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USACE / NAVFAC / AFCEC / NASA	**UFGS-02 82 00 (November 2018)**
	Change 1 - 11/19

Preparing Activity: NAVFAC	**Superseding**
	UFGS 02 82 13.00 10 (February 2010)
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UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated July 2023

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SECTION 02 82 00

ASBESTOS REMEDIATION

11/18, CHG 1: 11/19

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SECTION 02 82 00

ASBESTOS REMEDIATION
11/18, CHG 1: 11/19

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NOTE: This guide specification covers the requirements for safety procedures and requirements for the demolition, removal, encapsulation, and disposal of asbestos containing materials (ACM). This specification is used in conjunction with Section 01 35 26 GOVERNMENT SAFETY REQUIREMENTS.

Adhere to UFC 1-300-02 Unified Facilities Guide Specifications (UFGS) Format Standard when editing this guide specification or preparing new project specification sections. Edit this guide specification for project specific requirements by adding, deleting, or revising text. For bracketed items, choose applicable item(s) or insert appropriate information.

Remove information and requirements not required in respective project, whether or not brackets are present.

Comments, suggestions and recommended changes for this guide specification are welcome and should be submitted as a Criteria Change Request (CCR).
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NOTE: Federal regulations require EPA model accreditation plan training to edit this document. Furthermore, asbestos abatement designers must be accredited and licensed to design asbestos work in the location of the construction.

Nonfriable asbestos containing materials do not always require special handling. However, during demolition and removal of this material dust and airborne asbestos fibers will sometimes be released. If the project contains nonfriable asbestos which may release fibers when demolished

and removed, the nonfriable asbestos must be removed in the same way as friable asbestos. Friable ACM must always be removed prior to any building demolition.

OSHA regulations address worker protection, NESHAPS (EPA) regulations address disposal requirements, and they have different definitions as to what constitutes ACM in wallboard/joint compound systems. Therefore, where wallboard/joint compound are suspected to contain ACM, analyze both discrete samples (separate samples from wallboard and joint compound) to address worker protection and composite samples (wallboard system as a whole) to address disposal requirements. It is not unusual for the wallboard itself and the wallboard system (taken as a whole) to contain less than 1 percent asbestos, but the discrete joint compound samples to contain greater than 1 percent asbestos. Problems can arise if these materials are not properly categorized in the design. Also, if the material is applied as an "add on" or "skim coat", NESHAPS considers the layers separate and composite sampling is not appropriate.

Asbestos operations do not always indicate negative pressure enclosure type asbestos control with all of its attendant requirements. The location of the area, type of material, and initial as well as other exposure assessments for abatement workers and the environment must be reviewed and a judgment made by the designer as to the precise asbestos control techniques described herein that may be safely and legally used.

It is the policy of the Navy to eliminate the use of materials containing asbestos wherever possible. Therefore, the designer must not use asbestos containing materials wherever a substitute, suitable to the Navy, exists.

The limits and conditions of asbestos hazard abatement efforts must be indicated on the drawings or in the specification in sufficient detail for the Contractor to submit an accurate bid. Portions of the building where asbestos work will take place must be unoccupied during the removal operation. It is highly recommended that the entire building be unoccupied during asbestos hazard abatement operations. If portions of the building where asbestos hazard abatement is not taking place must remain occupied, additional requirements must be added for providing temporary heating/cooling and other utilities to the occupied portions of the building. The building heating/cooling system for example cannot be operated in the asbestos control area and due to wet removal procedures, electrical service to the asbestos control area may need to be shut off and resupplied through a ground fault

circuit interrupter. In addition, the rooms with openings into the room undergoing asbestos abatement must be empty with critical barriers installed to provide a buffer zone.

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NOTE: Provide the following information on the project drawings:

1. Clearly show location, extent, condition and form of asbestos materials to be controlled or in contact with other non-ACM removals or new work.

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NOTE: The work may involve a historic property. The designer must coordinate review of the proposed work with the appropriate cultural resources manager (CRM) and cultural resource laws and regulations, as part of the environmental review and permitting process. Consultation with stakeholders, including the state historic preservation office, may be required, and work involving historic properties will likely be required to confirm to the Secretary of the Interior's Standards for the Treatment of Historic Properties (usually at the REHABILITATION level). See https://www.nps.gov/tps/standards/four-treatments/treatment-rehabilitation.h

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PART 1 GENERAL

1.1 REFERENCES

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NOTE: This paragraph is used to list the publications cited in the text of the guide specification. The publications are referred to in the text by basic designation only and listed in this paragraph by organization, designation, date, and title.

Use the Reference Wizard's Check Reference feature when you add a Reference Identifier (RID) outside of the Section's Reference Article to automatically place the reference in the Reference Article. Also use the Reference Wizard's Check Reference feature to update the issue dates.

References not used in the text will automatically be deleted from this section of the project specification when you choose to reconcile references in the publish print process.

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The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN SOCIETY OF SAFETY PROFESSIONALS (ASSP)

ASSP Z9.2	(2018) Fundamentals Governing the Design and Operation of Local Exhaust Ventilation Systems

ASTM INTERNATIONAL (ASTM)

ASTM C732	(2017; R 2022 Standard Test Method for Aging Effects of Artificial Weathering on Latex Sealants
ASTM D522/D522M	(2017) Mandrel Bend Test of Attached Organic Coatings
ASTM D2794	(1993; R 2019) Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)
ASTM D4397	(2016) Standard Specification for Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications
ASTM E84	(2023) Standard Test Method for Surface Burning Characteristics of Building Materials
ASTM E96/E96M	(2022a; E 2023) Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials
ASTM E119	(2022) Standard Test Methods for Fire Tests of Building Construction and Materials
ASTM E736/E736M	(2019) Standard Test Method for Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members
ASTM E1368	(2014) Visual Inspection of Asbestos Abatement Projects
ASTM E1494	(2012) Encapsulants for Spray- or Trowel-Applied Friable Asbestos-Containing Building Materials

COMPRESSED GAS ASSOCIATION (CGA)

CGA G-7	(2014) Compressed Air for Human Respiration; 6th Edition

INTERNATIONAL SAFETY EQUIPMENT ASSOCIATION (ISEA)

ANSI/ISEA Z87.1	(2020) Occupational and Educational Personal Eye and Face Protection Devices

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 701	(2023; ERTA 1 2023) Standard Methods of Fire Tests for Flame Propagation of Textiles and Films

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH)

NIOSH NMAM	(2016; 5th Ed) NIOSH Manual of Analytical Methods

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2014) Safety -- Safety and Health Requirements Manual

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA 340/1-90/018	(1990) Asbestos/NESHAP Regulated Asbestos Containing Materials Guidance
EPA 560/5-85-024	(1985) Guidance for Controlling Asbestos-Containing Materials in Buildings (Purple Book)

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910.147	The Control of Hazardous Energy (Lock Out/Tag Out)
29 CFR 1926.51	Sanitation
29 CFR 1926.59	Hazard Communication
29 CFR 1926.103	Respiratory Protection
29 CFR 1926.200	Accident Prevention Signs and Tags
29 CFR 1926.1101	Asbestos
40 CFR 61-SUBPART A	General Provisions
40 CFR 61-SUBPART M	National Emission Standard for Asbestos
40 CFR 763	Asbestos
42 CFR 84	Approval of Respiratory Protective Devices
49 CFR 107	Hazardous Materials Program Procedures
49 CFR 171	General Information, Regulations, and Definitions
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements
49 CFR 173	Shippers - General Requirements for

Shipments and Packagings

U.S. NAVAL FACILITIES ENGINEERING COMMAND (NAVFAC)

NAVFAC P-502	(2017) Asbestos Program Management
ND OPNAVINST 5100.23	(2005; Rev G) Navy Occupational Safety and Health (NAVOSH) Program Manual

UNDERWRITERS LABORATORIES (UL)

UL 586	(2009; Reprint Sep 2022) UL Standard for Safety High-Efficiency Particulate, Air Filter Units

1.2 DEFINITIONS

1.2.1 ACM

Asbestos Containing Materials.

1.2.2 Amended Water

Water containing a wetting agent or surfactant with a maximum surface tension of 2.9 Pa 0.00042 psi.

1.2.3 Area Sampling

Sampling of asbestos fiber concentrations which approximates the concentrations of asbestos in the theoretical breathing zone but is not actually collected in the breathing zone of an employee.

1.2.4 Asbestos

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

1.2.5 Asbestos Control Area

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

1.2.6 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.

1.2.7 Asbestos Permissible Exposure Limit

0.1 fibers per cubic centimeter of air as an 8-hour time weighted average measured in the breathing zone as defined by 29 CFR 1926.1101 or other Federal legislation having legal jurisdiction for the protection of workers health.

1.2.8 Authorized Person

Any person authorized by the Contractor and required by work duties to be present in the regulated areas.

1.2.9 Background

The ambient airborne asbestos concentration in an uncontaminated area as measured prior to any asbestos hazard abatement efforts. Background concentrations for other (contaminated) areas are measured in similar but asbestos free locations.

1.2.10 Competent Person (CP)

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NOTE: Check state requirements for licensing and edit appropriately.
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A person meeting the requirements for competent person as specified in 29 CFR 1926.1101 including a person capable of identifying existing asbestos hazards in the workplace and selecting the appropriate control strategy for asbestos exposure, who has the authority to take prompt corrective measures to eliminate them, and is specifically trained in a training course which meet the criteria of EPA's Model Accreditation Plan (40 CFR 763) for project designer or supervisor, or its equivalent.[The competent person must have a current State of [_____] asbestos contractors or supervisors license.]

1.2.11 Contractor

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

1.2.12 Disposal Bag

A 0.15 mm 6 mil thick, leak-tight plastic bag, pre-labeled in accordance with 29 CFR 1926.1101, used for transporting asbestos waste from containment to disposal site.

1.2.13 Disturbance

Activities that disrupt the matrix of ACM, crumble or pulverize ACM, or generate visible debris from ACM. Disturbance includes cutting away small amounts of ACM, no greater than the amount which can be contained in one standard sized glovebag or waste bag, not larger than 1.5 m 60 inches in length and width in order to access a building component.

1.2.14 Encapsulation

The abatement of an asbestos hazard through the appropriate use of chemical encapsulants.

1.2.15 Encapsulants

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

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

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

c. Penetrating Encapsulant (used to penetrate the asbestos containing material encapsulating all asbestos fibers and preventing fiber release due to routine mechanical damage)

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

1.2.16 Friable Asbestos Material

A term defined in 40 CFR 61-SUBPART M and EPA 340/1-90/018 meaning any material which contains more than 1 percent asbestos, as determined using the method specified in 40 CFR 763, Polarized Light Microscopy (PLM), that when dry, can be crumbled, pulverized, or reduced to powder by hand pressure.

1.2.17 Glovebag Technique

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NOTE: Verify with the State regulations that glovebag removal is an acceptable technique.

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Those asbestos removal and control techniques put forth in 29 CFR 1926.1101.

1.2.18 Government Consultant (GC)

That qualified person employed directly by the Government to monitor, sample, inspect the work or in some other way advise the Contracting Officer. The GC is normally a private consultant, but can be an employee of the Government.

1.2.19 HEPA Filter Equipment

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

1.2.20 Model Accreditation Plan (MAP)

USEPA training accreditation requirements for persons who work with asbestos as specified in 40 CFR 763.

1.2.21 Negative Pressure Enclosure (NPE)

That engineering control technique described as a negative pressure enclosure in 29 CFR 1926.1101.

1.2.22 NESHAP

National Emission Standards for Hazardous Air Pollutants. The USEPA NESHAP regulation for asbestos is at 40 CFR 61-SUBPART M.

1.2.23 Nonfriable Asbestos Material

Material that contains asbestos in which the fibers have been immobilized 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 may be released under other conditions such as demolition, removal, or mishap.

1.2.24 Permissible Exposure Limits (PELs)

1.2.24.1 PEL-Time Weighted Average(TWA)

Concentration of asbestos not in excess of 0.1 fibers per cubic centimeter of air (f/cc) as an 8-hour time weighted average (TWA).

1.2.24.2 PEL-Excursion Limit

An airborne concentration of asbestos not in excess of 1.0 f/cc of air as averaged over a sampling period of 30 minutes.

1.2.25 Personal Sampling

Air sampling which is performed to determine asbestos fiber concentrations within the breathing zone of a specific employee, as performed in accordance with 29 CFR 1926.1101.

1.2.26 Private Qualified Person (PQP)

That qualified person hired by the Contractor to perform the herein listed tasks.

1.2.27 Qualified Person (QP)

A Registered Architect, Professional Engineer, Certified Industrial Hygienist, consultant or other qualified person who has successfully completed training and is therefore accredited under a legitimate State Model Accreditation Plan as described in 40 CFR 763 as a Building Inspector, Contractor/Supervisor Abatement Worker, and Asbestos Project Designer; and has successfully completed the National Institute of Occupational Safety and Health (NIOSH) 582 course "Sampling and Evaluating Airborne Asbestos Dust" or equivalent. The QP must be qualified to perform visual inspections as indicated in ASTM E1368.[The QP must be appropriately licensed in the State of [_____].]

1.2.28 TEM

Refers to Transmission Electron Microscopy.

1.2.29 Time Weighted Average (TWA)

The TWA is an 8-hour time weighted average airborne concentration of asbestos fibers.

1.2.30 Transite

A generic name for asbestos cement wallboard and pipe.

1.2.31 Wetting Agent

A chemical added to water to reduce the water's surface tension thereby increasing the water's ability to soak into the material to which it is applied. An equivalent wetting agent must have a surface tension of at most 2.9 Pa 0.00042 psi.

1.2.32 Worker

Individual (not designated as the Competent Person or a supervisor) who performs asbestos work and has completed asbestos worker training required by 29 CFR 1926.1101, to include EPA Model Accreditation Plan (MAP) "Worker" training; accreditation, if required by the OSHA Class of work to be performed or by the state where the work is to be performed.[The worker must be appropriately licensed in the State of [_____].]

1.3 REQUIREMENTS

1.3.1 Description of Work

****
NOTE: Specify the form, condition and approximate quantity square meters or linear meters square feet or linear feet of asbestos material to be controlled in the first blank and the location of the material in the second blank. Example: "The asbestos work includes the demolition and removal of 90 m of 200 mm 300 feet of 8 inch diameter asbestos insulation located on existing steam piping indicated to be removed in the boiler room." or "The asbestos work includes the encapsulation of 270 square meters 3,000 square feet of sprayed on asbestos containing fire proofing materials located above the ceiling throughout the structure."

The use of this section in the contract specification means that known asbestos material is involved. Estimate the quantity and specify as unit price items in Section 00 21 13, INSTRUCTIONS TO BIDDERS or Section 01 20 00 Price and Payment Procedures per standard practice of the activity preparing the contract.
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NOTE: Include reference to 40 CFR 763 when asbestos work occurs in a public or private school Grades K thru 12.
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NOTE: Nonfriable ACM may not require special handling. However, during demolition and removal of this material dust and airborne asbestos fibers will sometimes be released. If the project contains nonfriable asbestos which may release fibers when demolished and removed, the nonfriable asbestos must be removed in the same way as friable asbestos. Include "Under normal.... specified herein.", if

material traditionally defined as non-friable asbestos materials are to be removed.
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NOTE: The appropriate engineering control technique must comply with the requirements outlined in 29 CFR 1926.1101 which is selected based on existing conditions, but must be that technique that provides the best control during abatement at most reasonable cost.
****

The work covered by this section includes the handling and control of asbestos containing materials and describes some of the resultant procedures and equipment required to protect workers, the environment and occupants of the building or area, or both, from contact with airborne asbestos fibers. The work also includes the disposal of any asbestos containing materials generated by the work. More specific operational procedures must be outlined in the Asbestos Hazard Abatement Plan called for elsewhere in this specification. The asbestos work includes the [demolition and removal][encapsulation] of [_____] located [_____] [which is governed by 40 CFR 763 and NAVFAC P-502].[Under normal conditions non-friable or chemically bound materials containing asbestos would not be considered hazardous; however, this material may release airborne asbestos fibers during demolition and removal and therefore must be handled in accordance with the removal and disposal procedures as specified herein.] Provide [negative pressure enclosure] [_____] techniques as outlined in this specification. The [building][work area] will be evacuated during the asbestos abatement work. A competent person must supervise asbestos removal work as specified herein.

1.3.1.1 Wallboard/Joint Compound

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NOTE: When both composite and discrete sampling and testing is done on wallboard/joint compound, include and edit the following to address the site specific situation:
****

[Both composite samples of the wallboard and discrete samples of the components (wallboard and joint compound) have been tested and results are attached.

][Composite samples of the wallboard system were tested and found to contain [less than one percent asbestos] [_____]. Discrete samples of the wallboard were tested and found to contain [less than one percent asbestos] [_____]. Discrete samples of the joint compound were tested and found to contain [greater than one percent asbestos] [_____].

]1.3.2 Unexpected Discovery of Asbestos

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NOTE: Discovery of Unexpected Asbestos: Suspect asbestos containing material that is discovered during demolition (in particular buildings constructed no later than 1980), which was previously inaccessible, must be sampled and

analyzed for its asbestos content. The Designer should anticipate additional sampling and analysis. The Designer should provide Unit Price options in the Bid Form. Coordinate with the Designer of Record. The number of additional samples should be based on the extent of demolition and previous survey data. Sampling activities undertaken to determine the presence of additional ACM should be conducted by personnel who have successfully completed the EPA Model Accreditation (MAP) training course and have EPA/State certification/license as an Asbestos Inspector.

****

Notify the Contracting Officer if any previously untested building components suspected to contain asbestos are impacted by the work.

1.3.3 Medical Requirements

Provide medical requirements including but not limited to medical surveillance and medical record keeping as listed in 29 CFR 1926.1101.

1.3.3.1 Medical Examinations

Before exposure to airborne asbestos fibers, provide workers with a comprehensive medical examination as required by 29 CFR 1926.1101 or other pertinent State or local directives. This requirement must have been satisfied within the 12 months prior to the start of work on this contract. The same medical examination must 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."

1.3.3.2 Medical Records

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NOTE: Medical records must be retained at least 50 years. Some States require longer retention periods. Check with the State in which the project is located for the required retention time.

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Maintain complete and accurate records of employees' medical examinations, medical records, and exposure data for a period of [50 years][indefinite time] after termination of employment and make records of the required medical examinations and exposure data available for inspection and copying to: The Assistant Secretary of Labor for Occupational Safety and Health (OSHA), or authorized representatives of them, and an employee's physician upon the request of the employee or former employee.

1.3.4 Employee Training

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NOTE: Include bracketed sentence where required by law, regulation or statute.

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Submit certificates, prior to the start of work but after the main abatement submittal, signed by each employee indicating that the employee has received training in the proper handling of materials and wastes that contain asbestos in accordance with 40 CFR 763; understands the health implications and risks involved, including the illnesses possible from exposure to airborne asbestos fibers; understands the use and limits of the respiratory equipment to be used; and understands the results of monitoring of airborne quantities of asbestos as related to health and respiratory equipment as indicated in 29 CFR 1926.1101 on an initial and annual basis. Organize certificates by individual worker, not grouped by type of certification.[Post appropriate evidence of compliance with the training requirements of 40 CFR 763.] Train personnel involved in the asbestos control work in accordance with United States Environmental Protection Agency (USEPA) Asbestos Hazard Emergency Response Act (AHERA) training criteria or State training criteria whichever is more stringent. Document the training by providing: dates of training, training entity, course outline, names of instructors, and qualifications of instructors upon request by the Contracting Officer. Furnish each employee with respirator training and fit testing administered by the PQP as required by 29 CFR 1926.1101 and 29 CFR 1926.103. Fully cover engineering and other hazard control techniques and procedures.[Asbestos workers must have a current State of [_____] asbestos worker's license.]

1.3.5 Permits[, Licenses,] and Notifications

****

NOTE: The USEPA has delegated the responsibility of notification requirements to most States. Verify with the State and local authorities where the project is located whether the city, county, State, or USEPA has jurisdiction and whether a license is required.

Verify the specific notification requirements for the state where the work is being performed.

****

Prior to the start of work, obtain necessary permits[and licenses] in conjunction with asbestos removal, encapsulation, hauling, and disposition, and furnish notification of such actions required by Federal, State, regional, and local authorities. Notify the [Regional Office of the United States Environmental Protection Agency (USEPA)][State's environmental protection agency][local air pollution control district/agency] and the Contracting Officer in writing [10] [20] [_____] working days prior to commencement of work in accordance with 40 CFR 61-SUBPART M[and [_____]]. Notify the Contracting Officer and other appropriate Government agencies in writing 20 working days prior to the start of asbestos work as indicated in applicable laws, ordinances, criteria, rules, and regulations. Submit copies of all Notifications to the Contracting Officer.[Notify the local fire department 3 days prior to removing fire-proofing material from the building including notice that the material contains asbestos.]

1.3.6 Environment, Safety and Health Compliance

****

NOTE: The designer must research the State, regional and local laws, regulations, statutes, and list by authority and document number in the blank

spaces provided those which apply to the asbestos work to be performed by the Contractor.
****

In addition to detailed requirements of this specification, comply with those applicable laws, ordinances, criteria, rules, and regulations of Federal, State, regional, and local authorities regarding handling, storing, transporting, and disposing of asbestos waste materials. Comply with the applicable requirements of the current issue of EM 385-1-1, 29 CFR 1926.1101, 40 CFR 61-SUBPART A, 40 CFR 61-SUBPART M, 40 CFR 763 and ND OPNAVINST 5100.23. Submit matters of interpretation of standards to the appropriate administrative agency for resolution before starting the work. Where the requirements of this specification, applicable laws, rules, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirement as defined by the Government apply. The following laws, ordinances, criteria, rules and regulations regarding removal, handling, storing, transporting and disposing of asbestos materials apply:

a. [_____]

b. [_____]

c. [_____].

1.3.7 Respiratory Protection Program

Establish and implement a respirator program as required by 29 CFR 1926.1101, and 29 CFR 1926.103. Submit a written description of the program to the Contracting Officer. Submit a written program manual or operating procedure including methods of compliance with regulatory statutes.

1.3.7.1 Respirator Program Records

Submit records of the respirator program as required by 29 CFR 1926.103, and 29 CFR 1926.1101.

1.3.7.2 Respirator Fit Testing

The Contractor's PQP must conduct a qualitative or quantitative fit test conforming to 29 CFR 1926.103 for each worker required to wear a respirator, and any authorized visitors who enter a regulated area where respirators are required to be worn. A respirator fit test must be performed prior to initially wearing a respirator and every 12 months thereafter. If physical changes develop that will affect the fit, a new fit test must be performed. Functional fit checks must be performed each time a respirator is put on and in accordance with the manufacturer's recommendation.

1.3.7.3 Respirator Selection and Use Requirements

Provide respirators, and ensure that they are used as required by 29 CFR 1926.1101 and in accordance with CGA G-7 and the manufacturer's recommendations. Respirators must be approved by the National Institute for Occupational Safety and Health NIOSH, under the provisions of 42 CFR 84, for use in environments containing airborne asbestos fibers. For air-purifying respirators, the particulate filter must be high-efficiency particulate air (HEPA)/(N-,R-,P-100). The initial respirator selection

and the decisions regarding the upgrading or downgrading of respirator type must be made by the Contractor's Designated IH based on the measured or anticipated airborne asbestos fiber concentrations to be encountered.

1.3.8 Asbestos Hazard Control Supervisor

The Contractor must be represented on site by a supervisor, trained using the model Contractor accreditation plan as indicated in the Federal statutes for all portions of the herein listed work.

1.3.9 Hazard Communication

Adhere to all parts of 29 CFR 1926.59 and provide the Contracting Officer with a copy of the Safety Data Sheets (SDS) for all materials brought to the site.

1.3.10 Asbestos Hazard Abatement Plan

Submit a detailed plan of the safety precautions such as lockout, tagout, tryout, fall protection, and confined space entry procedures and equipment and work procedures to be used in the [encapsulation] [removal] [and demolition] of materials containing asbestos. The plan, not to be combined with other hazard abatement plans, must be prepared, signed, and sealed by the PQP. Provide a Table of Contents for each abatement submittal, which follows the sequence of requirements in the contract. The plan must include but not be limited to the precise personal protective equipment to be used including, but not limited to, respiratory protection, type of whole-body protection[and if reusable coveralls are to be employed decontamination methods (operations and quality control plan)], the location of asbestos control areas including clean and dirty areas, buffer zones, showers, storage areas, change rooms, [removal] [encapsulation] method, interface of trades involved in the construction, sequencing of asbestos related work, disposal plan, type of wetting agent and asbestos sealer to be used, locations of local exhaust equipment, planned air monitoring strategies, and a detailed description of the method to be employed in order to control environmental pollution. The plan must also include (both fire and medical emergency) response plans and an Activity Hazard Analyses (AHAs) in accordance with EM 385-1-1. The Asbestos Hazard Abatement Plan must be approved in writing prior to starting any asbestos work. The Contractor, Asbestos Hazard Control Supervisor,, CP and PQP must meet with the Contracting Officer prior to beginning work, to discuss in detail the Asbestos Hazard Abatement Plan, including work procedures and safety precautions. Once approved by the Contracting Officer, the plan will be enforced as if an addition to the specification. Any changes required in the specification as a result of the plan must be identified specifically in the plan to allow for free discussion and approval by the Contracting Officer prior to starting work.

1.3.11 Testing Laboratory

Submit the name, address, and telephone number of each testing laboratory selected for the[sampling,] analysis, and reporting of airborne concentrations of asbestos fibers along with[evidence that each laboratory selected holds the appropriate State license and permits and] certification that each laboratory is American Industrial Hygiene Association (AIHA) accredited and that persons counting the samples have been judged proficient by current inclusion on the AIHA Asbestos Analysis Registry (AAR) and successful participation of the laboratory in the Proficiency Analytical Testing (PAT) Program. Where analysis to determine

asbestos content in bulk materials or transmission electron microscopy is required, submit evidence that the laboratory is accredited by the National Institute of Science and Technology (NIST) under National Voluntary Laboratory Accreditation Program (NVLAP) for asbestos analysis. The testing laboratory firm must be independent of the asbestos contractor and must have no employee or employer relationship which could constitute a conflict of interest.

1.3.12 Landfill Approval

****

NOTE: The USEPA has delegated the responsibility of approving landfills for the disposal of asbestos to most States. Verify with the State in which the project is located whether the State or USEPA has jurisdiction and what laws apply.

****

Submit written evidence that the landfill is approved for asbestos disposal by the U.S. Environmental Protection Agency, Region [3][_____], Air Enforcement Section [(38W12)][_____], and local regulatory agencies. Within three working days after delivery, submit detailed delivery tickets, prepared, signed, and dated by an agent of the landfill, certifying the amount of asbestos materials delivered to the landfill. Submit a copy of the waste shipment records within one day of the shipment leaving the project site.

1.3.13 Transporter Certification

****

NOTE: Designer should utilize and reference, where appropriate, Section 02 81 00 TRANSPORTATION AND DISPOSAL OF HAZARDOUS MATERIALS as a part of the contract documents or include the appropriate Department of Transportation (DOT) requirements from 49 CFR 107, 171, 172, and 173. If Section 02 81 00 is not included, edit this paragraph to include the DOT references. The contract documents must address all applicable DOT requirements including those for shipping, training, certifications, packaging, markings, labelings, and placards for shippers and transporters in addition to Government, OSHA and EPA requirements.

****

Submit written evidence that the transporter is approved to transport asbestos waste in accordance with the DOT requirements of 49 CFR 171, 49 CFR 172 and 49 CFR 173 as well as registration requirements of 49 CFR 107 and all other State and local regulatory agency requirements.

1.3.14 Medical Certification

Provide a written certification for each worker and supervisor, signed by a licensed physician indicating that the worker and supervisor has met or exceeded all of the medical prerequisites listed herein and in 29 CFR 1926.1101 and 29 CFR 1926.103 as prescribed by law. Submit certificates prior to the start of work but after the main abatement submittal.

1.4 SUBMITTALS

****

NOTE: Review Submittal Description (SD) definitions in Section 01 33 00 SUBMITTAL PROCEDURES and edit the following list, and corresponding submittal items in the text, to reflect only the submittals required for the project. The Guide Specification technical editors have classified those items that require Government approval, due to their complexity or criticality, with a "G." Generally, other submittal items can be reviewed by the Contractor's Quality Control System. Only add a "G" to an item if the submittal is sufficiently important or complex in context of the project.

For Army projects, fill in the empty brackets following the "G" classification, with a code of up to three characters to indicate the approving authority. Codes for Army projects using the Resident Management System (RMS) are: "AE" for Architect-Engineer; "DO" for District Office (Engineering Division or other organization in the District Office); "AO" for Area Office; "RO" for Resident Office; and "PO" for Project Office. Codes following the "G" typically are not used for Navy, Air Force, and NASA projects.

The "S" classification indicates submittals required as proof of compliance for sustainability Guiding Principles Validation or Third Party Certification and as described in Section 01 33 00 SUBMITTAL PROCEDURES.

Choose the first bracketed item for Navy, Air Force, and NASA projects, or choose the second bracketed item for Army projects.

****

Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are [for Contractor Quality Control approval.][for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government.] Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

****

NOTE: The submittals required for each project are very dependent upon the removal method to be used. Edit the submittals paragraph accordingly.

****

SD-03 Product Data

Amended Water; G[, [_____]]

Safety Data Sheets (SDS) for All Materials; G[, [_____]]

Encapsulants; G[, [_____]]

Respirators; G[, [_____]]

Local Exhaust Equipment; G[, [_____]]

Pressure Differential Automatic Recording Instrument; G[, [_____]]

Vacuums; G[, [_____]]

[Glovebags; G[, [_____]]

] SD-06 Test Reports

Air Sampling Results; G[, [_____]]

Pressure Differential Recordings for Local Exhaust System; G[, [_____]]

[Encapsulation Test Patches; G[, [_____]]

] Clearance Sampling; G[, [_____]]

Asbestos Disposal Quantity Report; G[, [_____]]

SD-07 Certificates

****
NOTE: Verify and include contractor's and worker's licenses as required for the state where the work is being performed.
****

Employee Training; G[, [_____]]

Notifications; G[, [_____]]

Respiratory Protection Program; G[, [_____]]

Asbestos Hazard Abatement Plan; G[, [_____]]

Testing Laboratory; G[, [_____]]

Landfill Approval; G[, [_____]]

Delivery Tickets; G[, [_____]]

Waste Shipment Records; G[, [_____]]

Transporter Certification; G[, [_____]]

Medical Certification; G[, [_____]]

Private Qualified Person Documentation; G[, [_____]]

Designated Competent Person; G[, [_____]]

Worker's License; G[, [_____]]

Contractor's License; G[, [_____]]

Federal, State or Local Citations on Previous Projects; G[, [_____]]

Encapsulants; G[, [_____]]

Equipment Used to Contain Airborne Asbestos Fibers; G[, [_____]]

Water Filtration Equipment; G[, [_____]]

Vacuums; G[, [_____]]

Ventilation Systems; G[, [_____]]

SD-11 Closeout Submittals

Permits[and Licenses]; G[, [_____]]

Notifications; G[, [_____]]

Respirator Program Records; G[, [_____]]

[Protective Clothing Decontamination Quality Control Records; G[, [_____]]

][Protective Clothing Decontamination Facility Notification; G[, [_____]]

] Rental Equipment; G[, [_____]]

1.5 QUALITY ASSURANCE

1.5.1 Private Qualified Person Documentation

****
NOTE: Edit requirement for private qualified person to have licensing.
****

Submit the name, address, and telephone number of the Private Qualified Person (PQP) selected to prepare the Asbestos Hazard Abatement Plan, direct monitoring and training, and documented evidence that the PQP has successfully completed training in and is accredited and where required is certified as, a Building Inspector, Contractor/Supervisor Abatement Worker, and Asbestos Project Designer as described by 40 CFR 763 and has successfully completed the National Institute of Occupational Safety and Health (NIOSH) 582 course "Sampling and Evaluating Airborne Asbestos Dust" or equivalent.[The PQP must be appropriately licensed in the State of [_____] as a Project Monitor]. The PQP and the asbestos contractor must not have an employee/employer relationship or financial relationship which could constitute a conflict of interest. The PQP must be a first tier subcontractor.

1.5.2 Designated Competent Person Documentation

****
NOTE: Edit requirement for licensing.
****

The Designated Competent Person must be experienced in the administration

and supervision of asbestos abatement projects including exposure assessment and monitoring, work practices, abatement methods, protective measures for personnel, setting up and inspecting asbestos abatement work areas, evaluating the integrity of containment barriers, placement and operation of local exhaust systems, ACM generated waste containment and disposal procedures, decontamination units installation and maintenance requirements, site safety and health requirements, notification of other employees onsite, [_____]. The Designated Competent Person must be on-site at all times when asbestos abatement activities are underway.Submit training certification and a current State of [_____] Asbestos Contractor's and Supervisor's License. Submit evidence that the Designated Competent Person has a minimum of [2] [_____] years of on-the-job asbestos abatement experience relevant to OSHA designated competent person requirements. The Designated Competent Person must be a first tier subcontractor.

1.5.3 Worker's License

****
NOTE: Edit requirement for licensing.
****

Submit documentation that workers meet the requirements of 29 CFR 1926.1101, 40 CFR 61-SUBPART M and have a current State of [_____] Asbestos Workers License.

1.5.4 Contractor's License

****
NOTE: Edit requirement for licensing.
****

Submit a copy of the asbestos contractor's license issued by the State of [_____]. Submit the following certification along with the license: "I certify that the personnel I am responsible for during the course of this project fully understand the contents of 29 CFR 1926.1101, 40 CFR 61-SUBPART MEM 385-1-1, and the Federal, State and local requirements for those asbestos abatement activities that they will be involved in." This certification statement must be signed by the Company's President or Chief Executive.

1.5.5 Air Sampling Results

****
NOTE: Normal practice is to have the Contractor hire one independent Private Qualified Person (the PQP) to perform all required functions. However, some applicable laws forbid this approach and will dictate when the PQP, the GC or both will be required to perform the function involved. However, the Contractor must always hire a PQP.
****

Complete fiber counting and provide results to the [PQP][and][GC] for review within 16 hours of the "time off" of the sample pump. Notify the Contracting Officer immediately of any airborne levels of asbestos fibers in excess of the acceptable limits. Submit sampling results to the Contracting Officer and the affected Contractor employees where required by law within three working days, signed by the testing laboratory

employee performing air sampling, the employee that analyzed the sample, and the [PQP][and][GC]. Notify the Contractor and the Contracting Officer 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 or background whichever is higher. In no circumstance must levels exceed 0.1 fibers per cubic centimeter.

1.5.6 Pressure Differential Recordings for Local Exhaust System

****

NOTE: When an negative pressure enclosure is not required, delete the requirements for the local exhaust system and pressure differential recording.

****

****

NOTE: Normal practice is to have the Contractor hire one independent Private Qualified Person (the PQP) to perform all required functions. However, some applicable laws forbid this approach and will dictate when the PQP, the GC or both will be required to perform the function involved. However, the Contractor must always hire a PQP.

****

Provide a local exhaust system that creates a negative pressure of at least 0.51 mm 0.02 inches of water relative to the pressure external to the enclosure and operate it continuously, 24-hours a day, until the temporary enclosure of the asbestos control area is removed. Submit pressure differential recordings for each work day to the [PQP][and][GC] for review and to the Contracting Officer within 24-hours from the end of each work day.

[1.5.7 Protective Clothing Decontamination Quality Control Records

Provide all records that document quality control for the decontamination of reusable outer protective clothing.

][1.5.8 Protective Clothing Decontamination Facility Notification

Submit written evidence that persons who decontaminate, store, or transport asbestos contaminated clothing used in the performance of this contract were duly notified in accordance with 29 CFR 1926.1101.

]1.5.9 Federal, State or Local Citations on Previous Projects

Submit a statement, signed by an officer of the company, containing a record of any citations issued by Federal, State or local regulatory agencies relating to asbestos activities within the last 5 years (including projects, dates, and resolutions); a list of penalties incurred through non-compliance with asbestos project specifications, including liquidated damages, overruns in scheduled time limitations and resolutions; and situations in which an asbestos-related contract has been terminated (including projects, dates, and reasons for terminations). If there are none, a negative declaration signed by an officer of the company must be provided.

1.5.10 Preconstruction Conference

****

NOTE: Specify additional or modified requirements to be addressed in the preconstruction safety conference within the bracket if different from that described. Confer with the appropriate Construction Office and Safety and Occupational Health Office representatives to make this determination. For Army projects refer to EP 415-1-260, Chapter 9, Resident Engineers Management Guide. If this conference is addressed in another specification section, reference the appropriate section.

****

Conduct a safety preconstruction conference to discuss the details of the Asbestos Hazard Abatement Plan, Accident Prevention Plan (APP) including the AHAs required in specification Section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS [_____]. The safety preconstruction conference must include the Contractor and their Designated Competent Person, Designated IH and Project Supervisor and the Contracting Officer. Deficiencies in the APP will be discussed. Onsite work must not begin until the APP has been accepted. [_____]

1.6 SECURITY

****

NOTE: Specify onsite security requirements to be provided. Confer with the customer and the Contracting Officer for additional requirements.

****

[[_____] must be provided for each regulated area.]A log book must be kept documenting entry into and out of the regulated area. Entry into regulated areas must only be by personnel authorized by the Contractor and the Contracting Officer. Personnel authorized to enter regulated areas must be trained, medically evaluated, and wear the required personal protective equipment.

1.7 EQUIPMENT

1.7.1 Rental Equipment

Provide a copy of the written notification to the rental company concerning the intended use of the equipment and the possibility of asbestos contamination of the equipment.

PART 2 PRODUCTS

2.1 ENCAPSULANTS

Encapsulants must conform to current USEPA requirements, contain no toxic or hazardous substances as defined in 29 CFR 1926.59, and conform to the following performance requirements.

2.1.1 Removal Encapsulants

Requirement	Test Standard
Flame Spread - 25, Smoke Emission - 50	ASTM E84
Life Expectancy - 20 years	ASTM C732 Accelerated Aging Test
Permeability - Minimum 0.4 perms	ASTM E96/E96M
Fire Resistance - Negligible affect on fire resistance rating over 3 hour test (Classified by UL for use over fibrous and cementitious sprayed fireproofing)	ASTM E119
Impact Resistance - Minimum 245.5 mm/N 43 in/lb	ASTM D2794 Gardner Impact Test
Flexibility - no rupture or cracking	ASTM D522/D522M Mandrel Bend Test

2.1.2 Bridging Encapsulant

Requirement	Test Standard
Flame Spread - 25, Smoke Emission - 50	ASTM E84
Life Expectancy - 20 years	ASTM C732 Accelerated Aging Test
Permeability - Minimum 0.4 perms	ASTM E96/E96M
Fire Resistance - Negligible affect on fire resistance rating over 3-hour test (Classified by UL for use over fibrous and cementitious sprayed fireproofing)	ASTM E119
Impact Resistance - Minimum 245.5 mm/N 43 in/lb	ASTM D2794 Gardner Impact Test
Flexibility - no rupture or cracking	ASTM D522/D522M Mandrel Bend Test

2.1.3 Penetrating Encapsulant

Requirement	Test Standard
Flame Spread - 25, Smoke Emission - 50	ASTM E84

Requirement	Test Standard
Life Expectancy - 20 years	ASTM C732 Accelerated Aging Test
Permeability - Minimum 0.4 perms	ASTM E96/E96M
Cohesion/Adhesion Test - 729.5 N of force/meter 50 pounds of force/foot	ASTM E119
Fire Resistance - Negligible affect on fire resistance rating over 3-hour test (Classified by UL for use over fibrous and cementitious sprayed fireproofing)	ASTM E119
Impact Resistance - Minimum 245.5 mm/N 43 in/lb	ASTM D2794 Gardner Impact Test
Flexibility - no rupture or cracking	ASTM D522/D522M Mandrel Bend Test

2.1.4 Lock-down Encapsulant

Requirement	Test Standard
Flame Spread - 25, Smoke Emission - 50	ASTM E84
Life Expectancy - 20 years	ASTM C732 Accelerated Aging Test
Permeability - Minimum 0.4 perms	ASTM E96/E96M
Fire Resistance - Negligible affect on fire resistance rating over 3-hour test (Tested with fireproofing over encapsulant applied directly to steel member)	ASTM E119
Bond Strength: 1459 N of force/meter 100 pounds of force/foot	ASTM E736/E736M
(Tests compatibility with cementitious and fibrous fireproofing)	

[2.2 ENCASEMENT PRODUCTS

****

NOTE: This technique is not used often. Before specifying, consult state requirements and ensure

that the materials, use requirements and warranties are fully developed with the customer.
****

Encasement must consist of primary cellular polymer coat, polymer finish coat, and any other finish coat as approved by the Contracting Officer.

]2.3 DUCT TAPE

Industrial grade duct tape of appropriate widths suitable for bonding sheet plastic and disposal container.

2.4 DISPOSAL CONTAINERS

****
NOTE: Consult customer, federal, state, and local requirements for the type of disposal container allowed.
****

Leak-tight (defined as solids, liquids, or dust that cannot escape or spill out) disposal containers must be provided for ACM wastes as required by 29 CFR 1926.1101. Disposal containers can be in the form of:

a. Disposal Bags

b. Fiberboard Drums

c. Cardboard Boxes

2.5 SHEET PLASTIC

****
NOTE: Consult customer, federal, state and local requirements. If necessary, specify the type of sheet to be used and select the color and surface treatment.
****

Sheet plastic must be polyethylene of 0.15 mm 6 mil minimum thickness and must be provided in the largest sheet size necessary to minimize seams. Film must be [clear][frosted][or][black] and conform to ASTM D4397, except as specified below

2.5.1 Flame Resistant

Where a potential for fire exists, flame-resistant sheets must be provided. Film must be [frosted][or][black] and must conform to the requirements of NFPA 701.

2.5.2 Reinforced

Reinforced sheets must be provided where high skin strength is required, such as where it constitutes the only barrier between the regulated area and the outdoor environment. The sheet stock must consist of translucent, nylon-reinforced or woven-polyethylene thread laminated between 2 layers of polyethylene film. Film must meet flame resistant standards of NFPA 701.

2.6 MASTIC REMOVING SOLVENT

Mastic removing solvent must be nonflammable and must not contain methylene chloride, glycol ether, or halogenated hydrocarbons. Solvents used onsite must have a flash point greater than 60 degrees C 140 degrees F.

2.7 LEAK-TIGHT WRAPPING

Two layers of 0.15 mm 6 mil minimum thick polyethylene sheet stock must be used for the containment of removed asbestos-containing components or materials such as large tanks, boilers, insulated pipe segments and other materials. Upon placement of the ACM component or material, each layer must be individually leak-tight sealed with duct tape.

2.8 VIEWING INSPECTION WINDOW

Where feasible, a minimum of one clear, 3 mm 1/8 inch thick, acrylic sheet, 450 by 610 mm 18 by 24 inches, must be installed as a viewing inspection window at eye level on a wall in each containment enclosure. The windows must be sealed leak-tight with industrial grade duct tape.

2.9 WETTING AGENTS

****

NOTE: Review the abatement methods to be employed and edit the paragraph accordingly.

****

Removal encapsulant (a penetrating encapsulant) must be provided when conducting removal abatement activities that require a longer removal time or are subject to rapid evaporation of amended water. The removal encapsulant must be capable of wetting the ACM and retarding fiber release during disturbance of the ACM greater than or equal to that provided by amended water. Performance requirements for penetrating encapsulants are specified in paragraph ENCAPSULANTS above.

PART 3 EXECUTION

3.1 EQUIPMENT

****

NOTE: Modify the number of sets of protective equipment as required, depending on the size of the asbestos removal project. Larger projects may require more than two persons on an inspection team.

****

Provide the Contracting Officer or the Contracting Officer's Representative, with at least [two] [_____] complete sets of personal protective equipment [including decontaminating reusable coveralls]as required for entry to and inspection of the asbestos control area. Provide equivalent training to the Contracting Officer or a designated representative as provided to Contractor employees in the use of the required personal protective equipment. Provide manufacturer's certificate of compliance for all equipment used to contain airborne asbestos fibers.

3.1.1 Air Monitoring Equipment

The Contractor's PQP must approve air monitoring equipment. The equipment must include, but must not be limited to:

a. High-volume sampling pumps that can be calibrated and operated at a constant airflow up to 16 liters per minute.

b. Low-volume, battery powered, body-attachable, portable personal pumps that can be calibrated to a constant airflow up to approximately 3.5 liters per minute, and a self-contained rechargeable power pack capable of sustaining the calibrated flow rate for a minimum of 10 hours. The pumps must also be equipped with an automatic flow control unit which must maintain a constant flow, even as filter resistance increases due to accumulation of fiber and debris on the filter surface.

c. Single use standard 25 mm diameter cassette, open face, 0.8 micron pore size, mixed cellulose ester membrane filters and cassettes with 50 mm electrically conductive extension cowl, and shrink bands for personal air sampling.

[d. Single use standard 25 mm diameter cassette, open face, 0.45 micron pore size, mixed cellulose ester membrane filters and cassettes with 50 mm electrically conductive cowl, and shrink bands when conducting environmental area sampling using NIOSH NMAM Methods 7400 and 7402, (and the transmission electric microscopy method specified at 40 CFR 763 if required).

] e. A flow calibrator capable of calibration to within plus or minus 2 percent of reading over a temperature range of minus 20 to plus 60 degrees C minus 4 to plus 140 degrees F and traceable to a NIST primary standard.

3.1.2 Respirators

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

3.1.2.1 Respirators for Handling Asbestos

Provide personnel engaged in pre-cleaning, cleanup, handling, [encapsulation][removal][and][or][demolition] of asbestos materials with respiratory protection as indicated in 29 CFR 1926.1101 and 29 CFR 1926.103. Breathing air must comply with CGA G-7.

3.1.3 Exterior Whole Body Protection

3.1.3.1 Outer Protective Clothing

Provide personnel exposed to asbestos with disposable "non-breathable,"[or reusable "non-breathable"] whole body outer 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 must not be used alone. Make sleeves secure at the wrists, make foot coverings secure at the ankles, and make clothing secure at the neck by the use of tape.[Reusable whole body outer protective clothing must be either disposed of as asbestos

contaminated waste upon exiting from the asbestos regulated work area or be properly decontaminated.]

3.1.3.2 Work Clothing

Provide cloth work clothes for wear under the outer protective clothing and foot coverings and either dispose of or properly decontaminate them as recommended by the [GC][PQP] after each use.

3.1.3.3 Personal Decontamination Unit

Provide a temporary, negative pressure unit with a separate decontamination locker room and clean locker room with a shower that complies with 29 CFR 1926.51(f)(4)(ii) through (V) in between for personnel required to wear whole body protective clothing. Provide two separate lockers for each asbestos worker, one in each locker room. Keep street clothing and street shoes in the clean locker. 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.[HEPA vacuum and remove asbestos contaminated reusable protective clothing while still wearing respirators at the boundary of the asbestos work area, seal in two impermeable bags, label outer bag as asbestos contaminated waste, and transport for decontamination.] Do not wear work clothing between home and work. Locate showers between the decontamination locker room and the clean locker room and require that all employees shower before changing into street clothes. Collect used shower water and filter with approved water filtration equipment to remove asbestos contamination. Wastewater filters must be installed in series with the first stage pore size [20] [_____] microns and the second stage pore size of [5] [_____] microns. Dispose of filters and residue as asbestos waste. Discharge clean water to the sanitary system. Dispose of asbestos contaminated work clothing as asbestos contaminated waste[or properly decontaminate as specified in the Contractor's Asbestos Hazard Abatement Plan]. Keep the floor of the decontamination unit's clean room dry and clean at all times. Proper housekeeping and hygiene requirements must be maintained. Provide soap and towels for showering, washing and drying. Cloth towels provided must be disposed of as ACM waste or must be laundered in accordance with 29 CFR 1926.1101. Physically attach the decontamination units to the asbestos control area. Construct both a personnel decontamination unit and an equipment decontamination unit onto and integral with each asbestos control area.

[3.1.3.4 Decontamination of Reusable Outer Protective Clothing

When reusable outer protective clothing is used, transport the double bagged clothing to a previously notified commercial/industrial decontamination facility for decontamination. Perform non-destructive testing to determine the effectiveness of asbestos decontamination. If representative sampling is used, ensure the statistical validity of the sampling results. If representative sampling is used, reject any entire batch in which any of the pieces exceed 40 fibers per square millimeter. Inspect reusable protective clothing prior to use to ensure that it will provide adequate protection and is not or is not about to become ripped, torn, deteriorated, or damaged, and that it is not visibly contaminated. Notify, in writing, all personnel involved in the decontamination of reusable outer protective clothing as indicated in 29 CFR 1926.1101.

]3.1.3.5 Eye Protection

Provide eye protection that complies with ANSI/ISEA Z87.1 when operations present a potential eye injury hazard. Provide goggles to personnel engaged in asbestos abatement operations when the use of a full face respirator is not required.

3.1.4 Regulated Areas

All Class I, II, and III asbestos work must be conducted within regulated areas. The regulated area must be demarcated to minimize the number of persons within the area and to protect persons outside the area from exposure to airborne asbestos. Control access to regulated areas, ensure that only authorized personnel enter, and verify that Contractor required medical surveillance, training and respiratory protection program requirements are met prior to allowing entrance.

3.1.5 Load-out Unit

Provide a temporary load-out unit that is adjacent and connected to the regulated area[and][access tunnel]. Attach the load-out unit in a leak-tight manner to each regulated area.

3.1.6 Warning Signs and Labels

Provide[bilingual] warning signs[printed in English and [_____]] at all approaches to asbestos control areas. Locate signs at such a distance that personnel may read the sign and take the necessary protective steps required before entering the area. Provide labels and affix to all asbestos materials, scrap, waste, debris, and other products contaminated with asbestos. Containers with preprinted warning labels conforming to the requirements are acceptable

3.1.6.1 Warning Sign

****
NOTE: "WEAR RESPIRATORY PROTECTION AND PROTECTIVE CLOTHING IN THIS AREA" will be added to the warning sign when protective equipment is required.
****

Provide vertical format conforming to 29 CFR 1926.200, and 29 CFR 1926.1101 minimum 500 by 355 mm 20 by 14 inches displaying the following legend in the lower panel:

Legend	Notation
DANGER	25 mm one inch Sans Serif Gothic or Block
ASBESTOS	25 mm one inch Sans Serif Gothic or Block
MAY CAUSE CANCER	25 mm one inch Sans Serif Gothic or Block

Legend	Notation
CAUSES DAMAGE TO LUNGS	6 mm 1/4 inch Sans Serif Gothic or Block
AUTHORIZED PERSONNEL ONLY	6 mm 1/4 inch Sans Serif Gothic or Block
[WEAR RESPIRATORY PROTECTION AND PROTECTIVE CLOTHING IN THIS AREA]	6 mm 1/4 inch Sans Serif Gothic or Block

Spacing between lines must be at least equal to the height of the upper of any two lines.

3.1.6.2 Warning Labels

Provide labels conforming to 29 CFR 1926.1101 of sufficient size to be clearly legible, displaying the following legend:

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

3.1.7 Local Exhaust System

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NOTE: When a negative pressure enclosure is not required, delete the requirements for the local exhaust system and pressure differential recording.

****

Provide a local exhaust system in the asbestos control area in accordance with ASSP Z9.2 and 29 CFR 1926.1101 that will provide at least four air changes per hour inside of the negative pressure enclosure. Local exhaust equipment must be operated 24-hours per day, until the asbestos control area is removed and must be leak proof to the filter and equipped with HEPA filters. Maintain a minimum pressure differential in the control area of minus 0.51 mm 0.02 inch of water column relative to adjacent, unsealed areas. Provide continuous 24-hour per day monitoring of the pressure differential with a pressure differential automatic recording instrument. The building ventilation system must not be used as the local exhaust system for the asbestos control area. Filters on exhaust equipment must conform to ASSP Z9.2 and UL 586. Terminate the local exhaust system out of doors and remote from any public access or ventilation system intakes.

3.1.8 Tools

Vacuums must be leak proof to the filter and equipped with HEPA filters. Filters on vacuums must conform to ASSP 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. Reusable tools must be thoroughly decontaminated prior to being removed from the regulated areas.

3.1.9 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.

[3.1.10 Glovebags

****
NOTE: Include this paragraph if glovebag technique is permitted to be used in the project.
****

Submit written manufacturers proof that glovebags will not break down under expected temperatures and conditions.

]3.1.11 Single Stage Decontamination Area

A decontamination area (equipment room/area) must be provided for Class I work involving less than 7.5 m 25 feet or 0.9 square meters 10 square feet of TSI or surfacing ACM, and for Class II and Class III asbestos work operations where exposures exceed the PELs or where there is no negative exposure assessment. The equipment room or area must be adjacent to the regulated area for the decontamination of employees, material, and their equipment which could be contaminated with asbestos. The area must be covered by an impermeable drop cloth on the floor or horizontal working surface. The area must be of sufficient size to accommodate cleaning of equipment and removing personal protective equipment without spreading contamination beyond the area.

3.1.12 Decontamination Area Exit Procedures

Ensure that the following procedures are followed:

a. Before leaving the regulated area, remove all gross contamination and debris from work clothing using a HEPA vacuum.

b. Employees must remove their protective clothing in the equipment room and deposit the clothing in labeled impermeable bags or containers for disposal or laundering.

c. Employees must not remove their respirators until showering.

d. Employees must shower prior to entering the clean room. If a shower has not been located between the equipment room and the clean room or the work is performed outdoors, ensure that employees engaged in Class I asbestos jobs: a) Remove asbestos contamination from their work suits in the equipment room or decontamination area using a HEPA vacuum before proceeding to a shower that is not adjacent to the work

area; or b) Remove their contaminated work suits in the equipment room, without cleaning worksuits, and proceed to a shower that is not adjacent to the work area.

3.2 WORK PROCEDURE

****

NOTE: EPA NESHAP at 40 CFR 61, Subpart M and OSHA 29 CFR 1926.1101(g)(1)(ii) require adequately wet removal procedures. Use wet removal procedures in almost all cases. Wet removal is the preferred method and the least hazardous. Dry removal as an option can be used to allow the Contractor to use dry removal where wet removal may damage equipment or present an extreme hazard. Dry removal as the only method of removal should only be specified if freezing is likely to occur, safety hazards preclude the use of water, or severe water damage to equipment, would occur during wet removal. If dry removal alone is allowed, carefully edit the specification to remove all reference to amended water and wetting down procedures and to include a requirement for a written variance submitted by the Contractor along with the written approval of any regulatory authority having jurisdiction.

****

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NOTE: Negative pressure enclosure and glovebag techniques pertain to the two most general but yet essentially different asbestos control techniques used for asbestos removal. Encapsulation work practice techniques are listed here, also. The use of unlisted removal work practice techniques will be acceptable if they are proven at least as safe as the listed practices. The appropriate technique depends on existing conditions, but must be that technique that provides the best control during abatement at most reasonable cost.

****

****

NOTE: Requirements for abatement of asbestos outdoors varies considerably with the work and the location involved. Specify minimum requirements for abatement of asbestos outdoors where construction of a containment is not practical. The designer will provide the best suited, specific requirements necessary for the particular project to prohibit or reduce asbestos exposure to other Contractor employees, customer resources and the general public.

****

Perform asbestos related work in accordance with 29 CFR 1926.1101, 40 CFR 61-SUBPART M,[NAVFAC P-502,] and as specified herein. Use [[wet][or][if given prior EPA approval, dry] removal procedures][appropriate encapsulation procedures as listed in the asbestos hazard abatement plan] and [negative pressure enclosure] [_____] techniques. Wear and utilize protective clothing and equipment as specified herein. No eating,

smoking, drinking, chewing gum, tobacco, or applying cosmeticsis permitted in the asbestos work or control areas. Personnel of other trades not engaged in the [encapsulation][removal and demolition] of asbestos containing material must not be exposed at any time to airborne concentrations of asbestos unless all the personnel protection and training provisions of this specification are complied with by the trade personnel.[Seal all roof top penetrations, except plumbing vents, prior to asbestos roofing work.] Shut down the building heating, ventilating, and air conditioning system, cap the openings to the system, [and provide temporary [heating,][and][ventilation,][and][air conditioning]] prior to the commencement of asbestos work. Power to the regulated area must be locked-out and tagged in accordance with 29 CFR 1910.147.[Disconnect electrical service when [encapsulation][wet removal] is performed and provide temporary electrical service with verifiable ground fault circuit interrupter (GFCI) protection prior to the use of any [water][encapsulant].] All electrical work must be performed by a licensed electrician. Stop abatement work in the regulated area immediately when the airborne total fiber concentration: (1) equals or exceeds 0.01 f/cc, or the pre-abatement concentration, whichever is greater, outside the regulated area; or (2) equals or exceeds 1.0 f/cc inside the regulated area. Correct the condition to the satisfaction of the Contracting Officer, including visual inspection and air sampling. Work must resume only upon notification by the Contracting Officer. Corrective actions must be documented. If an asbestos fiber release or spill occurs[outside of the asbestos control area], stop work immediately, correct the condition to the satisfaction of the Contracting Officer including clearance sampling, prior to resumption of work.

3.2.1 Building Ventilation System and Critical Barriers

Building ventilation system supply and return air ducts in a regulated area must be[shut down and isolated by lockable switch or other positive means in accordance with 29 CFR 1910.147.][isolated by airtight seals to prevent the spread of contamination throughout the system.] The airtight seals must consist of [air-tight rigid covers for building ventilation supply and exhaust grills where the ventilation system is required to remain in service during abatement][2 layers of polyethylene]. Edges to wall, ceiling and floor surfaces must be sealed with industrial grade duct tape.

a. A Competent Person must supervise the work.

b. For indoor work, critical barriers must be placed over all openings to the regulated area.

c. Impermeable dropcloths must be placed on surfaces beneath all removal activity.

3.2.2 Protection of Existing Work to Remain

****

NOTE: Normal practice is to have the Contractor hire one independent Private Qualified Person (the PQP) to perform all required functions. However, some applicable laws forbid this approach and will dictate when the PQP, the GC or both will be required to perform the function involved. However, the Contractor must always hire a PQP.

****

Perform work without damage or contamination of adjacent work. Where such work is damaged or contaminated as verified by the Contracting Officer using visual inspection or sample analysis, it must be restored to its original condition or decontaminated by the Contractor at no expense to the Government as deemed appropriate by the Contracting Officer. 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 from the [PQP][GC] work may proceed at the discretion of the Contracting Officer.

3.2.3 Furnishings

****
NOTE: Choose one of the following options. In most projects, the Government will remove furniture and equipment before the Contractor begins work. In this case the first paragraph should be used. The third paragraph should only be used when existing furnishings have been contaminated with asbestos fibers and the Contractor will be required to clean these items. When the third paragraph is used, identify the furnishings and indicate the quantity of each.
****

****
NOTE: The designer must decide if porous, non-solid surfaced items can be cleaned or must be disposed of as contaminated waste. If cleaning is chosen, specify methods.
****

[Furniture [,(_____)] and equipment will be removed from the area of work by the Government before asbestos work begins.

][Furniture [,(_____)] and equipment will remain in the building. Cover and seal furnishings with 0.15 mm 6-mil plastic sheet or remove from the work area and store in a location on site approved by the Contracting Officer.

][Furnishings listed below and located in the work area are considered to be contaminated with asbestos fibers. Transfer these items to an area on site approved by the Contracting Officer, decontaminate (wet methods where possible), and then store until the room from which they came is declared clean and safe for entry.[Carpets, draperies, and other items with porous, non-solid surfaces can not be suitably cleaned and must be properly disposed of as contaminated waste.] At the conclusion of the asbestos removal work and cleanup operations, transfer all objects so removed and cleaned back to the area from which they came and re-install them. Base bids on decontaminating:

a. [_____] Desks

b. [_____] Filing cabinets

c. [_____] Linear meters feet of shelving

d. [_____] Cubic meters feet of books, papers, files, [_____].

e. [_____].

]3.2.4 Precleaning

Wet wipe and HEPA vacuum all surfaces potentially contaminated with asbestos prior to establishment of an enclosure.

3.2.5 Asbestos Control Area Requirements

****
NOTE: When negative pressure enclosure is infeasible, use paragraph GLOVEBAG and delete paragraph NEGATIVE PRESSURE ENCLOSURE. If the project has both areas which can be enclosed and areas which cannot be enclosed, retain the appropriate paragraphs and identify the areas which must be enclosed and the areas which cannot be enclosed.
****

3.2.5.1 Negative Pressure Enclosure

****
NOTE: Describe the ACM that must be removed using a Negative Pressure Enclosure.
****

Removal of [asbestos contaminated acoustical ceiling tiles,] [spray applied fireproofing,] [thermal system insulation,] [gypsum wallboard/joint compound] [_____] require the use of a negative pressure enclosure. Block and seal openings in areas where the release of airborne asbestos fibers can be expected. 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. Negative pressure enclosure development must include protective covering of uncontaminated walls, and ceilings with a continuous membrane of two layers of minimum 0.15 mm 6-mil plastic sheet sealed with tape to prevent water or other damage. Provide two layers of 0.15 mm 6-mil plastic sheet over floors and extend a minimum of 300 mm 12 inches up walls. Seal all joints with tape. Provide local exhaust system in the asbestos control area. Openings will be allowed in enclosures of asbestos control areas for personnel and equipment entry and exit, the supply and exhaust of air for the local exhaust system and the removal of properly containerized asbestos containing materials. Replace local exhaust system filters as required to maintain the efficiency of the system.

3.2.5.2 Glovebag

****
NOTE: Specify the asbestos material to be removed in the first blank and identify the location of the area which cannot be enclosed in the second blank. Verify State and local regulations allow the use of glovebags.
****

If the construction of a negative pressure enclosure is infeasible for the

[removal] [encapsulation] of [_____] located [_____]. Use alternate techniques as indicated in 29 CFR 1926.1101. Establish designated limits for the asbestos regulated area with the use of rope or other continuous barriers, and maintain all other requirements for asbestos control areas. The PQP must conduct personal samples of each worker engaged in asbestos handling (removal, disposal, transport and other associated work) throughout the duration of the project. If the quantity of airborne asbestos fibers monitored at the breathing zone of the workers at any time exceeds background or 0.01 fibers per cubic centimeter whichever is greater, stop work, evacuate personnel in adjacent areas or provide personnel with approved protective equipment at the discretion of the Contracting Officer. This sampling may be duplicated by the Government at the discretion of the Contracting Officer. If the air sampling results obtained by the Government differ from those obtained by the Contractor, the Government will determine which results predominate. If adjacent areas are contaminated as determined by the Contracting Officer, clean the contaminated areas, monitor, and visually inspect the area as specified herein.

3.2.5.3 Regulated Area for Class II Removal

Removal of [asbestos containing floor tile/mastic,] [carpet/mastic,] [sealants,] [_____] are Class II removal activities. Establish designated limits for the asbestos regulated work area with the use of red barrier tape; install critical barriers, splash guards and signs, and maintain all other requirements for asbestos control area except local exhaust. Place impermeable dropcloths on surfaces beneath removal activity extending out 3 feet in all directions. A detached decontamination system may be used. Conduct area monitoring of airborne fibers during the work shift at the designated limits of the asbestos work area and conduct personal samples of each worker engaged in the work. If workers the airborne fiber concentration of the workers or designated limits at any time exceeds background or 0.01 fibers per cubic centimeter, whichever is greater, stop work immediately and correct the situation.

3.2.6 Removal Procedures

****

NOTE: Choose REMOVAL PROCEDURES or ENCAPSULATION PROCEDURES as appropriate for the project.

****

Wet asbestos material with a fine spray of [amended water][a specific wetting agent such as light oil] during removal, cutting, or other handling so as to reduce the emission of airborne fibers. Remove material and immediately place in 0.15 mm 6 mil plastic disposal bags. Remove asbestos containing material in a gradual manner, with continuous application of the amended water or wetting agent in such a manner that no asbestos material is disturbed prior to being adequately wetted. Where unusual circumstances prohibit the use of 0.15 mm 6 mil plastic bags, submit an alternate proposal for containment of asbestos fibers to the Contracting Officer for approval. For example, in the case where both piping and insulation are to be removed, the Contractor may elect to wet the insulation, wrap the pipes and insulation in plastic and remove the pipe by sections. Containerize asbestos containing material while wet. Do not allow asbestos material to accumulate or become dry. Lower and otherwise handle asbestos containing material as indicated in 40 CFR 61-SUBPART M.

3.2.6.1 Sealing Contaminated Items Designated for Disposal

****
NOTE: Use this paragraph only when asbestos contaminated items are also designated for removal and disposal.
****

Remove contaminated architectural, mechanical, and electrical appurtenances such as venetian blinds, full-height partitions, carpeting, duct work, pipes and fittings, radiators, light fixtures, conduit, panels, and other contaminated items designated for removal by completely coating the items with an asbestos lock-down encapsulant at the demolition site before removing the items from the asbestos control area. These items need not be vacuumed. The asbestos lock-down encapsulant must be tinted a contrasting color and spray-applied by airless method. Thoroughness of sealing operation must be visually gauged by the extent of colored coating on exposed surfaces. Lock-down encapsulants must comply with the performance requirements specified herein.

3.2.6.2 Exposed Pipe Insulation Edges

Contain edges of asbestos insulation to remain that are exposed by a removal operation. Wet and cut the rough ends true and square with sharp tools and then encapsulate the edges with a 6 mm 1/4 inch thick layer of non-asbestos containing insulating cement troweled to a smooth hard finish. When cement is dry, lag the end with a layer of non-asbestos lagging cloth, overlapping the existing ends by at least 100 mm 4 inches. When insulating cement and cloth is an impractical method of sealing a raw edge of asbestos, take appropriate steps to seal the raw edges as approved by the Contracting Officer.

3.2.7 Methods of Compliance

3.2.7.1 Mandated Practices

The specific abatement techniques and items identified must be detailed in the Contractor's AHAP. Use the following engineering controls and work practices in all operations, regardless of the levels of exposure:

a. Vacuum cleaners equipped with HEPA filters.

b. Wet methods or wetting agents except where it can be demonstrated that the use of wet methods is unfeasible due to the creation of electrical hazards, equipment malfunction, and in roofing.

c. Prompt clean-up and disposal.

d. Inspection and repair of polyethylene.

e. Cleaning of equipment and surfaces of containers prior to removing them from the equipment room or area.

3.2.7.2 Control Methods

Use the following control methods:

a. Local exhaust ventilation equipped with HEPA filter;

b. Enclosure or isolation of processes producing asbestos dust;

c. Where the feasible engineering and work practice controls are not sufficient to reduce employee exposure to or below the PELs, use them to reduce employee exposure to the lowest levels attainable and must supplement them by the use of respiratory protection.

3.2.7.3 Unacceptable Practices

The following work practices must not be used:

a. High-speed abrasive disc saws that are not equipped with point of cut ventilator or enclosures with HEPA filtered exhaust air.

b. Compressed air used to remove asbestos containing materials, unless the compressed air is used in conjunction with an enclosed ventilation system designed to capture the dust cloud created by the compressed air.

c. Dry sweeping, shoveling, or other dry clean up.

d. Employee rotation as a means of reducing employee exposure to asbestos.

3.2.8 Class I Work Procedures

****

Note: OSHA believes that most outdoor Class I work may be safely done without enclosures (ref. OSHA Instruction CPL 2-2.63, change 1, dated 9 January 1996); that is, OSHA does not require enclosures. An exposure assessment must be made prior to outdoor work to determine other required controls. Remove this paragraph when not required in the project.

****

In addition to requirements of paragraphs MANDATED PRACTICES and CONTROL METHODS, the following engineering controls and work practices must be used:

a. A Competent Person must supervise the installation and operation of the control methods.

b. For jobs involving the removal of more than 7.5 m 25 feet or 0.9 square m 10 square feet of TSI or surfacing material, place critical barriers over all openings to the regulated area.

c. HVAC systems must be isolated in the regulated area by sealing with a double layer of plastic or air-tight rigid covers.

d. Impermeable dropcloths (0.15 mm6 mil or greater thickness) must be placed on surfaces beneath all removal activity.

e. Where a negative exposure assessment has not been provided or where exposure monitoring shows the PEL was exceeded, the regulated area must be ventilated with a HEPA unit and employees must use PPE.

3.2.9 Specific Control Methods for Class I Work

****

NOTE: Remove these paragraph or subparagraphs when not required in the project.
****

Use Class I work procedures, control methods and removal methods for the following ACM:

a. Spray Applied Fireproofing

b. Gypsum Wallboard and Joint Compound

c. Thermal System Insulation and Mudded Pipe Fittings

d. Plaster and Textured Ceilings and Walls

e. Vermiculite

3.2.9.1 Negative Pressure Enclosure (NPE) System

****
NOTE: Before specifying a negative pressure enclosure system, the designer should determine if an enclosure system is feasible. The enclosure should be the minimum area to encompass all the working surfaces yet allow unencumbered movement by the workers, provide unrestricted air flow past the workers, and ensure walking surfaces can be kept free of tripping hazards.
****

The system must provide at least four air changes per hour inside the containment. The local exhaust unit equipment must be operated 24-hours per day until the containment is removed. The NPE must be smoke tested for leaks at the beginning of each shift and be sufficient to maintain a minimum pressure differential of minus 0.5 mm 0.02 inch of water column relative to adjacent, unsealed areas. Pressure differential must be monitored continuously, 24-hours per day, with an automatic manometric recording instrument and Records must be provided daily on the same day collected to the Contracting Officer. The Contracting Officer must be notified immediately if the pressure differential falls below the prescribed minimum. The building ventilation system must not be used as the local exhaust system for the regulated area. The NPE must terminate outdoors unless an alternate arrangement is allowed by the Contracting Officer. All filters used must be new at the beginning of the project and must be periodically changed as necessary and disposed of as ACM waste.

3.2.9.2 Glovebag Systems

Glovebags must be used without modification, smoke-tested for leaks, and completely cover the circumference of pipe or other structures where the work is to be done. Glovebags must be used only once and must not be moved. Glovebags must not be used on surfaces that have temperatures exceeding 66 degrees C 150 degrees F. Prior to disposal, glovebags must be collapsed using a HEPA vacuum. Before beginning the operation, loose and friable material adjacent to the glovebag operation must be wrapped and sealed in 2 layers of plastic or otherwise rendered intact. At least two persons must perform glovebag removal. Asbestos regulated work areas must be established for glovebag abatement. Designated boundary limits for the asbestos work must be established with rope or other continuous

barriers and all other requirements for asbestos control areas must be maintained, including area signage and boundary warning tape.

a. Attach HEPA vacuum systems to the bag to prevent collapse during removal of ACM.

b. The negative pressure glove boxes must be fitted with gloved apertures and a bagging outlet and constructed with rigid sides from metal or other material which can withstand the weight of the ACM and water used during removal. A negative pressure must be created in the system using a HEPA filtration system. The box must be smoke tested for leaks prior to each use.

3.2.9.3 Mini-Enclosure

[Single bulkhead containment][Double bulkhead containment][or][Mini-containment (small walk-in enclosure)] to accommodate no more than two persons, may be used if the disturbance or removal can be completely contained by the enclosure. The mini-enclosure must be inspected for leaks and smoke tested before each use. Air movement must be directed away from the employee's breathing zone within the mini-enclosure.

3.2.9.4 Wrap and Cut Operation

****

NOTE: When pipes are insulated with ACM, removal of the entire pipe may be more protective, easier, and more cost-effective than stripping the asbestos insulation from the pipe. The wrap and cut procedure consists of two distinct operations. The wrap portion requires the removal of small amounts of asbestos from either side of the pipe to be cut; this will be a Class I or III operation depending on the amount of asbestos removed. Once the asbestos is removed and wrapped, the pipe is then cut. OSHA considers the cutting portion of the job as unclassified, as it does not involve asbestos removal. If the wrap and cut operation is conducted in a negative pressure enclosure system, the glovebag step is not required, although recommended.

****

Prior to cutting pipe, the asbestos-containing insulation must be wrapped with polyethylene and securely sealed with duct tape to prevent asbestos becoming airborne as a result of the cutting process. The following steps must be taken: install glovebag, strip back sections to be cut 150 mm 6 inches from point of cut, and cut pipe into manageable sections.

3.2.9.5 Class I Removal Method

****

NOTE: The removal procedures described below are typical for asbestos abatement projects. Revise or add additional removal procedures as required to address the specific ACM to be abated. Consult with Federal, State and local regulations for additional information.

****

Class I ACM must be removed using a control method described above. Prepare work area as previously specified. Establish designated limits for the asbestos regulated work area with the use of red barrier tape, critical barriers, signs, and maintain all other requirements for asbestos control area. Spread one layer of 0.15 mm 6-mil seamless plastic sheeting on the floor below the work area.[Remove asbestos containing spray applied fireproofing using a scraper and wet methods and immediately place into 0.15 mm 6-mil thickness disposal bag. After removal of the material use a wire brush to clean the exposed substrate to remove residual material. Continue wet cleaning until surfaces are free of visible debris.][Cut manageable sections of gypsum wallboard and joint compound and immediately place into a 0.15 mm 6-mil minimum thickness disposal bag or other approved container. Make every effort to keep the material from falling to the floor of the work area. Use a wire brush and wet clean to remove residual material from studs. Continue wet cleaning until the surface is clean of visible material and encapsulate stud walls.][Remove ACM thermal system insulation and mudded pipe fittings using mechanical means and wet methods and immediately place into 0.15 mm 6-mil thickness disposal bag. Continue wet cleaning until surfaces are free of visible debris.][Remove ACM plaster ceilings or walls using mechanical means and adequately wet methods and immediately place into 0.15 mm 6-mil thickness disposal bag. Make every effort to keep the material from falling to the floor of the work area. Continue wet cleaning until surfaces are free of visible debris.][Remove ACM textured ceiling finish using a scraper and wet methods and immediately place into 0.15 mm 6-mil thickness disposal bag. Floors are considered contaminated from fallen textured ceiling finish. Clean up debris on floor and dispose of [carpet]as asbestos contaminated material. After removal of the material use a wire brush to clean the exposed [concrete]ceiling to remove residual material. Continue wet cleaning until surfaces are free of visible debris.][Remove ACM vermiculite using mechanical means and adequately wet methods and immediately place into 0.15 mm 6-mil thickness disposal bag. Make every effort to keep the material from falling to the floor of the work area. Continue wet cleaning until surfaces are free of visible debris.] Bag all asbestos debris which has fallen to the floor as asbestos-containing debris. Place all debris in plastic disposal bags of 0.15 mm 6-mil minimum thickness. Once the material is in the disposal bag, apply additional water as needed to achieve "adequately wet" conditions for NESHAP compliance. Place bagged asbestos waste under negative pressure with the use of a HEPA vacuum, goose neck and duck tape to seal the bag, wash to remove any visible contamination and place into a second 0.15 mm 6-mil minimum thickness disposal bag. Containerize asbestos containing waste while wet. Lower and otherwise handle asbestos containing materials as indicated in 40 CFR 61-SUBPART M. Conduct area monitoring of airborne fibers during the work shift at the designated limits of the asbestos work area and conduct personal samples of each worker engaged in the work. If the quantity of airborne asbestos fibers monitored at the breathing zone of the workers or the designated limits at any time exceeds background or 0.01 fibers per cubic centimeter, whichever is greater, stop work, and immediately correct the situation.

3.2.10 Class II Work Procedures

****

NOTE: Class II work may also be performed using a method allowed for Class I work, except that glovebags and glove boxes are allowed if they fully enclose the Class II material to be removed. Remove this paragraph when not required in the project.

****

In addition to the requirements of paragraphs MANDATED PRACTICES and CONTROL METHODS, the following engineering controls and work practices must be used:

a. A Competent Person must supervise the work.

b. For indoor work, critical barriers must be placed over all openings to the regulated area.

c. Impermeable dropcloths must be placed on surfaces beneath all removal activity.

3.2.11 Specific Control Methods for Class II Work

****

NOTE: If the removal of the adhesive is necessary, wet methods should be used when removing residual adhesive. The adhesive must be either wet-scraped manually or removed using low speed floor machine (300 RPM or less) and wetted sand or a removal solution. The adhesive residues must be placed in an impermeable trash bag while still wet. Remaining water or dirt in the area must then be HEPA vacuumed.

Removal of "intact" cements, coatings, mastics, and flashings is not Class II work. ACM is not rendered non-intact simply by being separated into smaller pieces.

Remove these paragraph or subparagraphs when not required in the project.

****

****

NOTE: The removal procedures described below are typical for asbestos abatement projects. Delete, revise or add additional removal procedures as required to address the specific ACM to be abated. Consult with Federal, State and local regulations for additional information.

****

3.2.11.1 [Vinyl and Asphaltic Flooring Materials] [Carpet and Mastic]

Establish designated limits for the asbestos regulated work area with the use of red barrier tape, critical barriers, signs, and maintain all other requirements for asbestos control area except local exhaust. A detached decontamination system may be used. When removing [vinyl floor tile and mastic][carpet and mastic] which contains ACM, use the following practices. Remove [floor tile and mastic][carpet and mastic] using adequately wet methods. Remove [floor tiles][carpet and mastic] intact (if possible).[Wetting is not required when floor tiles are heated and removed intact.] Do not sand flooring or its backing. Scrape residual adhesive and backing using wet methods. Mechanical chipping is prohibited unless performed in a negative pressure enclosure. Dry sweeping is prohibited. Use vacuums equipped with HEPA filter, disposable dust bag, and metal floor tool (no brush) to clean floors. Place debris into a 0.15

mm 6-mil minimum thickness disposal bag or other approved container. Once the material is in the disposal bag, apply additional water as needed to achieve "adequately wet" conditions for NESHAP compliance. Place bagged asbestos waste under negative pressure with the use of a HEPA vacuum, goose neck and duck tape to seal the bag, wash to remove any visible contamination and place into a second 0.15 mm 6-mil minimum thickness disposal bag. Containerize asbestos containing waste while wet. Lower and otherwise handle asbestos containing materials as indicated in 40 CFR 61-SUBPART M. Conduct area monitoring of airborne fibers during the work shift at the designated limits of the asbestos work area and conduct personal samples of each worker engaged in the work. If workers the airborne fiber concentration of the workers or designated limits at any time exceeds background or 0.01 fibers per cubic centimeter, whichever is greater, stop work immediately and correct the situation.

3.2.11.2 Sealants and Mastic

Establish designated limits for the asbestos regulated work area with the use of red barrier tape, critical barriers and signs, and maintain all other requirements for asbestos control area except local exhaust. Spread 0.15 mm 6-mil plastic sheeting on the ground around the perimeter of the work area extending out in all directions. Using adequately wet methods, carefully remove the ACM sealants and mastics using a scraper of knife blade. As it is removed place the material into a disposal bag. Make every effort to keep the asbestos material from falling to the ground or work area floor below. Dry sweeping is prohibited. Use vacuums equipped with HEPA filter and disposable dust bag. Place debris into a 0.15 mm 6-mil minimum thickness disposal bag or other approved container. Once the material is in the disposal bag, apply additional water as needed to achieve "adequately wet" conditions for NESHAP compliance. Place bagged asbestos waste under negative pressure with the use of a HEPA vacuum, goose neck and duck tape to seal the bag, wash to remove any visible contamination and place into a second 0.15 mm 6-mil minimum thickness disposal bag. Containerize asbestos containing waste while wet. Lower and otherwise handle asbestos containing materials as indicated in 40 CFR 61-SUBPART M. Conduct area monitoring of airborne fibers during the work shift at the designated limits of the asbestos work area and conduct personal samples of each worker engaged in the work. If the airborne fiber concentration of the workers or at designated limits at any time exceeds background or 0.01 fibers per cubic centimeter, whichever is greater, stop work immediately and correct the situation.

3.2.11.3 Suspect Fire Doors

Establish designated limits for the asbestos regulated work area with the use of red barrier tape, critical barriers, signs, and maintain all other requirements for asbestos control area except local exhaust. A detached decontamination system may be used. Spread 0.15 mm 6-mil plastic sheeting on the ground beneath the work area and around the perimeter of the work area extending out in all directions. Remove door intact from hinges and wrap with 6-mil plastic sheeting. Inspect the interior areas of the door to determine if ACM is present. If ACM is not present the door may be disposed of as general construction debris. If ACM is present place whole door in enclosed container for disposal. Conduct area monitoring of airborne fibers during the work shift at the designated limits of the asbestos work area and conduct personal samples of each worker engaged in the work. If the airborne fiber concentration of the workers or designated limits at any time exceeds background or 0.01 fibers per cubic centimeter, whichever is greater, stop work immediately and correct the

situation.

3.2.11.4 Roofing Materials

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NOTE: Removal or repair of sections of intact roofing less than 2.5 square meters 25 square feet in area does not require use of wet methods or HEPA vacuuming as long as manual methods, which do not render the material non-intact, are used to remove the material without creating visible dust. In determining whether a job involves less than 2.5 square meters 25 square feet, the designer should specify all removal and repair work to be performed on the same roof on the same day.

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Establish designated limits for the asbestos regulated work area with the use of red barrier tape, critical barriers, signs, and maintain all other requirements for asbestos control area except local exhaust. When removing roofing materials which contain ACM as described in 29 CFR 1926.1101(g)(8)(ii), use the following practices. Roofing material must be removed in an intact state. Wet methods must be used to remove roofing materials that are not intact, or that will be rendered not intact during removal, unless such wet methods are not feasible or will create safety hazards. When removing built-up roofs, with asbestos-containing roofing felts and an aggregate surface, using a power roof cutter, all dust resulting from the cutting operations must be collected by a HEPA dust collector, or must be HEPA vacuumed by vacuuming along the cut line. Asbestos-containing roofing material must not be dropped or thrown to the ground, but must be lowered to the ground via covered, dust-tight chute, crane, hoist or other method approved by the Contracting Officer. Any ACM that is not intact must be lowered to the ground as soon as practicable, but not later than the end of the work shift. While the material remains on the roof it must be kept wet or placed in an impermeable waste bag or wrapped in plastic sheeting. Intact ACM must be lowered to the ground as soon as practicable, but not later than the end of the work shift. Unwrapped material must be transferred to a closed receptacle. Critical barriers must be placed over roof level heating and ventilation air intakes. Conduct area monitoring of airborne fibers during the work shift at the designated limits of the asbestos work area and conduct personal samples of each worker engaged in the work. If the airborne fiber concentration of the workers or designated limits at any time exceeds background or 0.01 fibers per cubic centimeter, whichever is greater, stop work immediately and correct the situation.

3.2.11.5 Cementitious Siding and Shingles or Transite Panels

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NOTE: Alternate work practices which do not involve hand removal may be specified according to 29 CFR 1926.1101(g)(8)(vi), "Alternative Work Practices and Controls"; EPA 340/1-92/013 "A Guide to Normal Demolition Practices Under the Asbestos NESHAP"; EPA document Asbestos/Demolition Decision Tree (1994); state and local requirements. For application on multiple building demolition or siding removal, pilot tests to determine feasibility, practicality, and compliance are recommended.

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Establish designated limits for the asbestos regulated work area with the use of red barrier tape, critical barriers, signs, and maintain all other requirements for asbestos control area except local exhaust. When removing cementitious asbestos-containing siding, shingles or Transite panels use the following work practices. Intentionally cutting, abrading or breaking is prohibited. Each panel or shingle must be sprayed with amended water prior to removal. Nails must be cut with flat, sharp instruments. Unwrapped or unbagged panels or shingles must be immediately lowered to the ground via covered dust-tight chute, crane or hoist, or placed in an impervious waste bag or wrapped in plastic sheeting and lowered to the ground no later than the end of the work shift. Place debris into a 0.15 mm 6-mil minimum thickness disposal bag or other approved container. Once the material is in the disposal bag, apply additional water as needed to achieve "adequately wet" conditions for NESHAP compliance. Place bagged asbestos waste under negative pressure with the use of a HEPA vacuum, goose neck and duck tape to seal the bag, wash to remove any visible contamination and place into a second 0.15 mm 6-mil minimum thickness disposal bag. Containerize asbestos containing waste while wet. Conduct area monitoring of airborne fibers during the work shift at the designated limits of the asbestos work area and conduct personal samples of each worker engaged in the work. If the airborne fiber concentration of the workers or designated limits at any time exceeds background or 0.01 fibers per cubic centimeter, whichever is greater, stop work immediately and correct the situation.

3.2.11.6 Gaskets

Establish designated limits for the asbestos regulated work area with the use of red barrier tape, critical barriers, signs, and maintain all other requirements for asbestos control area except local exhaust. Gaskets must be thoroughly wetted with amended water prior to removal and immediately placed in a disposal container. If a gasket is visibly deteriorated and unlikely to be removed intact, removal must be undertaken within a glovebag. Any scraping to remove residue must be performed wet. Place debris into a 0.15 mm 6-mil minimum thickness disposal bag or other approved container. Once the material is in the disposal bag, apply additional water as needed to achieve "adequately wet" conditions for NESHAP compliance. Place bagged asbestos waste under negative pressure with the use of a HEPA vacuum, goose neck and duck tape to seal the bag, wash to remove any visible contamination and place into a second 0.15 mm 6-mil minimum thickness disposal bag. Containerize asbestos containing waste while wet. Conduct area monitoring of airborne fibers during the work shift at the designated limits of the asbestos work area and conduct personal samples of each worker engaged in the work. If the airborne fiber concentration of the workers or designated limits at any time exceeds background or 0.01 fibers per cubic centimeter, whichever is greater, stop work immediately and correct the situation.

[3.2.12 Encapsulation Procedures

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NOTE: Choose REMOVAL PROCEDURES or ENCAPSULATION PROCEDURES as appropriate for the project.

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3.2.12.1 Preparation of Test Patches

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NOTE: Prior to preparing plans and specifications for an encapsulation project, the designer will have to ascertain that encapsulation is feasible at all. The foremost design criteria is the soundness of the existing asbestos containing matrix, i.e. the bond of the matrix to the substrate and the shear strength of the matrix itself. The designer should test the existing matrix in accordance with the ASTM E1494, using the Field Testing Provisions for the Adhesion Test.
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NOTE: Exercise discretion on the number and location of Contractor applied test patches. However, a minimum of three test patches should always be specified. Test locations, in areas of the matrix, that have a different appearance or raise doubts about their homogeneity. Specify number of test patches in first bracket and location in second bracket. Also show location on drawings.
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Install [three] [_____] test patches of encapsulant in [_____], as indicated. Use airless spray at the lowest pressure and as recommended by the encapsulant manufacturer. Follow exactly the manufacturer's instructions for thinning recommendations, application procedures and rates. Curing time must be not less than five days or that recommended by the manufacturer, whichever is more. A test patch must be 0.8 square meter 9 square feet in size.

3.2.12.2 Field Testing

Field test the encapsulation test patches in accordance with ASTM E1494, paragraph "Required Field Test," in the presence of the Contracting Officer. Keep a written record of the testing procedures and test results. Upon successful testing of the encapsulant, submit a signed statement to the Contracting Officer certifying that the encapsulant is suitable for installation on the particular asbestos containing material.

3.2.12.3 Large-Scale Application

Apply encapsulant using the same equipment and procedures as employed for the test patches. Keep the encapsulant material stirred to prevent settling. Keep a clean work area. Change pre-filters in the ventilation equipment as soon as they appear clogged by encapsulant aerosol or pressure differential drops below 0.02 Hg.

]3.2.13 Abatement of Asbestos Contaminated Soil

Establish designated limits for the asbestos regulated work area with the use of red barrier tape, critical barriers, signs, and maintain all other requirements for asbestos control area except local exhaust. Asbestos contaminated soil must be removed from areas to a minimum depth of [50] [_____] mm [2] [_____] inches. Soil must be thoroughly dampened with amended water and then removed by manual shoveling into labeled

containers. Place debris into a 0.15 mm 6-mil minimum thickness disposal bag or other approved container. Once the material is in the disposal bag, apply additional water as needed to achieve "adequately wet" conditions for NESHAP compliance. Place bagged asbestos waste under negative pressure with the use of a HEPA vacuum, goose neck and duck tape to seal the bag, wash to remove any visible contamination and place into a second 0.15 mm 6-mil minimum thickness disposal bag. Containerize asbestos containing waste while wet. Conduct area monitoring of airborne fibers during the work shift at the designated limits of the asbestos work area and conduct personal samples of each worker engaged in the work. If the airborne fiber concentration of the workers or designated limits at any time exceeds background or 0.01 fibers per cubic centimeter, whichever is greater, stop work immediately and correct the situation.

3.2.14 Air Sampling

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NOTE: Air sampling regimen is very dependent on removal method and applicable laws, edit accordingly.

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NOTE: Normal practice is to have the Contractor hire one independent Private Qualified Person (the PQP) to perform all required functions. However, some applicable laws forbid this approach and will dictate when the PQP, the GC or both will be required to perform the function involved. However, the Contractor must always hire a PQP.

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Perform sampling of airborne concentrations of asbestos fibers in accordance with 29 CFR 1926.1101, the Contractor's air monitoring plan and as specified herein. Sampling performed in accordance with 29 CFR 1926.1101 must be performed by the PQP.[Sampling performed for environmental and quality control reasons must be performed by the [PQP][GC].] Unless otherwise specified, use NIOSH Method 7400 for sampling and analysis. Monitoring may be duplicated by the Government at the discretion of the Contracting Officer. If the air sampling results obtained by the Government differ from those results obtained by the Contractor, the Government will determine which results predominate. Results of breathing zone samples must be posted at the job site and made available to the Contracting Officer. Submit all documentation regarding initial exposure assessments, negative exposure assessments, and air-monitoring results.

3.2.14.1 Sampling Prior to Asbestos Work

Provide area air sampling and establish the baseline one day prior to the masking and sealing operations for each [demolition] [removal] [encapsulation] site. Establish the background by performing area sampling in similar but uncontaminated sites in the building.

3.2.14.2 Sampling During Asbestos Work

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NOTE: Choose one of the following options. Normal practice is to have the Contractor hire one independent Private Qualified Person (the PQP) to

perform all required functions. However, some applicable laws forbid this approach and will dictate when the PQP, the GC or both will be required to perform the function involved. However, the Contractor must always hire a PQP.
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NOTE: When an "enclosed" asbestos control area is not required, retain the appropriate portion in brackets.
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[The PQP must provide personal and area sampling as indicated in 29 CFR 1926.1101 and governing environmental regulations. Breathing zone samples must be taken for at least 25 percent of the workers in each shift, or a minimum of two, whichever is greater. Air sample fiber counting must be completed and results provided within 24-hours (breathing zone samples), and [_____] hours (environmental/clearance monitoring) after completion of a sampling period. In addition, provided the same type of work is being performed, provide area sampling at least once every work shift close to the work inside the enclosure, outside the clean room entrance to the enclosure, and at the exhaust opening of the local exhaust system. If sampling outside the enclosure shows airborne levels have exceeded background or 0.01 fibers per cubic centimeter, whichever is greater, stop all work, correct the condition(s) causing the increase, and notify the Contracting Officer immediately.[Where alternate methods are used, perform personal and area air sampling at locations and frequencies that will accurately characterize the evolving airborne asbestos levels.] The written results must be signed by testing laboratory analyst, testing laboratory principal and the [Contractor's PQP][GC]. The air sampling results must be documented on a Contractor's daily air monitoring log.

][The PQP must provide personal sampling as indicated in 29 CFR 1926.1101. Breathing zone samples must be taken for at least 25 percent of the workers in each shift, or a minimum of two, whichever is greater. Breathing zone samples must be taken for at least 25 percent of the workers in each shift, or a minimum of two, whichever is greater. Air sample fiber counting must be completed and results provided within 24-hours (breathing zone samples), and [_____] hours (environmental/clearance monitoring) after completion of a sampling period. At the same time the GC will provide area sampling close to the work inside the enclosure, outside the clean room entrance to the enclosure, and at the exhaust opening of the local exhaust system. In addition, provided the same type of work is being performed, the GC will provide area sampling once every work shift close to the work inside the enclosure, outside the clean room entrance to the enclosure, and at the exhaust opening of the local exhaust system. If sampling outside the enclosure shows airborne levels have exceeded background or 0.01 fibers per cubic centimeter, whichever is greater, stop all work, correct the condition(s) causing the increase, and notify the Contracting Officer immediately.[Where alternate methods are used, perform personal and area air sampling at locations and frequencies that will accurately characterize the evolving airborne asbestos levels.] The written results must be signed by testing laboratory analyst, testing laboratory principal and the [Contractor's PQP][GC]. The air sampling results must be documented on a Contractor's daily air monitoring log.

]3.2.14.3 Final Clearance Requirements, NIOSH PCM Method

For PCM sampling and analysis using NIOSH NMAM Method 7400, the fiber concentration inside the abated regulated area, for each airborne sample, must be less than 0.01 f/cc. The abatement inside the regulated area is considered complete when every PCM final clearance sample is below the clearance limit. If any sample result is greater than 0.01 total f/cc, the asbestos fiber concentration (asbestos f/cc) must be confirmed from that same filter using NIOSH NMAM Method 7402 (TEM) at Contractor's expense. If any confirmation sample result is greater than 0.01 asbestos f/cc, abatement is incomplete and cleaning must be repeated at the Contractor's expense. Upon completion of any required recleaning, resampling with results to meet the above clearance criteria must be done at the Contractor's expense.

3.2.14.4 Final Clearance Requirements, EPA TEM Method

For EPA TEM sampling and analysis, using the EPA Method specified in 40 CFR 763, abatement inside the regulated area is considered complete when the arithmetic mean asbestos concentration of the five inside samples is less than or equal to 70 structures per square millimeter (70 S/mm). When the arithmetic mean is greater than 70 S/mm, the three blank samples must be analyzed. If the three blank samples are greater than 70 S/mm, resampling must be done. If less than 70 S/mm, the five outside samples must be analyzed and a Z-test analysis performed. When the Z-test results are less than 1.65, the decontamination must be considered complete. If the Z-test results are more than 1.65, the abatement is incomplete and cleaning must be repeated. Upon completion of any required recleaning, resampling with results to meet the above clearance criteria must be done at the Contractor's expense.

3.2.14.5 Sampling After Final Clean-Up (Clearance Sampling)

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NOTE: The designer must research the State, regional and local laws, regulations, statutes, to determine whether "aggressive" air sampling is required. However, always use aggressive air sampling techniques after encapsulation type abatement efforts.

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NOTE: Normal practice is to have the Contractor hire one independent Private Qualified Person (the PQP) to perform all required functions. However, some applicable laws forbid this approach and will dictate when the PQP, the GC or both will be required to perform the function involved. However, the Contractor must always hire a PQP.

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NOTE: The designer must research the State, regional and local laws, regulations, statutes, to determine whether TEM analysis is required and the number of samples required.

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Provide area sampling of asbestos fibers[using aggressive air sampling techniques as defined in the EPA 560/5-85-024] and establish an airborne asbestos concentration of less than 0.01 fibers per cubic centimeter after final clean-up but before removal of the enclosure or the asbestos work control area. After final cleanup and the asbestos control area is dry but prior to clearance sampling, the [PQP][and][GC] must perform a visual inspection in accordance with ASTM E1368 to ensure that the asbestos control and work area is free of any accumulations of dirt, dust, or debris.[Prepare a written report signed and dated by the PQP documenting that the asbestos control area is free of dust, dirt, and debris and all waste has been removed.][Perform at least [_____] samples.][Use transmission electron microscopy (TEM) to analyze clearance samples and report the results in accordance with current NIOSH criteria.] The asbestos fiber counts from these samples must be less than 0.01 fibers per cubic centimeter or be not greater than the background, whichever is greater. Should any of the final samples indicate a higher value take appropriate actions to re-clean the area and repeat the sampling and [TEM] analysis at the Contractor's expense.

3.2.14.6 Air Clearance Failure

If clearance sampling results fail to meet the final clearance requirements, pay all costs associated with the required recleaning, resampling, and analysis, until final clearance requirements are met.

3.2.15 Lock-Down

Prior to removal of plastic barriers and after pre-clearance clean up of gross contamination, the [PQP][GC] must conduct a visual inspection of all areas affected by the [removal][encapsulation] in accordance with ASTM E1368. Inspect for any visible fibers[, and to ensure that encapsulants were applied evenly and appropriately].[Spray apply a post removal (lock-down) encapsulant to ceiling, walls, floors and other areas exposed in the removal area. The exposed areaincludes but is not limited to plastic barriers, furnishings and articles to be discarded as well as dirty change room, air locks for bag removal and decontamination chambers.]

3.2.16 Site Inspection

While performing asbestos engineering control work, the Contractor must be subject to on-site inspection by the Contracting Officer 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 Contracting Officer or his representative will issue a stop work order to be in effect immediately and until the violation is resolved. All related costs including standby time required to resolve the violation must be at the Contractor's expense.

3.3 CLEAN-UP AND DISPOSAL

3.3.1 Housekeeping

Essential parts of asbestos dust control are housekeeping and clean-up procedures. 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 waste from being distributed over the general area. Use HEPA filtered vacuum cleaners. DO NOT BLOW DOWN THE SPACE WITH COMPRESSED AIR. When asbestos removal is complete, all asbestos waste is removed from the work-site, and final

clean-up is completed, the Contracting Officer will attest that the area is safe before the signs can be removed. After final clean-up and acceptable airborne concentrations are attained but before the HEPA unit is turned off and the enclosure removed, remove all pre-filters on the building HVAC system and provide new pre-filters. Dispose of filters as asbestos contaminated materials. Reestablish HVAC mechanical, and electrical systems in proper working order. The Contracting Officer will visually inspect all surfaces within the enclosure for residual material or accumulated dust or debris. The Contractor must re-clean all areas showing dust or residual materials. If re-cleaning is required, air sample and establish an acceptable asbestos airborne concentration after re-cleaning. The Contracting Officer must agree that the area is safe in writing before unrestricted entry will be permitted. The Government must have the option to perform monitoring to determine if the areas are safe before entry is permitted.

3.3.2 Title to Materials

All waste materials, except as specified otherwise, become the property of the Contractor and must be disposed of as specified in applicable local, State, and Federal regulations and herein.

3.3.3 Disposal of Asbestos

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NOTE: Disposal procedures and sites for asbestos materials vary considerably with each location. Contact local station Public Works and the NAVFAC Engineering Field Division Hazardous Waste Manager or Industrial Hygienist for local procedures.

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3.3.3.1 Procedure for Disposal

Coordinate all waste disposal manifests with the Contracting Officer and NAVFAC EV. Collect asbestos waste, contaminated waste water filters, asbestos contaminated water, scrap, debris, bags, containers, equipment, and asbestos contaminated clothing which may produce airborne concentrations of asbestos fibers and place in sealed fiber-proof, waterproof, non-returnable containers (e.g. double plastic bags 0.15 mm 6 mils thick, cartons, drums or cans). Wastes within the containers must be adequately wet in accordance with 40 CFR 61-SUBPART M. Affix a warning and Department of Transportation (DOT) label to each container including the bags or use at least 0.15 mm 6 mils thick bags with the approved warnings and DOT labeling preprinted on the bag. Clearly indicate on the outside of each container the name of the waste generator and the location at which the waste was generated. Prevent contamination of the transport vehicle (especially if the transport vehicle is a rented truck likely to be used in the future for non-asbestos purposes). These precautions include lining the vehicle cargo area with plastic sheeting (similar to work area enclosure) and thorough cleaning of the cargo area after transport and unloading of asbestos debris is complete. Dispose of waste asbestos material at an Environmental Protection Agency (EPA) or State-approved asbestos landfill off Government property. For temporary storage, store sealed impermeable bags in asbestos waste drums or skids. An area for interim storage of asbestos waste-containing drums or skids will be assigned by the Contracting Officer or his authorized representative. Comply with 40 CFR 61-SUBPART M, State, regional, and local standards for hauling and disposal. Sealed plastic bags may be

dumped from drums into the burial site unless the bags have been broken or damaged. Damaged bags must remain in the drum and the entire contaminated drum must be buried. Uncontaminated drums may be recycled. Workers unloading the sealed drums must wear appropriate respirators and personal protective equipment when handling asbestos materials at the disposal site.

3.3.3.2 Asbestos Disposal Quantity Report

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NOTE: Normal practice is to have the Contractor hire one independent Private Qualified Person (the PQP) to perform all required functions. However, some applicable laws forbid this approach and will dictate when the PQP, the GC or both will be required to perform the function involved. However, the Contractor must always hire a PQP.

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[Direct the PQP to record and report, to the Contracting Officer, the amount of asbestos containing material removed and released for disposal. Deliver the report for the previous day at the beginning of each day shift with amounts of material removed during the previous day reported in linear meters or square meters linear feet or square feet as described initially in this specification and in cubic meters feet for the amount of asbestos containing material released for disposal.

][Allow the GC to inspect, record and report the amount of asbestos containing material removed and released for disposal on a daily basis.

] -- End of Section --