Work Area as a mini-enclosure. Access above ceiling grid from within the mini-enclosure.

C. Clean ceiling tile and ceiling plenum as follows:

1. Using HEPA vacuum clean edges of tiles to be removed.

2. Clean the top surface of the ceiling tile and grids, and cable trays that are within reach of worker.

3. Wet wipe all other surfaces (e.g. HVAC, plumbing systems, and other ceiling fixtures in the ceiling plenum). Remove all visible debris in the Work Area from the ceiling plenum. Take care not to disturb Asbestos-Containing Materials.

4. Maintain HEPA vacuum in continuous operation.

5. Dispose all material used for the cleaning procedure as asbestos-contaminated waste.

6. Notify Environmental Consultant for visual observation and clearance.

D. Upon passing visual observation and clearance, and if required by Work Order, re-install ceiling tiles.

E. The Contractor shall label (tag) cleaned ceiling tiles. Labels (tags) shall be placed on underside of ceiling tile and be visible from below.

F. The label (tag) shall contain the following information:

Contractor's Name
Supervisor's Name
UW Work Order Number
Date of cleaning

G. The label (tag) shall be placed in the center of the ceiling tile.

H. The label (tag) shall be attached with use of flat thumb tacks.

3.17 CLEAN UP OF ASBESTOS-CONTAINING DEBRIS

A. Work of this Article is limited to the cleanup of a small quantity of amassed debris that has fallen from an architectural finish, fireproofing, or thermal insulation on pipes, boilers, and other equipment, or debris from damaged floor coverings (e.g. vinyl floor tile and vinyl floor sheeting).

B. Remove asbestos-containing debris and decontaminate the area involved using the following sequence:

1. Shut down all ventilation directed into area.
2. Wet the debris.
3. Seal entry to Work Area with 6-mil polyethylene. Slit polyethylene for entry. Install a flap to cover the slit automatically; tape slit closed after entry.
4. Start HEPA vacuum or HEPA filtered fan unit before entering the area.
5. Use the HEPA vacuum to clean a path at least 6 feet wide from the entry point of the Work Area to the site of the fallen material.
6. Remove all small debris with the HEPA vacuum.
7. Pick up large pieces of debris and place in the bottom of a disposal bag. Place pieces in the bag without dropping, avoiding unnecessary disturbance and release of material. Wet contents of bag.
8. Remove all remaining visible debris with HEPA vacuum.
9. HEPA vacuum, in two directions each at right angles to the other, an area 3 feet beyond the location that visible debris was found.
10. Place a polyethylene drop cloth immediately on top of the HEPA vacuumed area before performing any repair work on site from which fall-out occurred.
11. HEPA vacuum the site from which material fell, removing all loose material that can be removed by the vacuum's suction.
12. Repair or remove remaining material.
13. HEPA vacuum ladder and/or any tools used and pass out of the Work Area.

14. HEPA vacuum all surfaces in the room that may have been contaminated, starting at the top of wall and working downward to the floor. Then start at corner of floor farthest from entrance to Work Area and proceed towards entrance.

15. HEPA vacuum the floor using a floor attachment with rubber floor seals and adjustable floor to attachment height. Adjust the height so that the rubber seals just touch the floor if carpeted and are within 1/16 inch of hard surface floors. Vacuum the floor in parallel passes with each pass overlapping the previous by one-half the width of the floor attachment. At the completion of one cleaning, vacuum the floor a second time at right angles to the first.

C. If there are objects in the Work Area, perform the following:

1. Decontaminate objects wherever possible on a plastic drop sheet.

2. HEPA vacuum all surfaces of object and immediate area before moving the object.

3. Pick-up object, if possible, and HEPA vacuum all surfaces.

4. Hand to off-sheet worker who will wet-clean object, if possible, and place in storage location.

5. Decontaminate area where object was located by HEPA vacuuming twice, in perpendicular directions. Wet clean if necessary to remove any debris.

6. Return object to its original location.

D. Notify Environmental Consultant for visual observation and clearance.

3.18 CLEAN UP AND WORK AREA CLEARANCE:

A. Provide general cleanup of Work Areas concurrent with the removal of all ACMs. Do not permit accumulation of debris on Work Area floor.

1. Clean all surfaces of the Work Area including polyethylene sheeting, tools, scaffolding and/or staging by use of damp-cleaning methods, and HEPA vacuums. Do not perform dry dusting or dry sweeping. Continue this cleaning until there is no visible debris from removed materials or residue on polyethylene sheeting or other surfaces.

2. Clean all sealed impermeable containers and all equipment and remove from Work Area, via the equipment decontamination enclosure system if within a negative pressure enclosure.

3. If used, allow negative air machines to continue running until clearance process is complete. In negative pressure enclosures, maintain negative air pressure in the Work Area until the clearance process is complete.

B. The abatement work is complete when the work area is visually clean and airborne fiber levels have been reduced to the level specified below.

1. The Contractor will conduct a final visual inspection of the Work Area for completeness of work and the presence of any visible debris following all abatement per ASTM E1368-14, “Standard Practice for Visual Inspection of Asbestos Abatement Projects.” Following the Contractors successful visual inspection the work area must pass the following visual inspection process.

a. The Environmental Consultant will perform a visual inspection of the work area and note deficiencies.

b. If deficiencies are noted, the Environmental Consultant shall create a punch list and forward to the Contractor. Contractor shall resolve all punch list items.

c. If the Contractor fails the visual inspection after a punch list has been created, all future visual inspection costs will be borne solely by the Contractor. The Owner will not be charged for the cleanup time, materials, air monitoring costs, or delay costs.

d. Once the Environmental Consultant gives the final visual clearance, the Environmental Consultant will provide the Contractor with signed clearance forms.

e. Upon receipt of signed visual clearance forms, the Contractor shall apply a lockdown type asbestos encapsulant to surfaces on which asbestos has been removed.

1) In cases when negative pressure enclosures have been used, maintain operation of negative air system during the encapsulation process.
2) Mix ratio of encapsulant shall be per manufacturer's recommendations.
3) Apply encapsulant with airless sprayer onto substrate.
4) Allow encapsulant to dry for a minimum of eight (8) hours or until surfaces are dry before conducting any air clearance sampling.

2. In each Work Area after completion of all visual inspections, cleaning work, and application and drying of lock-down encapsulant, the Contractor shall collect a minimum of one (1) sample and one (1) lab blank at a flow rate of 1 to 10 liters per minute to give a fiber density of between 100 to 1,300 fibers/mm2 on the filter and analyzed as follows:

a. Analysis: Fibers on each filter will be measured using the NIOSH 7400 procedures. At least 1,200 liters of air will be collected.

b. Release Criteria: Decontamination of the Work Area is complete when every clearance sample is equal to or less than 0.01 fibers/cc or less than pre-abatement levels, whichever is lower. If any sample exceeds 0.01 fibers/cc or the pre-abatement levels, then the decontamination is incomplete and re-cleaning is required.

c. The services of a testing laboratory will be employed by the Contractor to perform laboratory analysis of the air samples. Verbal laboratory results will be available within eight (8) hours of taking clearance samples. A complete record of all air monitoring tests (with final results) and inspections will be furnished to the Environmental Consultant via the Contractor within 24 hours of sample collection.

3. Additional to Contractor's Air Sampling Clearance: Following the successful visual inspections, the Environmental Consultant may conduct quality assurance clearance air sampling.

a. TEM sampling and analysis, if necessary, will be performed using the NIOSH 7402 method.

b. Areas will be considered clear when every clearance sample is equal or less than 0.01 fibers/cc or less than pre-abatement levels, whichever is lower. If any sample exceeds 0.01 fibers/cc or the pre-abatement levels, then the decontamination is incomplete and re-cleaning is required.

c. If the abatement area fails the final clearance air sampling, the Contractor shall re-clean the area. After re-cleaning, the final air clearance sampling shall be conducted again. Costs associated with re-cleaning and additional air sampling will be borne solely by the Contractor. The Owner will not be charged for the cleanup time, materials, air monitoring costs, or delay costs. Delays resulting from non-compliant visual inspections will not constitute an extension to the project time.

4. Once the Work Areas have cleared the final air clearance, the Environmental Consultant shall provide the Contractor with signed Certificate of Clearance form (sample attached to the end of this Section).

C. Upon notification from Environmental Consultant that final clearance is granted, dismantle Decontamination Enclosure System. Thoroughly HEPA-vacuum and wet clean immediate areas and remove all critical barriers.

D. Dispose of debris resulting from removal operation, used cleaning materials, unsalvageable materials used for sturdy barriers, and any other remaining materials. Consider the materials to be contaminated and dispose of them accordingly.

3.19 PROCEDURES FOR EMERGENCY SPILLS AND UNCONTROLLED RELEASES OF ASBESTOS OR PACM

A. This procedure shall be used in any situation involving an uncontrolled release of ACM or PACM such as, but not limited to, dislodging of asbestos materials by accident, a rupture in a containment, breaking of a glove bag, tearing open of previously wrapped material, spills of drums for disposal, the use of asbestos contaminated clothing, tools or equipment in an unregulated area, or similar event where ACM or PACM may be or has the potential to be introduced into the air in an uncontrolled manner.

B. Specific Work Procedure:

1. Evacuate the immediate area of all unprotected personnel.

2. Establish a regulated Work Area. The Work Area shall be identified and access restricted in any manner that minimizes the number of persons within the Work Area and protects persons outside the work area from exposure above the action level in accordance with WAC 296 0771. Seal all openings into Work Area including drains.

3. Use caution to assure personnel are not tracking asbestos-containing debris to areas outside the regulated area and spreading the contamination.

4. Wet down, encapsulate, and pick up large chunks and place in a properly labeled asbestos disposal bag. Asbestos disposal bags shall meet the requirements of WAC 296 62 07721.

5. Vacuum the entire area using a HEPA equipped vacuum.

6. Wet wipe the entire contaminated area with clean wet rags and/or mops.

7. Encapsulate all surfaces within the Work Area. Protect equipment, furnishings, and other items in work area during encapsulation.

8. The clean-up procedures shall include the entire affected area.

9. Provide the Owner’s representative and Environmental Consultant with a detailed written report of the causes of the accident, the Contractor’s response, the results of actions taken, and steps to be implemented to avoid future occurrences within 24 hours of the spill.

10. All work performed under this procedure shall be undertaken by Certified Asbestos Workers in protective clothing with half face respirators as a minimum, under the supervision of a Certified Asbestos Supervisor.

3.20 DISPOSAL OF WASTE

A. Double-bag all adequately wet asbestos-containing waste and contaminated debris: bags shall not be over-filled and shall be securely sealed to prevent accidental opening or leakage. Bags shall be

placed in fiberboard drums for transportation to the landfill if sharp objects are included in the asbestos-containing waste. Mark each container with permanent labels as listed in Article 2.1K.

B. Remove bagged or drummed materials from buildings on a daily basis. Coordinate with Owner's Representative to schedule after-hours removal of materials from buildings. Contractor is responsible for protecting interior finishes along designated route of transport through buildings. Enclosed carts shall be utilized for transport of materials through Owner's Buildings.

C. Do not store containerized waste outside of the Work Areas. Containerized materials can be stored for no more than eight hours within the Work Areas. Take containers from the Work Areas directly to Transportation. Carefully load waste into Transportation. Exercise care before and during transport, to ensure that no unauthorized persons have access to the material.

D. Shower water, if used, shall be drained, collected, and filtered through a system with at least a 5.0-micron particle size collection capability.

E. All demolition debris materials, including asbestos-containing materials, except those containing substances classified as hazardous or dangerous by controlling local, state, or federal regulatory agencies, shall upon their demolition become the property of the Contractor. All such material, including those containing hazardous or dangerous substances, shall be removed and properly disposed of away from the site and on property not owned by the Owner.

F. Transportation to the Landfill:

1. All transportation of asbestos containing waste material shall adhere to federal, state, and local regulations, including, but not limited to:

   a. Hazard material regulation 48 CFR parts 171.180.

   b. 49 CFR part 107.

2. Once drums, bags, and wrapped components have been removed from the work areas, they shall be loaded into an enclosed or covered truck for transportation.

3. Containers shall not be dragged, dropped, or thrown.

4. Personnel transferring or loading asbestos containing waste shall be protected by disposable clothing (including head, body; and foot protection) and, at a minimum, half face respirators using HEPA filters.

5. Any debris or residue observed on containers or surfaces outside the work area shall be immediately cleaned up using HEPA filtered vacuum equipment, or wet methods.

6. Large metal dumpsters are sometimes used for asbestos waste disposal. These shall have doors or tops that can be closed and locked to prevent vandalism or other disturbances. Containers shall be placed, not thrown, into these containers to avoid rupture.

7. Asbestos-containing or-contaminated wastes shall be segregated and transferred separately from non-asbestos wastes.

G. Waste shipment, waste manifest, and disposal records shall be delivered to the Owner within forty-five (45) days of completion of the abatement work. This information shall document the pickup site and disposal site, the quantity of the asbestos waste and the type of containers used. The Contractor and the Disposal Site Operator shall sign waste manifest. If a separate hauler is employed, their name, address, telephone number and signature shall also appear on the manifest.

H. Waste shall be disposed only at UW audited and approved facilities, which can be found at the following location: https://www.ehs.washington.edu/epowaste/disposalfaclist.pdf

1. Upon reaching the landfill, trucks are to approach the dump location as closely as possible for unloading of the asbestos-containing waste.

2. Personnel off-loading containers at the disposal site shall wear protective equipment consisting of disposable head, body, and foot protection, and at a minimum, half-face piece, air-purifying respirators equipped with high-efficiency filters.
3. Bags, drums, and components may be inspected, as they are off-loaded at the disposal site. Material in damaged containers shall be repacked in empty drums or bags as necessary.
4. Waste containers shall be placed on the ground at the disposal site, not pushed, thrown or dumped out of trucks.
5. Following the removal of all containerized waste, the truck cargo shall be decontaminated using HEPA vacuums or wet methods to meet the no visible residue criteria. Polyethylene sheeting shall be removed and discarded along with contaminated cleaning materials and protective clothing in bags or drums at the disposal site.

END OF SECTION