DIVISION 02 – EXISTING CONDITIONS
02 80 00 FACILITY REMEDIATION
02 82 13 ASBESTOS ABATEMENT

PART 1 - GENERAL

1.01 RELATED WSU DESIGN AND CONSTRUCTION STANDARDS

A. WSU Design Standard 02 40 00 Demolition and Structure Moving

1.02 SCOPE OF WORK

A. Description of Work: The asbestos abatement work of this project includes the removal and proper disposal of asbestos-containing materials in preparation for renovation/demolition as described elsewhere in the technical specifications.

B. Materials include: [Note to Design Consultant: Modify the text below to reflect Scope of Work]

1. Removal and disposal of friable asbestos-containing sheet vinyl flooring materials;

2. Removal and disposal of friable asbestos-containing mudded/plaster pipe fitting insulation present on heat and domestic water piping;

3. Removal and disposal of friable asbestos-containing boiler system tank insulation;

4. Removal and disposal of friable asbestos-containing popcorn ceiling texture;

5. Removal and disposal of orange peel wall texture on gypsum wallboard/joint compound system which contains less than 1% asbestos.

C. WSU Environmental Health and Safety (EH&S) shall provide Good Faith Asbestos Survey documentation, including analytical data and addendum(s) as appropriate.

1.03 REQUIREMENTS

A. Description of Requirements: Paragraph 1.03 identifies selected governmental regulations and industry standards that are included and incorporated herein by reference and made a part of the specification. This paragraph also sets forth those notices and permits which are known to the Owner and which both must be applied for and received or which shall be given to governmental agencies before start of work.

1. Requirements include adherence to work practices and procedures set forth in applicable codes, regulations and standards.

2. Requirements include obtaining permits, licenses, inspections, releases, and similar documentation, as well as payments, statements and similar requirements associated with codes, standards and regulations.

3. The requirements of WSU Design Standard 02051 are intended to facilitate communication regarding project specific application of common statutory requirements and industry practices. Nothing in WSU Design Standard 02051 shall be interpreted to imply, by omission or conflict, that specific regulatory requirement(s) are not applicable.

B. Safety and Health Compliance

1. Medical Requirements: Those medical regulations as specified in Washington Administrative Code (WAC) 296-62-077 shall be followed.

   i. Medical Examinations: Before exposure to airborne asbestos fibers, provide workers with a comprehensive medical examination as required by WAC 296-62-077 or other pertinent state or local directives. This requirement must have been satisfied within the past year. The same medical examination shall be given on an annual basis to employees engaged in an occupation involving asbestos and within 30 calendar days before or after the termination of employment in such occupation. Specifically identify x-ray films of asbestos workers to the consulting radiologist and mark medical record jackets with the word "ASBESTOS."

   ii. Medical Records: Maintain complete and accurate records of employees' medical examinations, medical records, and exposure data for a period of at least 30 years after termination of employment. Records of the required medical examinations and exposure data shall be made available for inspection and copying to the Director of the Washington State Department of Labor and Industries or authorized Consultants of the agency and an employee's physician upon the request of the employee or former employee. This requirement is consistent with the current applicable standard, WAC 296-62-07727(5), and may be modified to comply with applicable standards at the time of the request for production of such records by authorized individuals. Federal agencies such as, but not limited to, the US Department of Labor and/or the National Institute of Occupational Safety and Health may also make such requests and similar access to records shall be provided.

2. Respiratory Protection Program: Establish and implement a respirator program as required by WAC 296-842 and WAC 296-62-07715.

    i. Instruct and train each worker involved in the removal of asbestos containing materials in proper respirator use and require that each worker continuously wears a respirator, properly fitted on the face, while in the work area.

    ii. The appropriate level of respiratory protection must be provided based on the fiber concentrations encountered in the work place or as required for other toxic or oxygen-deficient situations encountered. It shall be the responsibility of the contractor to provide the appropriate level of respiratory protection.

    iii. Respiratory protection shall be utilized for all asbestos-containing material removal outlined in this specification. Workers shall wear respiratory protection at all times while they are inside the designated work areas performing removal of Class 1 asbestos-containing materials. Respirators must be used in areas in which Class 2 work is performed until such time as personal sampling demonstrates to the satisfaction of the Owner that Contractor employees will not be exposed above Permissible Exposure Limits (PELs). Respirators used must be of a type and model approved by the National Institute of Occupational Safety and Health (NIOSH). Respirators chosen shall be suitable for the potential asbestos exposure level in the work, per WAC 296-842-13005. Individuals are to use only those respirators for which training and fit testing have been provided.

    iv. Provide sufficient replacement filters as necessary for the workers.

    v. No visitors, except for WSU or governmental inspectors having jurisdiction, should be permitted in the work areas after commencement of asbestos abatement. However, when personnel do require access to the work areas for a specific purpose, and are approved by the competent asbestos abatement project supervisor, such individual(s) shall be provided with, trained and required to wear the respiratory protection required for other workers in the area.

    vi. Provide documentation of worker training in Pre-Job Submittals as specified in paragraph 1.06 B. Instruct and train each worker involved in the removal of asbestos-containing material included in the scope of work and insure that each worker continuously wears a respirator, medically cleared and properly fitted on the face, while in the work area.

3. Hazard Communication: Adhere to all parts of WAC 296-800-170 and WAC 296-901-140 and provide the Owner with a copy of the Safety Data Sheets (SDS) for all materials brought to the site.

C. Training: The employees utilized during the abatement project must be trained in accordance with the regulations stated in WAC 296-62-077 and WAC 296-65. Specifically in the State of Washington, each employee must have completed a Washington State approved Certified Asbestos Worker Course (WAC 296-65-010), and supervisors must have completed a Washington State approved Certified Asbestos Supervisor Course (WAC 296-65-012). The duties and responsibilities of the worker/supervisor, which shall be outlined in the certification course, will reflect the regulations set forth in the Washington Asbestos Standard (WAC 296-62-077). Following certification, each employee shall be instructed annually for a minimum of 8 hours in a Washington State Asbestos Worker/Supervisor Refresher course in order to maintain their certification. Courses shall address the hazards of asbestos, safety and health precautions; the use and requirements for protective clothing, equipment and respirators; the association of cigarette smoking and asbestos-related disease and all additional requirements of WAC 296-62-077. Each employee must be medically cleared to use a selected respirator and furnished with a respirator fit test as required by WAC 296-62-077. Engineering and other hazard control techniques and procedures should be covered. The Contractor shall document the training by providing: dates of training, training entity, course outline, names of instructors and qualifications of instructors upon request by the Owner.

D. Permits, Licenses, and Notifications: Washington State Department of Ecology (Ecology) and Washington State Department of Labor and Industries (L&I) notification forms must be filed at least 10 working days in advance of commencement of any asbestos project. Contractor shall not start work until receipt of acknowledgment from the applicable governmental agency. The Contractor will pay the cost of necessary notifications, permits and licenses.

1. Notices: Perform all required notifications prior to beginning any work on asbestos-containing materials. Submit copies of Ecology and L&I notification forms, including any addendums, to Washington State University (WSU) Environmental Health and Safety (EHS) concurrent with submittal to Ecology and L&I.

2. Permits: Obtain and pay for all required permits for demolition, for construction and for transport and disposal of asbestos-containing materials, supplies, etc.

3. Licenses: Maintain current licenses for Contractor and certifications for workers as required by applicable state or local jurisdictions for the

removal, transporting, disposal or other regulated activity relative to the work of this contract.

E. Codes and Regulations

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

2. Contractor Responsibility: The Contractor shall assume full responsibility and liability for the compliance with all applicable federal, state and local regulations pertaining to work practices, hauling, disposal and protection of workers, visitors to the site and persons occupying areas adjacent to the site.

3. The Contractor shall hold the Owner and Owner's Representatives harmless for failure to comply with any work requirements stated herein, hauling, disposal, safety, health or other regulation on the part of him/herself, his employees or his subcontractors.

4. Federal Requirements which govern asbestos abatement work or hauling and disposal of asbestos waste materials include, but are not limited to, the following:

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

      1) Occupational Safety and Health Standards (29 CFR 1910)
      2) Safety and Health Regulations for Construction (29 CFR 1926)

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

      1) National Emission Standards of Hazardous Air Pollutants (NESHAP) (40 CFR 61, Sub-parts A and M)
      2) Identification and Listing of Hazardous Wastes (40 CFR 261)

   iii. U.S. Department of Transportation (DOT) including but not limited to:

      1) Hazardous Materials Regulations (49 CFR 171 and 172)

5. Washington State requirements which govern asbestos abatement work or hauling and disposal of asbestos waste materials include but are not limited to, the following:

    i. Washington State Department of Labor and Industries:

        1) General Occupation Health Standards Chapter 296-62-077 and all amendments of the WAC.
        2) Asbestos Removal and Encapsulation Chapter 296-65 and all amendments of the WAC
        3) Safety Standards for Construction Work Chapter 296-155 and all amendments of the WAC

    ii. Washington State Department of Ecology:

        1) Dangerous Waste Regulations, Chapter 173-303

6. Local Requirements: which govern asbestos abatement work or hauling and disposal of asbestos waste materials include, but are not limited to, the following:

    i. Whitman County Health Department requirements of solid waste landfills.

1.04 REFERENCES

A. The publications listed in paragraph 1.04 form a part of this technical specification by reference. The current versions of the referenced documents apply at all times, even when changes occur after bid and award of contract. The publications are referred to in the text by the basic designation only. The documents referenced herein are to be regarded as informational only for the guidance and clarification of industry accepted work practices and procedures. The inclusion or omission of a specific standard or document does not relieve the contractor from responsibility and requirements for performing the work in strict compliance with applicable codes, standards, and regulations, as well as, generally accepted industry practices.

B. Regulatory requirements listed in paragraph 1.04 apply to asbestos abatement related operations in addition to requirements that are identified in asbestos-specific regulations.

C. All work shall be done in compliance with the publications listed in paragraph 1.04 as well as the current Washington State University referenced version of the International Building Code, Uniform Plumbing Code, the National Electrical Code and as specified herein.

D. Federal, state and local regulations are continuously being developed and enacted. The Contractor is required to have current knowledge of regulations applicable to asbestos abatement and shall conduct asbestos removal and disposal operations in compliance with regulations whether or not they are referenced herein.

E. AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

1. ANSI Z9.2 - Fundamentals Governing the Design and Operation of Local Exhaust Systems
2. ANSI Z88.10 - Respirator Fit Test Methods
3. ANSI Z88.7 - Color Coding of Air Purifying Respirators Canisters, Cartridges and Filters

F. AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

1. ASTM C 732 - Aging Effects of Artificial Weathering on Latex Sealants
2. ASTM D 522 - Mandrel Bend Test of Attached Organic Coatings
3. ASTM D 1331 - Surface and Interfacial Tension of Solutions of Surface-Active Agents
4. ASTM D 2794 - Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)
5. ASTM E 84 - Surface Burning Characteristics of Building Materials
6. ASTM E 96 - Water Vapor Transmission of Materials
7. ASTM E 119 - Fire Tests of Building Construction and Materials
8. ASTM E 736 - Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members

G. US DEPARTMENT OF LABOR, OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) Code of Federal Regulations (CFR)

1. 29 CFR 1910.134 - Respiratory Protection
2. 29 CFR 1910.141 - Sanitation
3. 29 CFR 1910.145 - Accident Prevention Signs and Tags

4. 29 CFR 1910.1200 - Hazard Communication

5. 29 CFR 1926.1101 - Asbestos

H. ENVIRONMENTAL PROTECTION AGENCY (EPA)

1. 40 CFR 61-SUBPART M - National Emission Standard for Asbestos

2. 40 CFR 763-SUBPART E - Friable Asbestos-Containing Materials in Schools

3. 49 CFR Part 178 - Specifications for Packagings

4. EPA 560/5-85-024 - Guidance for Controlling Asbestos Containing Materials in Buildings

I. STATE OF WASHINGTON DEPARTMENT OF LABOR AND INDUSTRIES
DIVISION OF LABOR STANDARDS AND SAFETY
CHAPTER 296-24 WAC GENERAL SAFETY AND HEALTH STANDARDS

1. Sub-Section - 37007 Ventilation

J. STATE OF WASHINGTON DEPARTMENT OF LABOR AND INDUSTRIES
DIVISION OF LABOR STANDARDS AND SAFETY
CHAPTER 296-62 WAC OCCUPATIONAL HEALTH STANDARDS

1. Sub-Section - 020 Definitions

2. Sub-Section - 060 Control Requirements

3. Sub-Section - 077 Asbestos, Tremolite, Anthophyllite and Actinolite

K. STATE OF WASHINGTON DEPARTMENT OF LABOR AND INDUSTRIES
DIVISION OF INDUSTRIAL SAFETY AND HEALTH
CHAPTER 296-65 WAC ASBESTOS REMOVAL AND ENCAPSULATION

1. Sub-Section - 001 Purpose and Scope

2. Sub-Section - 003 Definitions

3. Sub-Section - 005 Asbestos Worker Training Course Content

4. Sub-Section - 007 Asbestos Supervision Training Course Content

5. Sub-Section - 010 Asbestos Worker Certification

6. Sub-Section - 012 Asbestos Supervision Certification
7. Sub-Section - 015 Training Course Certification
8. Sub-Section - 020 Notification Requirements
9. Sub-Section - 030 Methods of Compliance

L. STATE OF WASHINGTON, DEPARTMENT OF LABOR AND INDUSTRIES
DIVISION OF INDUSTRIAL SAFETY AND HEALTH
CHAPTER 296-155 WAC SAFETY STANDARDS FOR CONSTRUCTION WORK

1. Part A WAC 296-155-001 through 296-155-*040 General Safety and Health Provisions*
2. Part B-1 WAC 296-155-100 through 296-155-17654 *Occupational Health and Environmental Control*
3. Part B-1 WAC 296-155-176 *Lead*
4. Part C WAC 296-155-200 through 296-155-240 *Personal Protective and Life Saving Equipment*
5. Part C-1 WAC 296-155-245 through 296-155-24525 *Fall Restraint and Fall Arrest*
6. Part D WAC 296-155-250 through 296-155-280 *Fire Protection and Prevention*
7. Part E WAC 296-155-305 through 296-155-315 *Signaling and Flaggers*.
8. Part F WAC 296-155-325 through 296-155-34920 *Material Handling, Storage, Use and Disposal*
9. Part G WAC 296-155-350 through 296-155-380 *Tools-Hand and Power*
10. Part H WAC 296-155-400 through 296-155-420 *Welding and Cutting*
11. Part I WAC 296-155-426 through 296-155-462 *Electrical*
12. Part J WAC 296-155-475 through 296-155-477 *Stairways*
13. Part K WAC 296-155-500 through 296-155-515 *Floor Openings, Wall Openings and Stairways*

14. Part L WAC 296-155-525 through 296-155-59920 *Cranes, Derricks, Hoists, Elevators and Conveyors*

15. Part M WAC 296-155-600 through 296-155-630 *Motor Vehicles, Mechanized Equipment and Marine Operations*

16. Part N WAC 296-155-650 through 296-155-66411 *Excavation, Trenching, and Shoring*

17. Part O WAC 296-155-675 through 296-155-699 *Concrete, Concrete Forms, Shoring and Masonry Construction*

18. Part P WAC 296-155-701 through 296-155-717 *Steel Erection*

19. Part Q WAC 296-155-725 through 296-155-74501 *Underground Construction*

20. Part R WAC 296-155-755 through 296-155-770 *Miscellaneous Construction Requirements*

21. Part S WAC 296-155-775 through 295-155-830 *Demolition*

22. Part V WAC 296-155-950 through 296-155-965 *Rollover Protective Structures and Overhead Protection*

M. STATE OF WASHINGTON DEPARTMENT OF LABOR AND INDUSTRIES
DIVISION OF INDUSTRIAL SAFETY AND HEALTH
CHAPTER 296-802 WAC EMPLOYEE MEDICAL AND EXPOSURE RECORDS

N. STATE OF WASHINGTON DEPARTMENT OF LABOR AND INDUSTRIES
DIVISION OF INDUSTRIAL SAFETY AND HEALTH
CHAPTER 296-842 WAC RESPIRATORS

O. STATE OF WASHINGTON DEPARTMENT OF LABOR AND INDUSTRIES
DIVISION OF INDUSTRIAL SAFETY AND HEALTH
CHAPTER 296-869 WAC ELEVATING WORK PLATFORMS

P. STATE OF WASHINGTON DEPARTMENT OF LABOR AND INDUSTRIES
DIVISION OF INDUSTRIAL SAFETY AND HEALTH
CHAPTER 296-876 WAC LADDERS, PORTABLE AND FIXED

Q. WASHINGTON STATE DEPARTMENT OF ECOLOGY

1. Chapter 173-303 WAC, Dangerous Waste Regulations

R. COMPRESSED GAS ASSOCIATION (CGA)

1. CGA Pamphlet G-7 - Compressed Air for Human Respiration

2. CGA Specification G-7.1 - Commodity Specification for Air

S. NATIONAL INSTITUTE FOR OCCUPATIONAL SAFELY AND HEALTH (NIOSH)

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

T. UNDERWRITERS LABORATORIES INC. (UL)

1. UL 586 - High-Efficiency, Particulate, Air Filter Units

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

V. Copies of Standards: Each Contractor/Subcontractor is required to be familiar with recognized industry standards applicable to their part of the Work. Copies of applicable standards are not bound within the technical specifications. 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.

W. Abbreviations, Names, and Addresses: Governmental agencies, trade association names and titles of general standards are frequently abbreviated. The following acronyms or abbreviations as referenced in contract documents are defined to meet the associated names. Both names and addresses are subject to change, and are believed to be, but are not assured to be, accurate and up-to-date as of date of Contract Documents:

AHERA	Asbestos Hazard Emergency Response Act
AIHA	American Industrial Hygiene Association 2700 Prosperity Avenue, Suite 250 Fairfax, Virginia 22031 (703) 849-8888
ANSI	American National Standards Institute (Headquarters) 1819 L Street Northwest, 6th Floor Washington, D.C. 20036 (202) 293-8020

ASHRAE	American Society for Heating, Refrigerating, and Air Conditioning Engineers 1791 Tullie Circle Northeast Atlanta, Georgia 30329 (404) 636-8400
ASTM	American Society for Testing and Materials 100 Barr Harbor Drive West Conshohocken, Pennsylvania (610) 832-9500
CFR	Code of Federal Regulations Government Printing Office (usually published in Federal Register) (866) 512-1800
DOT	Department of Transportation 400 7th Street Southwest Washington, D.C. 20590 (202) 366-4000
EPA	Environmental Protection Agency 1200 Pennsylvania Avenue Northwest Washington, D.C. 20460 (202) 272-0167
MSHA	Mine Safety and Health Administration (Headquarters) Arlington, Virginia (202) 693-9470
NIOSH	National Institute for Occupational Safely and Health 200 Independence Avenue Southwest Washington, D.C. 20201 (800) 356-4674
NIST	National Institute of Standards and Technology (formerly National Bureau of Standards) 100 Bureau Drive, Stop 1070 Gaithersburg, Maryland 20234 (301) 975-8295
OSHA	Occupational Safety and Health Administration (National Office) U.S. Department of Labor 200 Constitution Avenue Northwest Washington, D.C. 20210 (202) 693-2000
PAT	Proficiency Analytical Testing

2700 Prosperity Avenue, Suite 250
Fairfax, Virginia 22031 (703) 849-8888

UL Underwriters Laboratories
333 Pfingsten Road
Northbrook, Illinois 60062 (847) 272-8800

WAC Washington Administrative Code

WISHA Washington Industrial Safety and Health Act

WSDOE Washington State Department of Ecology, Eastern Regional Office
4601 North Monroe
Spokane, Washington 99205 (509) 329-3400

WSDLI Washington State Department of Labor and Industries
Division of Industrial Safety and Health
North 901 Monroe, Suite 100
Spokane, Washington 99201 (509) 324-2600

WSU-EHS Washington State University
Environmental Health & Safety
Post Office Box 641172
Pullman, Washington 99164-1172 (509) 335-3041

1.05 DEFINITIONS

A. Abatement: Procedures to decrease or eliminate the source of fiber release from asbestos-containing building materials. Includes encapsulation, enclosure, and removal.

B. Adequately Wet: To sufficiently mix or penetrate with liquid to prevent the release of particles.

C. Action Level: An airborne concentration of asbestos fibers, in the breathing zone of a worker equaling 0.1 fibers per cubic centimeter of air calculated as an 8-hour time weighted average.

D. Air Monitoring: The process of measuring the fiber content of a specific volume of air.

E. Amended Water: Water containing a wetting agent or surfactant with a surface tension of 29 dynes per square centimeter when tested in accordance with ASTM D 1331.

F. Area Sampling: Sampling of asbestos fiber concentrations within the asbestos control area and outside the asbestos control area which approximates the concentrations of asbestos in the theoretical breathing zone but is not actually collected in the breathing zone of an employee.

G. Asbestos: The term asbestos includes chrysotile, amosite, crocidolite, tremolite, anthophyllite, and actinolite and any of these minerals that has been chemically treated or altered. Materials are considered to contain asbestos if the asbestos content is more than one percent of the material.

H. Asbestos-Containing Material (ACM): Any material containing more than one percent asbestos of any type or mixture of types by weight.

I. Asbestos-Containing Building Material (ACBM): Surfacing ACM, thermal system insulation ACM, or miscellaneous ACM that is found in or on interior structural members or other parts of a building.

J. Asbestos-Containing Waste Material: Any material which is, or is suspected of being, or any material contaminated with an asbestos-containing material which is to be removed from a work area for disposal.

K. Asbestos Control Area: That area where asbestos removal operations are performed which is isolated by physical boundaries that assist in the prevention of the uncontrolled release of asbestos dust, fibers, or debris.

L. Asbestos Fibers: Those fibers having an aspect ratio of at least 3:1 and longer than 5 micrometers as determined by National Institute for Occupational Safety and Health (NIOSH) Method 7400.

M. Asbestos Permissible Exposure Limit: 0.1 fibers per cubic centimeter of air as an 8-hour time weighted average as defined by WAC 296-62-077 or federal legislation having legal jurisdiction for the protection of workers health.

N. Authorized Visitor: The Owner or Owner's designee, testing lab personnel, emergency personnel or a representative of any federal, state and local regulatory agency having authority over the project.

O. Background: Normal airborne asbestos concentration in an area similar to the asbestos abatement area but in an uncontaminated (with asbestos) state.

P. Category I Non-friable Asbestos-Containing Material: Asbestos-containing packing, gaskets, resilient floor coverings, and asphalt roofing products

containing more than 1% asbestos that when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

Q. Category II Non-friable Asbestos-Containing Material: Any material, excluding Category I materials, containing more than 1% asbestos that when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

R. Certified Asbestos Supervisor: The Contractor's representative at the work site who is certified by the Washington Department of Labor and Industries in accordance with Chapter 296-65-012 of the WAC.

S. Certified Asbestos Worker: An individual who is certified by the Washington Department of Labor and Industries in accordance with Chapter 296-65-010 in the WAC.

T. Contractor: The Contractor is that individual or entity under contract to perform the herein listed work.

U. Encapsulant: Specific materials in various forms used to chemically entrap asbestos fibers in various configurations to prevent these fibers from becoming airborne. There are four types of encapsulant as follows, which must comply with performance requirements as specified herein.

1. Removal Encapsulant (can be used as a wetting agent)

2. Bridging Encapsulant (used to provide a tough, durable surface coating to asbestos containing material)

3. Penetrating Encapsulant (used to penetrate the asbestos containing material down to substrate, encapsulating all asbestos fibers)

4. Lock-Down Encapsulant (used to seal off or "lock-down" minute asbestos fibers left on surfaces from which asbestos containing material has been removed)

V. Enclosure: The construction of an airtight, impermeable, permanent barrier around asbestos-containing material to control the release of asbestos fibers into the air.

W. Friable Asbestos Material: Material that contains more than one percent asbestos by area and that can be crumbled, pulverized, or reduced to powder by hand pressure when dry.

X. Glovebag Technique: Those asbestos removal and control techniques put forth in WAC 296-62-077.

Y. HEPA Filter Equipment: High efficiency particulate air (HEPA) filtered vacuum and/or exhaust ventilation equipment with a filter system capable of collecting and retaining asbestos fibers. Filters shall retain 99.97 percent of particles 0.3 microns or larger as indicated in UL 586.

Z. Industrial Hygienist (IH): That industrial hygienist employed by the Contractor to monitor, sample, and/or inspect the work separate from the original construction contract. In some instances the Contractor's IH shall perform assigned duties vicariously through a trained subordinate but only with the specific consent of the Owner.

AA. Negative Pressure: Air pressure lower than surrounding areas, minimum 0.02 inches of water pressure differential, caused by exhausting air from a sealed space (work area).

BB. Non-friable Asbestos Material: Material that contains asbestos in which the fibers have been temporarily locked in by a bonding agent, coating, binder or other material so that the asbestos is well bound and will not normally release asbestos fibers during any appropriate use, handling, storage or transportation. It is understood that asbestos fibers will be released under other conditions such as demolition or removal.

CC. Owner: Washington State University (WSU). Represented by an employee of WSU or an independent consultant to WSU such as an environmental consultant, industrial hygienist or architect. The Owner may delegate responsibilities assigned to the "Owner" within this specification to an independent consultant. Any specified limits of liability afforded to the "Owner" shall also extend to the independent consultant.

DD. Personal Sampling: Air sampling to determine asbestos fiber concentrations within the breathing zone of a specific employee, performed in accordance with WAC 296-62-077.

EE. Respirator: A device designed to protect the wearer from the inhalation of harmful atmospheres.

FF. TEM: Refers to Transmission Electron Microscopy.

GG. Time Weighted Average (TWA): The TWA is an 8-hour time weighted average airborne concentration of asbestos fibers. At least three full shift samples per person are required to establish that person's TWA exposure.

HH. Wetting Agent: That specific agent used to reduce airborne asbestos levels by physically bonding asbestos fibers to material to be removed. An equivalent wetting agent must have a surface tension of at least 29 dynes per square centimeter as tested in accordance with ASTM D 1331.

II. PCM: Phase Contrast Microscopy

JJ. PLM: Polarized Light Microscopy

KK. Class 1 Asbestos Abatement Project: Project or project tasks that may disturb friable asbestos containing materials and includes all projects/tasks involving thermal system insulation or sprayed-on or troweled-on asbestos containing materials.

LL. Class 2 Asbestos Abatement Project: Project or project tasks that may disturb materials not in Class 1 including non-friable asbestos containing materials such as floor tile and sheeting, construction mastics, roofing and siding shingles.

1.06 SUBMITTALS

A. Submittals shall be submitted to the Owner for review 10 days prior to commencing work involving asbestos abatement.

B. Submittal Documentation: The Contractor shall submit THREE (3) bound copies of each pre-construction submittal listed below to the Owner for review.

1. Contractor's Accident Prevention Program and Safety Program including Respiratory Protection Program.

2. Contractor's Asbestos Abatement Plan and Schedule.

3. Contractor-Owned Equipment.

4. Employee training certificates including Washington State Certified Asbestos Worker, Certified Asbestos Supervisor, AHERA Project Designer.

5. Copies of Contractor's Notifications and Permits.

6. Testing laboratory and Contractor's qualified air sampling employee(s).

7. Disposal site designations.

8. Contractor's respirator fit test records and medical approvals for personnel to be engaged in tasks disturbing asbestos-containing materials.

C. Contractor shall certify the Owner can rely on the accuracy and completeness of all certifications submitted in compliance with these specifications. Contractor shall review and approve all submittal documents prior to submittal

to the Owner. The Contractor shall stamp each submittal with the following statement:

1. "The Contractor hereby represents that he has determined and verified all field measurements, hazardous materials quantities, field construction/demolition criteria, materials, catalog numbers and similar data, and has checked and coordinated each submittal with the requirements of the work and of the Contract Documents."

D. Accident Prevention Program and Safety Program: Submit the Contractor's Accident Prevention Program and Safety Program for review. The programs will meet the minimum WISHA requirements of the construction industry regulations (WAC 296-155), general industry standards when applicable (WAC 296-62), and the general safety and health requirements for all employers (WAC 296-800 and WAC 296-24).

E. Contractor's Asbestos Hazard Abatement Plan and Schedule (Work Plan): Submit a detailed plan of the safety precautions and work procedures to be used in the selective demolition, removal and proper disposal of asbestos-containing building materials. Such plan shall include but not be limited to:

1. Personal protective equipment to be used by workers and visitors;
2. Location of asbestos control areas including clean and dirty areas, buffer zones, showers, storage areas, and change rooms;
3. Locations, numbers, and type of HEPA exhaust equipment;
4. Asbestos-containing materials specific removal methods;
5. A detailed description of the method to be employed in order to control fiber releases;
6. Sequencing and anticipated completion dates of asbestos related work;
7. Material and personnel decontamination procedures;
8. Planned air monitoring strategies;
9. Disposal plan;
10. Type of wetting agent and asbestos sealer to be used;
11. Site security and interface of trades involved in the construction, and;
12. Emergency response plan including fire and medical emergencies.

F. Prior to the start of any asbestos abatement work the Owner must review the Work Plan. The Contractor shall meet with the Owner prior to beginning work, to discuss in detail the asbestos abatement plan, including work procedures and safety precautions. Once reviewed by the Owner, the Work Plan will be enforced as if an addition to the specification. Any changes required in the specification as a result of the Work Plan, shall be identified specifically in the Work Plan to allow for discussion by the Owner prior to the start of work.

1. Review of the Contractor's Work Plan by the Owner does not transfer any level of responsibility to the Owner for the contents of the Work Plan. Changes in the Contractor's Work Plan, required for any reason during the course of the project, shall be the responsibility of the Contractor. The Owner shall be held harmless by the Contractor for any dispute arising from, or in connection with, required changes in the Contractor's Work Plan.

G. Contractor-Owned and/or Rental Equipment: Any contractor, subcontractor, or supplier submitting a bid warrants that all systems, processes, and equipment which is subject to a valid patent, copyright or other intellectual property rights are used subject to a current and valid licensing agreement. Any contractor, subcontractor or supplier using such system, process or equipment agrees to defend, indemnify and hold the Owner harmless from any costs, expenses and liabilities arising out of the infringement of any patent, copyright or intellectual property right. The Owner does not assume any obligation or liability for insuring that such patent, copyright or intellectual property rights are honored. The use of such systems, processes or equipment is within the exclusive control of the Contractor.

H. Submit manufacturer's data on the following Contractor-owned and/or rental equipment:

1. HEPA exhaust equipment.

2. Portable HEPA Vacuums.

3. Respirators.

4. Pressure differential automatic recording instrument.

5. Glovebags.

6. Amended water, chemical encapsulants, and sealants.

7. Water filtration equipment.

8. Solvents to be used for mastic removal.

9. Safety Data Sheets (SDS) for materials proposed for use on-site.

I. Employee Training: Submit current copies of Washington State Certified Asbestos Worker and Supervisor training certificates for each worker and/or supervisor working on this project. The training certificate must show the employee to have current certifications. Any workers without current certifications will not be allowed on the job site.

J. Contractor's Notifications and Permits: Submit copies of the permits, notifications or licenses, including amendments, required for this project. Submit copies of Ecology and L&I notification forms, including any addendums, to WSU-EHS concurrent with submittal to Ecology and L&I.

K. Testing Laboratory: Submit the name, address, and telephone number of the testing laboratory selected for the analysis which is a current successful participation in the American Industrial Hygiene Association (AIHA) Proficiency Analytical Testing (PAT) Program. Where analysis to determine asbestos content in bulk materials is required, submit evidence that the National Institute of Science and Technology (NIST) accredits the laboratory under National Voluntary Laboratory Accreditation Program (NVLAP) for asbestos analysis.

L. Disposal Site Designation: Submit written evidence the landfill for asbestos waste disposal is approved for asbestos disposal by the state and local governmental agencies. Submit detailed delivery tickets, prepared, signed and dated by an agent of the landfill, certifying the amount of asbestos materials delivered to the landfill, within 3 days after delivery.

M. Field Test Reports: During abatement, the Contractor shall submit project documentation to the Owner in writing within three days of the receipt of data. The following documentation will be submitted:

1. Air sampling data.

2. Pressure differential recordings for negative pressure enclosures.

3. Asbestos disposal quantity report.

N. Air Sampling Data: The Owner shall provide clearance sampling for the abatement project. The Owner may perform additional air sampling to confirm sampling results obtained by the Contractor. The Owner may perform additional sampling to ensure that asbestos fibers are not being released from the regulated area. The results of sampling by the Owner shall be made available to the Contractor within 72 hours of receipt by the Owner. The

Contractor is responsible for all other air sampling requirements. Complete fiber counting and provide results to the Owner for review within 72 hours (NOTE: If sample analysis is performed on-site, this information must be provided within 24 hours) of receipt by the Contractor. Notify the Owner immediately of any airborne concentrations of asbestos fibers in excess of the acceptable limits. The testing laboratory employee performing air sampling, the employee that analyzed the sample, and the Contractor's qualified sampling personnel, must sign the sampling results.

O. Pressure Differential Recordings for Negative Pressure Enclosures: Provide a negative pressure enclosure that creates a negative pressure of at least 0.02 inches of water relative to the pressure external of the enclosure and operate it continuously, 24 hours a day, until the enclosure of the asbestos control area is removed. Submit pressure differential recordings for each work day to the Owner within 72 hours from the end of each work day. Notify the Contractor and the Owner immediately of any variance in the pressure differential which could cause adjacent unsealed areas to have asbestos fiber concentrations in excess of 0.01 fibers per cubic centimeter of air (fibers/cc) or background whichever is higher. In no circumstance shall airborne fiber asbestos concentrations exceed 0.1 fibers per cubic centimeter.

P. Project Closeout Submittals: The Contractor shall submit five (5) bound copies of project closeout submittals to the Owner within 30 days of project completion. The Contractor shall not be entitled to final payment until receipt and acceptance of the final closeout submittals by the Owner. The closeout submittals include:

1. Project description;
2. Contractor letter of substantial completion;
3. Guarantees required by the Contract with the Owner and any other extended guarantees stated in the technical sections of the specifications;
4. Release or waiver of liens;
5. Copies of permits, notifications, and any amendments;
6. Affidavits of Prevailing Wages Paid;
7. Contractor's "Asbestos Project Designer" Certification(s);
8. Contractor's "Asbestos Supervisor" Certification(s);
9. Contractor's "Asbestos Worker" Certification(s);

10. Contractor's "Start and Finish" Project Dates;

11. Hazardous Waste Manifest/Disposal Site Receipts with full signatures;

12. Air monitoring and laboratory data sheets with full signatures (including chain of custody forms);

13. Daily field logs;

14. Site visitor and personnel logs;

15. Statement by Contractor that vehicles used during disposal were properly labeled during loading, transportation, and unloading;

16. Documentation of the initial cleaning prior to the start of asbestos abatement work;

17. Documentation that a visual inspection was completed after asbestos abatement work was completed;

18. Accident reports and employee discipline reports;

19. Certification by the Contractor that complete abatement of subject ACM and/or PACM occurred;

20. Certification by the Contractor that replacement materials do not contain asbestos;

21. Documentation by the Contractor clearly identifying asbestos-containing materials remaining in the work area (maps or drawings are preferred);

22. A drawing/map or drawings/maps of locations showing areas where materials were abated;

23. An accurate description of materials removed, including the amount of each material;

24. Abatement supervisor field notes;

25. Copies of any regulatory notifications, including amendments, that were filed, and;

26. All submittals as required elsewhere in the technical specifications (including but not limited to respirator fit records, medical fitness-for-duty approvals, etc.)

PART 2 - PRODUCTS

2.01 ENCAPSULANT

A. Shall conform to current US EPA requirements, contain no toxic or hazardous substances, contain no solvents, and shall conform to the following performance requirements. Products shall meet the criteria of the current revision of referenced standards.

B. Removal Encapsulant

Requirement	Test Standard
Flame Spread, 25 Smoke Emission, 50	ASTM E 84
Combustion Toxicity Zero Mortality	University of Pittsburgh Protocol
Life Expectancy - 20 years	ASTM C 732 Accelerated Aging Test
Permeability - Minimum 0.4 perms	ASTM E 96

C. Bridging Encapsulant

Requirement	Test Standard
Flame Spread, 25 Smoke Emission, 50	ASTM E 84
Combustion Toxicity Zero Mortality	University of Pittsburgh Protocol
Life Expectancy - 20 years	ASTM C 732 Accelerated Aging Test
Permeability - Minimum 0.4 perms	ASTM E 96
Cohesion/Adhesion Test - 50 pounds of force/foot	ASTM E 736

Fire Resistance – Negligible affect on fire resistance rating over 3 hour test (Classified by UL for use over fibrous and cementitious sprayed fireproofing)	ASTM E 119
Impact Resistance - Minimum 43 in/lb	ASTM D 2794, Gardner Impact Test
Flexibility - no rupture or cracking	ASTM D 522, Mandrel Bend Test

D. Penetrating Encapsulant

Requirement	Test Standard
Flame Spread 25 Smoke Emission 50	ASTM E 84
Combustion Toxicity Zero Mortality	University of Pittsburgh Protocol
Life Expectancy - 20 years	ASTM C 732, Accelerated Aging Test
Permeability - Minimum 0.4 perms	ASTM E 96
Cohesion/Adhesion Test - 50 pounds of force/foot	ASTM E 736
Fire Resistance - Negligible affect on fire resistance rating over 3 hour test (Classified by UL for use over fibrous and cementitious sprayed fireproofing)	ASTM E 119
Impact Resistance - Minimum 43 in/lb	ASTM D 2794, Gardner Impact Test
Flexibility - no rupture or cracking	ASTM D 522, Mandrel Bend Test

E. Lock-down Encapsulant

Requirement	Test Standard
Flame Spread, 25 Smoke Emission, 50	ASTM E 84
Combustion Toxicity Zero Mortality	University of Pittsburgh Protocol
Life Expectancy - 20 years	ASTM C 732 Accelerated Aging Test
Permeability - Minimum 0.4 perms	ASTM E 96
Fire Resistance - Negligible affect on fire resistance rating over 3 hour test (Tested with fireproofing over encapsulant applied directly to steel member)	ASTM E 119
Bond Strength - 100 pounds of force/ foot (Tests compatibility with cementitious and fibrous fire-proofing)	ASTM E 736

2.02 BARRIER SHEETING

A. Unless otherwise authorized by the Owner, use only UL listed fire retardant plastic sheeting, of at least 6 mil thickness, for the construction of critical barriers, covering and sealing walls and other surfaces, and bagging waste in containment areas.

PART 3 - EXECUTION

3.01 EQUIPMENT

A. Contractor shall make available to the Owner, two complete sets of personal protective equipment as required herein for entry to the asbestos control area at all times for inspection of the asbestos control area. Contractor shall provide manufacturer's certificate of compliance for all equipment required to contain airborne asbestos fibers. The Owner will be allowed entry to the work areas at all times for the purpose of inspection and verification of activities.

1. Respirators: Select respirators from those approved by the National Institute for Occupational Safety and Health (NIOSH), Department of Health and Human Services.

2. Respirators for Handling Asbestos: The use of respiratory protection must be designated in writing by the Contractor's qualified air sampling employee. The request shall identify the specific type of respiratory protection requested and the reasoning behind the choice. Forward the request to the Owner who will provide a written response to the request. A different request shall be filed for each type of operation. All respiratory protection shall comply with the spirit and letter of WAC 296-62-077 and WAC 296-842. The respirator type required for the removal of the thermal system insulation (TSI) shall be determined by the level of airborne fibers as follows:

Level of Contamination	Type of Respirator Required
Not in excess of 1 f/cc	Half-mask air-purifying with HEPA filter
Not in excess of 5 f/cc	Full-face piece air-purifying with HEPA
Not in excess of 100 f/cc	Full-face piece, tight fitting, powered air purifying with HEPA or full-face piece supplied air designed to operate in continuous-flow or pressure-demand mode.
Not in excess of 1,000 f/cc	Full-face piece self-contained breathing apparatus designed to operate in pressure demand mode.

Note: f/cc denotes fibers per cubic centimeter

B. Exterior Whole Body Protection: Paragraph 3.01B describes the equipment and procedures required for protecting workers against asbestos contamination and other workplace hazards that may occur during asbestos removal and disposal activities (except for respiratory protection).

1. Protective Clothing: Provide personnel exposed to asbestos with disposable, whole body protective clothing, head coverings, gloves and foot coverings. Provide disposable plastic or rubber gloves to protect hands. Cloth gloves may be worn inside the plastic or rubber gloves for comfort, but shall not be used alone. Make sleeves secure at the wrists, make foot coverings secure at the ankles and make clothing secure at the neck.

2. Work Clothing: Provide cloth work clothes for wear under the disposable protective coveralls and foot coverings and either dispose of or properly launder them as recommended by an IH after use.

C. Decontamination Unit: Provide a decontamination area appropriate for the specific asbestos abatement activity. Decontamination units shall be physically attached to the asbestos control area. Build both a personnel decontamination unit and an equipment decontamination unit onto and integral with each asbestos control area. HEPA vacuum and remove asbestos contaminated disposable protective clothing while still wearing respirators at the boundary of the asbestos work area and seal in impermeable bags or containers for disposal. Dispose of asbestos contaminated work clothing as asbestos contaminated waste. Do not wear work clothing between home and work. Negative pressure units shall be constructed with a separate decontamination room and a clean room with a shower that complies with WAC 296-800-230. Locate showers between the decontamination room and the clean room and require that all employees shower before changing into street clothes. Collect used shower water and filter to remove asbestos contamination with approved water filtration equipment. Dispose of filters and residue as asbestos waste. Discharge clean water to the sanitary system.

D. Eye Protection: Provide goggles to personnel engaged in asbestos operations when the use of a full-face respirator is not required.

E. Warning Signs and Labels: Provide warning signs at all approaches to asbestos control areas containing concentrations of airborne asbestos fibers. Locate signs at such a distance that personnel may read the sign and take the necessary protective steps required before entering the area. Provide labels and affix to all asbestos materials, scrap, waste, debris, and other products contaminated with asbestos.

F. Warning Sign: Provide vertical format conforming to WAC 296-62-07721(5) and to a minimum 20 by 14 inches displaying the following legend in the lower panel. Spacing between lines shall be at least equal to the height of the upper of any two lines.

DANGER
ASBESTOS
CANCER AND LUNG DISEASE HAZARD
AUTHORIZED PERSONNEL ONLY
RESPIRATORS AND PROTECTIVE CLOTHING ARE REQUIRED IN THIS AREA

G. Warning Labels: Provide labels conforming to WAC 296-62-07721(6) and WAC 296-800-170 of sufficient size to be clearly legible, displaying the following legend:

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

H. Vacuums shall be leak proof to the HEPA filter. Filters on vacuums shall conform to ANSI Z9.2 and UL 586. Do not use power tools to remove asbestos containing materials unless the tool is equipped with effective, integral HEPA filtered exhaust ventilation systems. Remove all residual asbestos from reusable tools prior to storage or reuse.

I. Rental Equipment: If rental equipment is to be used, furnish written notification to the rental agency concerning the intended use of the equipment and the possibility of asbestos contamination of the equipment.

3.02 WORK PROCEDURE

A. Perform asbestos related work in accordance with WAC 296-62-077 and as specified herein. Personnel shall wear and utilize protective equipment as specified herein. Eating, smoking, drinking, or applying cosmetics shall not be permitted in the asbestos work or control areas. Personnel of other trades not engaged in the removal and demolition of asbestos shall not be exposed at any time to airborne concentrations of asbestos unless the trade personnel comply with all the personnel protection provisions of this specification. Shut down the building air handling system, cap the openings to the system and provide temporary ventilation prior to the commencement of asbestos work. Disconnect electrical service when wet removal is performed and provide temporary electrical service prior to the use of any water. If an asbestos spill occurs outside of the asbestos control area, stop work immediately, correct

the condition to the satisfaction of the Owner including clearance sampling, prior to resumption of work.

B. Protection of Existing Work to Remain: Perform demolition work without damage or contamination of adjacent work. Where such work is damaged or contaminated as verified by the Owner using visual inspection or sample analysis, it shall be restored to its original condition or decontaminated by the Contractor at no expense to the Owner as deemed appropriate by the Owner. This includes inadvertent spill of dirt, dust or debris in which it is reasonable to conclude that asbestos may exist. When these spills occur, stop work immediately. Then clean up the spill. When satisfactory visual inspection and air sampling results are obtained by, or supplied to, the Owner work may proceed.

C. Furnishings: If there is furniture or equipment to be protected in place or removed from the area of work prior to the beginning of the asbestos work, the Contractor will coordinate this activity with the Owner. In addition, casework may need to be moved by the Contractor to access asbestos-containing materials.

D. Pre-cleaning: Wet wipe and HEPA vacuum all surfaces with asbestos debris prior to establishment of containment.

E. Asbestos Control Area Requirements: Construct decontamination units when required and permit access to the work only through the decontamination unit. All other means of access shall be closed off and sealed and warning signs displayed on the clean side of the sealed access. In areas where access must be maintained during work, a single layer black polyethylene shall be erected around the enclosures and decontamination unit. Construct temporary structural hard partitions to separate work areas from student/faculty occupied areas. Construct hard partitions with wood or metal studs, covered with plywood or gypsum board.

F. Negative Pressure Enclosure: If required, establish an asbestos negative pressure enclosure with the use of curtains, portable partitions, or other enclosures in order to prevent the escape of asbestos fibers from the contaminated asbestos work area. Containment development shall include, as appropriate e.g. when the surface in question is not the focus of abatement: Protective covering of walls, and ceilings with a continuous membrane of two layers of minimum 6-mil plastic sheet sealed with tape to prevent water or other damage. Two layers of 6-mil plastic sheet sealed with tape over floors and extend a minimum of 12-inches up walls. Seal all joints with tape. Provide HEPA exhaust system in the asbestos control area.

Openings will be allowed in enclosures of asbestos control areas for the supply and exhaust of air for the local exhaust system. Replace filters as required to maintain the efficiency of the system.

G. Asbestos Handling Procedures: This section describes the procedures for removal of the asbestos-containing materials and materials that contain less than 1% asbestos, including removal methods, air sampling, and encapsulation or lockdown of remaining fibers. The work procedures referenced herein are to be regarded as informational only for the guidance and clarification of industry accepted work practices and regulatory compliance. The inclusion or omission of a specific work practice or regulatory requirement does not relieve the contractor from responsibility and requirements for performing the work in strict compliance with applicable codes, standards, and regulations, as well as, generally accepted industry practices.

1. Glovebags: Glovebags shall consist of 6 mil plastic bags which are seamless at the bottom. Each glovebag shall be installed so that it completely covers the circumference of the pipe where the work is to be done. The glovebags should be smoke tested for leaks, and any such leaks should be sealed prior to commencement of the abatement activities. Glovebags may be used only once, and may not be moved. Glovebags shall not be used on surfaces whose temperature exceeds 150 degrees F. Where unusual circumstances prohibit the use of 6 mil plastic bags, submit an alternate proposal for containment of asbestos fibers to the Owner's Consultant for approval. For example, in the case where both piping and insulation are to be removed, the Contractor may elect to wet the insulation and wrap the pipes and insulation in plastic and remove the pipe by sections. Wet asbestos material with a fine spray of amended water prior to and during removal, cutting, or other handling so to reduce the emission of airborne fibers. Remove material and drop into the 6 mil plastic disposal bags hanging from the pipes. Prior to disposal, glovebags shall be collapsed by removing the air within them using a HEPA vacuum.

2. Vinyl Flooring - Flooring or its backing shall not be sanded. Vacuums equipped with HEPA filter, disposable dust bag, and metal floor tool (no brush) shall be used to clean floors. Resilient sheeting shall be removed by cutting with wetting of the snip point and wetting during delaminating. Rip-up of resilient sheet floor material is prohibited. All scraping of residual adhesives and/or backing shall be performed using wet methods. Dry sweeping is prohibited. Mechanical chipping is prohibited unless performed in a negative pressure enclosure which meets the requirements of WAC 296-62-07712 (7) (a). Plastic sheeting shall be applied to walls and other vertical surfaces from the floor to a height of four feet to prevent damage (e.g., staining) due to incidental splashing of mastic remover.

3. Roofing: Roofing material shall be removed in an intact state to the extent feasible. Wet methods shall be used to remove roofing materials that are not intact, or that will be rendered not intact during removal, unless the contractor can demonstrate to the Owner that such wet methods are not feasible or will create safety hazards. Roofing material debris shall be lowered to the ground by hand, crane, or hoist, alternatively, a dust-tight chute may be used. In any case, removed roofing debris shall be lowered to the ground prior to the end of the work shift and placed in a closed receptacle. Roof level heating and ventilation intakes shall be isolated or the ventilation system shut down during roof removal. Demolition of the buildings with the roofing material in place shall be conducted in accordance with requirements detailed in Washington State Department of Labor and Industries Regional Directive 23.35 *Demolition of Buildings with Asbestos-Containing Materials*.

4. Cement Asbestos Board: Cutting, abrading or breaking cement asbestos board (a.k.a. transite panel) is prohibited unless it can be demonstrated to the Owner that methods less likely to result in asbestos fiber release cannot be used. Each panel must be sprayed with amended water prior to removal. Unwrapped or unbagged panels must be immediately lowered, not dropped, to the ground or placed in an impervious waste bag of wrapped in plastic sheeting and lowered to the ground no later than the end of the work shift.

5. Materials that contain less than 1% asbestos: Although not regulated as an asbestos project, disturbing materials with <1% asbestos requires a state certified Supervisor/Competent person to be present per WAC 296-62-07728, and the use of basic asbestos work practices outlined in WAC 296-62-017712(2). Work practices include the use of wet, non-aggressive methods and prompt clean-up. Vacuums used must be HEPA filtered. At a minimum, worker training must include asbestos awareness and hands on training outlined in WAC 296-62-07722(5). Respiratory protection must be used in the absence of a negative exposure assessment to maintain personnel exposures below the permissible exposure limit (PEL).

H. Air Sampling: Sampling airborne concentrations of asbestos fibers for pre-abatement and clearance shall be performed by the Owner in accordance with WAC 296-62-077 and as specified herein. Personal sampling and area sampling required by WAC 296-62-077 inside and outside the regulated area shall be performed by the Contractor, specifically by personnel qualified to perform such sampling. Sampling performed for environmental, quality control and work acceptance reasons may be performed by the Owner at any time before, during and after work performed by the Contractor. Unless otherwise specified, the NIOSH Method 7400 for sampling and analysis is used. Monitoring may be duplicated by government agencies at the discretion of the

Owner. If the air sampling results obtained by government agencies differ from those results obtained by the Contractor, the government agency's results shall prevail. Calibration of the air sampling equipment shall be conducted prior to and after air sampling. Calibration documentation shall be provided to the Owner.

1. Sampling Prior to Asbestos Work: The Contractor shall provide adequate notification to allow the Owner to conduct area air sampling and establish the baseline one day prior to the masking and sealing operations for each removal site. The background may be established by performing area sampling in similar but uncontaminated sites in the building. The Contractor may replicate such sampling at their discretion, at no cost to the Owner.

2. Sampling During Asbestos Work: The Contractor's qualified person shall provide personal sampling as indicated in WAC 296-62-077. At the same time the Contractor's qualified person shall conduct area sampling outside the work area. If applicable, this shall include the clean room entrance to the containment and at the exhaust opening of the local exhaust system. Thereafter, provided the same type of work is being performed, the Contractor's qualified person may limit area sampling to once every work shift alternating between the clean room entrance to the containment and the exhaust opening of the local exhaust system. If sampling outside the containment shows airborne fiber/asbestos fiber concentrations have exceeded background or 0.01 fibers/cc, whichever is greater, stop all work, correct the condition(s) causing the increase, and notify the Owner immediately.

3. Sampling During Demolition of Materials Containing Less than 1% Asbestos: The Contractor's qualified person shall provide personal breathing zone air sampling to evaluate respiratory protection requirements and maintain personnel exposures below the PEL. Sampling protocols must comply with WAC 296-62-07709.

4. Sampling After Final Clean-Up (Clearance Sampling): After final cleanup and the asbestos control area is dry but prior to clearance sampling, the Owner shall perform a visual inspection referencing ASTM E 1368 to verify the asbestos control and work area is free of any accumulations of dirt, dust, or debris. Following the visual inspection, the Owner will provide area sampling of asbestos fibers according to WAC 296-62-077. The Owner will submit written documentation of the visual inspection and clearance sampling to the Contractor within 24 hours from receipt of clearance sample data. Contractor's engineering controls, containment barriers, enclosures and asbestos control areas shall remain intact until

acceptable analytical results of the clearance air monitoring is confirmed by the Owner.

i. Should any of the clearance samples fail to comply with the clearance requirements of WAC 296-62-077 or exceed 0.01 fibers/cc, the Contractor will be notified of the results and instructed to re-clean the area. Upon written notification by the Contractor that the area has been re-cleaned and is ready for clearance testing the Owner will collect an additional set of clearance samples. These procedures will be repeated until the clearance testing is successfully completed. All costs for additional testing required as a result of failed clearance testing will be at the Contractor's expense. When the reported analytical results of the final clearance samples comply with the clearance requirements of WAC 296-62-077 and document airborne fiber concentrations are less than or equal to 0.01 fibers/cc, the Contractor may disassemble the asbestos control area.

I. Visual Acceptance Inspection: After final cleanup and the asbestos control area is dry but prior to clearance sampling, the Owner shall perform a visual inspection referencing ASTM E 1368 to verify the asbestos control and work area is free of any accumulations of dirt, dust, or debris. The Contractor shall notify the Owner that asbestos abatement is complete and the area is ready for the Owner's visual acceptance inspection. The notification shall be in writing and 72 hours prior to the requested date of the Owner's visual acceptance inspection. Should the Contractor fail the Owner's visual acceptance inspection, the Contractor will be instructed to correct the deficiency. Upon written notification by the Contractor the deficiency has been corrected, the Owner will conduct an additional visual acceptance inspection. These procedures will be repeated until an acceptable visual inspection is completed. All costs for additional inspections required as a result of deficiencies will be at the Contractor's expense.

J. Lock Down: Prior to removal of plastic barriers and after pre-clearance clean up of gross contamination, a visual inspection of all areas affected by the removal of the asbestos contaminated materials for any visible fibers, shall be conducted by the designated competent person and submitted in writing to the Owner for approval. A post removal (lock down) encapsulant shall then be spray applied to ceiling, walls, floors and other areas exposed in the removal area. The exposed area shall include but not be limited to plastic barriers, furnishings and articles to be discarded as well as the dirty change room, air locks for bag removal and decontamination chambers.

K. Site Inspection: While performing asbestos removal work, the Contractor shall be subject to on-site inspection by the Owner who may be assisted by or represented by safety or industrial hygiene personnel. If the work is found to

be in violation of this specification, the Owner will issue a stop work order to be in effect immediately and until the violation is resolved. Standby time required to resolve the violation shall be at the Contractor's expense.

3.03 CLEAN-UP AND DISPOSAL

A. Housekeeping: Essential parts of asbestos dust control are housekeeping and clean-up procedures. This includes demolition of materials that contain less than 1% asbestos. Maintain surfaces of the asbestos control area free of accumulations of asbestos fibers. Give meticulous attention to restricting the spread of dust and debris; keep wastes from being distributed over the general area. Use HEPA filtered vacuum cleaners. Do not dry sweep or blow down the space with compressed air.

B. Title to Materials: All materials resulting from asbestos abatement work, except as specified otherwise, shall become the property of the Contractor and shall be disposed of as specified in applicable local, state, and federal regulations.

C. Disposal of Asbestos

1. Cleanup: Collect asbestos waste, including waste that contains less than 1% asbestos, asbestos contaminated water, scrap, debris, bags, containers, equipment and asbestos contaminated clothing and place in sealed fiber-proof, leak-proof, non-returnable containers (e.g. double plastic bags 6 mils thick, cartons, drums or cans). Wastes within the containers must be wetted to insure the security of the material in case of container breaching. Maintain surfaces of the asbestos control area free of accumulations of asbestos fibers. Restrict the spread of dust and debris; keep waste from being distributed over the general area. Do not dry sweep or blow down the space with compressed air. After cleanup, remove filters on the building air handling system in the control area and provide new filters. Handle and dispose of filters and asbestos-contaminated materials. Re-establish HVAC, mechanical, and electrical systems in working order. The Contractor may forego replacement of air handling system pre-filters and the reestablishment of the air handling, mechanical and electrical systems if building demolition is eminent.

D. Removal of Asbestos Waste Containers: Store asbestos waste containers in the asbestos control area until the control area cleanup is complete, or provide a waste container removal system. Asbestos waste containers shall not be removed through the change rooms. The waste container removal system shall consist of a wash-down station inside the asbestos control area, a washroom, and a waste container holding area. Provide caution signs as specified herein for asbestos control areas. The waste container removal

system shall be a temporary unit constructed to prevent the escape of asbestos fibers from the area. Perform cleanup of the waste container removal system as specified herein for enclosed asbestos control areas. Do not remove the waste container removal system enclosure and caution signs prior to the Owner certification of clearance.

E. Disposal of Asbestos: Affix a warning and Department of Transportation (DOT) label to each bag or use at least 6 mil thick bags with the approved warnings and DOT labeling pre-printed on the bag. Dispose of waste asbestos material at an Environmental Protection Agency (EPA) approved sanitary landfill selected by the Owner. For temporary storage, store sealed impermeable bags in asbestos waste drums or skids. The Owner must approve an area for interim storage of asbestos waste-containing drums or skids. Procedure for hauling and disposal shall comply with 40 CFR 61, Subpart M, and state, regional, and local standards. Sealed impermeable bags may be dumped from drums into the burial site unless bags have been broken or damaged. Damaged bags shall remain in the drum and the entire contaminated drum shall be buried. Uncontaminated drums may be recycled. Workers unloading sealed drums shall wear appropriate respirators and personal protective equipment when handling asbestos materials at the disposal site.

END OF SECTION