



Asbestos Abatement Design Manual for

- *New Hospitals*
- *Replacement Hospitals*
- *Ambulatory Care*
- *Clinical Additions*
- *Energy Centers*
- *Outpatient Clinics*
- *Animal Research Facilities*
- *Laboratory Buildings*

Department of Veterans Affairs

Office of Construction & Facilities Management
Facilities Quality Service (OOCFM1A)
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CHAPTER 1: GENERAL REQUIREMENTS

1.1 PURPOSE

The purpose of this manual is to serve as a guide for Project Managers, Project Designers, Safety Officers, and other involved personnel (hereafter referred to as A/E) for the planning and design of asbestos abatement projects located at Department of Veterans Affairs (VA) facilities.

It is expected that asbestos abatement projects designed with the use of this manual will comply with all applicable public laws, federal regulations, executive orders, state regulations, local regulations, and all applicable codes. No deviation from these directives is permitted.

1.1.1 EDITOR'S NOTES

Editor's notes are provided in sections of the Asbestos Master Specifications. These notes are presented as either indented sections directly following a section that requires input from the A/E regarding specific information for that section. This can be information such as, but not limited to: state and local regulations that will apply to that specific project; choices between appropriate actions for different types of work tasks; or filling out of specific information required for that specification section.

Additionally, certain sections of the specifications have the following symbols: // before and after sections that need to be reviewed and either modified with specific site conditions, or regulations that will apply to that specific project.

The A/E should make use of the Editor's notes to tailor the specifications to the specific requirements of their project.

1.2 RESPONSIBILITY

The A/E shall provide all necessary professional services to perform the planning and design of the asbestos abatement project. The A/E is responsible and liable for the professional design in accordance with the contract, asbestos abatement best practices, VA standards, VA project-specific requirements if any, and all applicable regulations and standards.

A/E firms do not often carry the necessary liability and pollution prevention insurance coverage for asbestos abatement projects. The insurance coverage may be obtained through use of an asbestos abatement contractor who will perform the asbestos abatement. The subcontractor's insurance coverage for the asbestos abatement shall be sufficient to cover the project's abatement needs.

1.3 REGULATORY OVERSIGHT AUTHORITY

The authority having regulatory oversight for asbestos abatement projects shall be the government agency which regulates the process being undertaken. For asbestos abatement, the agencies can include OSHA, EPA, DOT, and state regulatory agencies.

The VA representative for the building which is the subject of the asbestos abatement project has jurisdiction at the project level.

1.4 COORDINATION

The A/E shall coordinate planning and design work for asbestos abatement projects with all affected parties within the building which is the subject of the abatement project. These parties may consist of: departmental supervisors for areas of the building where asbestos abatement is to take place; patient facilities which must remain occupied during abatement activities; any equipment or services which must remain operational during the course of abatement; and any other person, equipment or services which must remain un-interrupted during the course of the abatement project.

Specific parties that should be consulted with when coordinating projects at a VA building are:

- VA Medical Center Director
- Building Safety Department
- Building Industrial Hygiene Department
- Building Infection Control Department

1.5 VA DESIGN CRITERIA

Pertinent standards of VA's Office of Construction and Facilities Management Technical Information Library (TIL). Some of the major standards are:

1.5.1 MASTER SPECIFICATIONS

Located in the Technical Information Library

Purpose

Defines a standardized method for the A/E to assure that the contractors provide services that meet the design intent in terms of performance, regulatory compliance and quality.

1.5.2 DESIGN AND CONSTRUCTION PROCEDURES

Located in the Technical Information Library.

Purpose

Establishes minimum consistent design/construction practices

The Procedures section accomplishes this by:

- Referencing applicable codes and regulations
- Describing standard drawing formats

- Listing security strategies
- Including miscellaneous design details

1.5.3 DESIGN MANUALS

Additional design manuals may need to be consulted during the design of asbestos projects. Additional design manuals for other disciplines are located in the Technical Information Library. Coordination with these other design manuals is encouraged and necessary in order to encompass all aspects of asbestos design projects.

Purpose

To convey the general and specific VA design philosophy for medical and support facilities.

The Manuals accomplish this purpose by:

- Explaining specific design methodologies
- Referencing certain sections of the Master Specification and Standard Details
- Containing examples of certain design elements
- Listing and defining certain regulatory and standards interpretations

Note: The A/E shall submit to VA a list of Design Manuals along with the TIL posted dates that were in effect on date of contract award.

1.5.4 DESIGN GUIDES

Located in Technical Information Library

Purpose

Provides the A/E with specific layout templates and medical equipment lists for all types of spaces/uses, and specific design parameters for structural, electrical and mechanical services which may be present in the areas affected by the project.

The Design Guides accomplish this by:

- Publishing design narrative
- Including functional diagrams and layout plates
- Listing Standards

1.5.5 DESIGN SUBMISSION REQUIREMENTS

Located in Architect/Engineer Information

Purpose

To provide a staged listing of tasks in various design categories as a way to define the A/E scope in order to assure thorough and timely completion of the final design package and bid documents.

The Instructions accomplish this purpose by:

- Progressively listing tasks such as Design Development, and Construction Documents stages
- Requiring task completion and submission for each stage according to a Critical Path Method (CPM) calendar
- Implementation of a QA/QC process to assure a quality design product
- Indicating the final distribution of bid documents

1.5.6 ARCHITECT/ENGINEER REVIEW CHECKLISTS

Located in Technical Information Library

Purpose

Provides the VA Peer Reviewer with a minimum list of critical items, which must be included in each A/E submission.

The Checklist accomplishes this by:

- Referring to all applicable VA design tools which apply to the specific project
- Detailing certain Life Safety and coordination requirements

1.5.7 DESIGN ALERTS

Located in Technical Information Library

Purpose

Communicates current design issues and solutions

The Design Alerts accomplish this by:

- Publishing periodic alert memos
- Summarizing design solutions

1.5.8 QUALITY ALERTS

Located in Technical Information Library

Purpose

Communicates quality deficiencies from recent A/E design submissions

The Quality Alerts accomplish this by:

- Publishing checklists of design details often missed
- Including references to technical resources

1.5.9 PHYSICAL SECURITY DESIGN MANUAL FOR VA FACILITIES – MISSION CRITICAL FACILITIES & LIFE SAFETY PROTECTED FACILITIES

Located in Technical Information Library

Purpose

Sets physical security standards for facilities required to continue operation during a natural or man-made event, and for facilities that are required to protect the life safety of patients and staff in an emergency.

The Manuals accomplish this by:

- Sets objectives for physical security
- Provides strategies for use in design and construction to provide protection to VA facilities
- Provides cost effective design criteria

Additionally, protective steps must be taken to ensure that all personnel within the building, including those in life safety protected areas will be able to safely egress the building in the case of any emergency, be a natural or man-made event.

1.5.10 COMPUTER AIDED FACILITIES MANAGEMENT REQUIREMENTS (CAFM)

VA intends to implement Computer Aided Facilities Management (CAFM) systems in all new and replacement hospital construction, and in all existing hospitals as feasible. The CAFM concept requires that all pertinent data regarding a building be contained in a master digital database, accessible by facilities personnel at their workstations for use in operations, maintenance, planning modifications in building infrastructure due to space utilization changes, renovations, select demolition or other circumstances that may affect their building.

The CAFM system should be consulted, if it exists in the building which is the subject of the project to assist in creation of Computer Aided Design (CAD) drawings for the project, management of the building during the project, movement of furniture or other

equipment before, during and after the project, and any other manner that would facilitate the planning and execution of the project for the building.

1.6 OTHER DESIGN CRITERIA

1.6.1.1 New Construction

New construction, whether it is the construction of a completely new building, or the construction of a new addition to an existing building, requires the consideration of certain criteria during the creation of the design project documents.

These criteria include:

- In the case of construction of a new building, are there any existing environmental conditions, specifically asbestos, which may affect the construction project? If so, these conditions must be addressed prior to the construction process, as feasible, to minimize impact to the construction. If suspect or new asbestos-containing materials are identified during construction, they will be addressed as needed. It is crucial to project scope, schedule, and budget that every effort be made to identify asbestos-containing materials prior to construction activities commencing. These findings should be incorporated into the asbestos design of each project.
- In the case of a new addition to an existing building, are there asbestos materials that will be affected during the construction of the addition? If so, the asbestos abatement must be designed to remove the impacted materials as feasible to minimize impact to the construction of the addition.
- An investigation must be performed, in the form of an asbestos inspection, of the areas to be affected by the new construction or addition to the building to determine the types and amounts of asbestos that may be impacted by the proposed new construction.
- The results of the investigation will be incorporated into the asbestos abatement project design for the building.

1.6.1.2 Major Renovations

If the total area of renovation to be performed in the building is greater than 50% of the total area of the building, it will be defined as a Major Renovation.

When a major renovation is to occur in a VA building, certain criteria should be considered during the creation of the design project documents.

These criteria include:

- The exact areas of the renovation of the building must be determined prior to designing the asbestos abatement project. This is to determine all areas to be affected by the renovations, and to determine which materials have the potential to be affected by the renovations to the building. Keep in mind that affected

areas may be outside of the footprint of the renovation area, such as floors above and below as well as adjacent areas.

- In some cases, an investigation must be performed, in the form of an asbestos inspection of the areas to be affected by the renovations to the building to determine the types and amounts of asbestos that may be impacted by the proposed renovation(s).
- The results of the investigation will be incorporated into the asbestos abatement project design for the building.

1.6.1.3 Minor Renovations

If the total area of renovation to be performed in the building is less than that of a major renovation project and is not part of standard operations and maintenance work, it will be defined as a Minor Renovation.

When a minor renovation is to occur in a VA building, certain criteria should be considered during the creation of the design project documents.

These criteria include:

- The exact areas of the renovation of the building must be determined prior to designing the asbestos abatement project. This is to determine all areas to be affected by the renovations, and to determine which materials have the potential to be affected by the renovations to the building. Keep in mind that affected areas may be outside of the footprint of the renovation area, such as floors above and below as well as adjacent areas.
- In some cases, an investigation must be performed, in the form of an asbestos inspection of the areas to be affected by the renovations to the building to determine the types and amounts of asbestos that may be impacted by the proposed renovation(s).
- The results of the investigation will be incorporated into the asbestos abatement project design for the building.

1.6.1.4 Demolition

Demolition is defined by EPA NESHAP as: the wrecking or taking out of any load-supporting structural member and any related razing, removing, or stripping of asbestos products. The VA definition of Total Demolition is stated as: a building or substantial part of a building is completely removed, torn or knocked down, bulldozed, flattened, or razed, including removal of building debris.

The complete or partial demolition of an existing VA building must incorporate an asbestos abatement project design to address any asbestos materials in the building which must be removed from the building prior to demolition activities.

The removal of certain types of asbestos materials from a building which is subject to total demolition is required under federal regulations, state regulations as well as local laws when applicable.

Certain criteria must be taken into account when designing the asbestos abatement project for the building to be demolished. Since a raze permit most always requires proof of an asbestos inspection, these assessment activities should occur as early as possible in the design process.

These criteria include:

- Assessment of all asbestos materials located within the building to be demolished. This may be done by using or in conjunction with existing information from the building (such as previous inspections or abatement records) so long as the documents are complete and historic assessments comply with regulatory requirements. A thorough investigation of the building must be performed, in the form of an asbestos inspection, prior to the commencement of any demolition activities.
- The asbestos inspection must identify all types and amounts of asbestos existing in the building prior to demolition (complete demo as well as interior demo). The inspection must account for all affected areas of the work to be performed. Special attention should be focused on areas such as wall chases, interstitial spaces and other often overlooked areas that may contain asbestos materials which may be uncovered during demolition activities.
- The information obtained from the asbestos inspection must be incorporated into the asbestos abatement project design to address all asbestos materials that must be removed from the building prior to demolition.
- Upon successful completion of the asbestos abatement project, the building may proceed to be demolished.

1.6.1.5 Non-Recurring Maintenance (NRM)

Non recurring maintenance (NRM) is maintenance work which is not part of the ongoing operations and maintenance work in the building. NRM would consist of work such as: emergency repair of damaged piping systems or other non-standard maintenance work as needed within a VA building.

NRM has the potential to disturb ACM materials especially in such cases as steam heating systems, HVAC systems, or other systems within the affected building.

In cases of NRM where ACM materials are likely to be encountered, if an existing ACM inventory is not available, a targeted ACM inspection will need to be performed to assess the affected materials. This will ensure that any potential ACM materials will be identified and may be designed for abatement prior to the NRM work being performed.

1.7 APPLICABLE STANDARDS

1.7.1 GENERAL

Federal requirements which govern asbestos abatement include, but are not limited to, the following regulations.

Occupational Safety and Health Administration (**OSHA**)

- Title 29 CFR 1926.1101 - Construction Standard for Asbestos
- Title 29 CFR 1910.132 - Personal Protective Equipment
- Title 29 CFR 1910.134 - Respiratory Protection
- Title 29 CFR 1926 - Construction Industry Standards
- Title 29 CFR 1910.20 - Access to Employee Exposure and Medical Records
- Title 29 CFR 1910.1200 - Hazard Communication
- Title 29 CFR 1910.151 - Medical and First Aid

Environmental Protection Agency (**EPA**):

- 40 CFR 61 Subpart A and M (Revised Subpart B) - National Emission Standard for Hazardous Air Pollutants - Asbestos.
- 40 CFR 763.80 - Asbestos Hazard Emergency Response Act (AHERA)

Department of Transportation (**DOT**)

- Title 49 CFR 100 - 185 – Transportation

Standards which govern asbestos abatement activities include, but are not limited to, the following:

- American National Standards Institute (ANSI) Z9.2-79 - Fundamentals Governing the Design and Operation of Local Exhaust Systems Z88.2 - Practices for Respiratory Protection.
- Underwriters Laboratories (UL) 586-90 - UL Standard for Safety of HEPA Filter Units, 7th Edition.

Standards which govern encapsulation work include, but are not limited to the following:

- American Society for Testing and Materials (ASTM)

Standards which govern the fire and safety concerns in abatement work include, but are not limited to, the following:

- National Fire Protection Association (NFPA) 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations.
- NFPA 701 - Standard Methods for Fire Tests for Flame Resistant Textiles and Film.
- NFPA 101 - Life Safety Code

1.7.2 LOCAL REGULATIONS AND CONDITIONS

State requirements and laws, may differ from federal regulations covering asbestos abatement. All applicable state requirements must be consulted when designing the asbestos abatement project. If the state requirements are more stringent than the federal regulations, the more stringent standard shall be used in all cases.

Local requirements and laws may differ from federal and state regulations covering asbestos abatement. All applicable local requirements must be consulted when designing the asbestos abatement project. If the local requirements are more stringent than the federal and state regulations, the more stringent standard shall be used in all cases.

1.8 DESIGN REQUIREMENTS

The following elements are required for all asbestos abatement project designs for VA facilities:

- All project designs must be developed and/or reviewed and approved by an EPA Model Curriculum trained and applicable state accredited Asbestos Project Designer. This is to ensure that all applicable federal, state and local regulations are followed regarding the design of asbestos abatement projects. VA representatives conducting peer review of asbestos designs need not be accredited Asbestos Project Designers.
- All asbestos inspections performed in VA facilities for the purposes of gathering information for the development of the asbestos abatement project design must be performed by EPA Model Curriculum trained and applicable state accredited Asbestos Inspector.
- VA Master Specifications have been developed for typical asbestos abatement work. The appropriate sections shall be edited to meet the project scope of work and specific project requirements.
- The A/E shall carefully coordinate specifications with the drawings so that all work required by the drawings is included in the specifications. Specification content that does not apply to the project shall be deleted.
- The A/E shall modify the existing Master Specifications, when feasible, to address any abatement that is not specifically identified by the VA Master Specifications.

1.9 CRITERIA UNIQUE TO VA

1.9.1 A/E DESIGN SUBMISSION REQUIREMENTS

The VA Program Guide 18-15 identifies instructions for schematics, design development, and construction documents for Major Construction; Major New Facilities, Additions and Renovations (PG 18-15, Volume B); Minor and NMR projects (PG 18-15, Volume C); and Design/Build (PG 18-15, Volume E). These documents provide the

minimum requirements for submissions related to the A/E and provide a clear basis for what is required at each stage of the design.

1.9.2 DRAWINGS

The following criteria must be used when creating drawings to be used in support of the asbestos abatement project.

- Refer to VA Design and Construction Procedures for general drawing requirements.
- Consolidate notes and place them on the right-hand side of the sheet.
- Show scale, compass point, orientation, key plan, title, column grids and numbers, match-lines, room numbers and titles corresponding to the Architectural drawings.
- Clearly identify all locations of materials to be removed during the asbestos abatement project.
- Clearly identify any life-critical systems that exist in abatement areas to ensure that these systems are isolated and not disturbed during the project.

1.9.3 SEQUENCE OF ASBESTOS ABATEMENT DRAWINGS

- Symbols and abbreviations
- Demolition Plans
- Asbestos materials location plans
- Details
- Summary of asbestos material quantities
- Coordination with A/E Design Submission Requirements (PG 18-15).

1.9.4 ABBREVIATIONS AND SYMBOLS

Use only the abbreviations and symbols shown in the VA Standard Details.

1.9.5 PROPRIETARY ITEMS

Do not use trade names or other identifications that identify a product of an individual manufacturer on any project, unless specifically approved and as follows:

- Where necessary to identify existing equipment or systems

CHAPTER 2: GENERAL ASBESTOS ABATEMENT CRITERIA

2.1 REFERENCES

Federal requirements which govern asbestos abatement include, but are not limited to, the following regulations.

Occupational Safety and Health Administration (OSHA)

- Title 29 CFR 1926.1101 - Construction Standard for Asbestos
- Title 29 CFR 1910.132 - Personal Protective Equipment
- Title 29 CFR 1910.134 - Respiratory Protection
- Title 29 CFR 1926 - Construction Industry Standards
- Title 29 CFR 1910.20 - Access to Employee Exposure and Medical Records
- Title 29 CFR 1910.1200 - Hazard Communication
- Title 29 CFR 1910.151 - Medical and First Aid

Environmental Protection Agency (EPA):

- 40 CFR 61 Subpart A and M (Revised Subpart B) - National Emission Standard for Hazardous Air Pollutants - Asbestos.
- 40 CFR 763.80 - Asbestos Hazard Emergency Response Act (AHERA)

Department of Transportation (DOT)

- Title 49 CFR 100 - 185 – Transportation

Standards which govern asbestos abatement activities include, but are not limited to, the following:

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- Underwriters Laboratories (UL) 586-90 - UL Standard for Safety of HEPA Filter Units, 7th Edition.

Standards which govern encapsulation work include, but are not limited to the following:

- American Society for Testing and Materials (ASTM)

Standards which govern the fire and safety concerns in abatement work include, but are not limited to, the following:

- National Fire Protection Association (NFPA) 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations.
- NFPA 701 - Standard Methods for Fire Tests for Flame Resistant Textiles and Film.
- NFPA 101 - Life Safety Code

2.2 DEFINITIONS

2.2.1 Asbestos Containing Material (ACM)

Any material which contains more than one percent asbestos by weight.

2.2.2 Asbestos Hazards Emergency Response Act (AHERA)

Environmental Protection Agency (EPA) regulation which was passed in 1986 and enacted in 1987. AHERA was passed to establish rules and regulations addressing asbestos-containing materials in schools. Specifically, AHERA was designed to address the issues of identifying; evaluating; and controlling ACM in schools. AHERA also established training requirements for asbestos workers such as Inspectors, Project Designers, Management Planners as well as Workers and Supervisors. This was done by creating the EPA Model Accreditation Plan (MAP) which covered training requirements for all disciplines under AHERA.

2.2.3 Asbestos School Hazard Abatement Reauthorization Act (ASHARA)

EPA regulation enacted in 1990 which updated the MAP requirements for all disciplines except for Management Planners. ASHARA also required that any inspectors, designers or workers/supervisors conducting asbestos activities in public and commercial buildings to be trained and accredited under the MAP.

2.2.4 Amended Water

Water to which a surfactant (wetting agent) has been added to increase the penetrating ability of the liquid.

2.2.5 Authorized Person

Any person authorized by the VA, the Contractor, or government agency and required by work duties to be present in regulated areas.

2.2.6 Area Sampling

Collection of ambient air via an air sampling pump, onto an air sampling cartridge to evaluate the concentration of asbestos fibers in the air of the area being sampled.

2.2.7 Asbestos

Includes chrysotile, amosite, crocidolite, tremolite asbestos, anthophyllite asbestos, actinolite asbestos, and any of these minerals that have been chemically treated or altered. Asbestos also includes PACM, as defined below.

2.2.8 Asbestos Control Area

Also known as the Regulated Area - An OSHA term defined in 29 CFR 1926.1101 meaning an area established by the Contractor to demarcate areas where Class I, II, III asbestos work is conducted; also any adjoining area where debris and waste from such asbestos work accumulates; and an area within which airborne concentrations of

asbestos exceed, or there is a reasonable possibility they may exceed the permissible exposure limit.

2.2.9 Asbestos Fibers

A particulate form of asbestos, 5 microns or longer, with a length to width ratio of at least 3 to 1.

2.2.10 Asbestos Permissible Exposure Limit (PEL)

The level at which a person can be exposed to a concentration of asbestos fibers in air over an eight (8) hour, time-weighted average. As defined by OSHA, the PEL is <0.1 fibers per cubic centimeter (cc) of air.

2.2.11 Background

An air sample collected from the asbestos abatement project area, prior to commencement of work to evaluate the existing levels of asbestos fibers present in the air. This allows for documentation of existing conditions prior to the commencement of work.

2.2.12 Building Inspector (AHERA)

A person who is trained and accredited under the EPA MAP as stated in AHERA/ASHARA, and is qualified to perform asbestos inspections of schools, public and commercial buildings for the purpose of evaluating the presence and quantity of asbestos in these properties. They are also the only persons qualified to collect asbestos samples. They may also be state licensed if applicable in the state of the asbestos project.

2.2.13 Class I Asbestos Work

Activities involving the removal of Thermal System Insulation (TSI) and surfacing ACM and Presumed Asbestos Containing Material (PACM).

2.2.14 Class II Asbestos Work

Activities defined by OSHA involving the removal of ACM which is not thermal systems insulation or surfacing material. This includes, but is not limited to, the removal of asbestos-containing wallboard, floor tile and sheeting, roofing and siding shingles, and construction mastic.

2.2.15 Class III Asbestos Work

Activities defined by OSHA that involve repair and maintenance operations, where ACM, including TSI and surfacing ACM, is likely to be disturbed. Operations may include drilling, abrading, cutting of holes, cable pulling, etc, where asbestos is actively disturbed or asbestos-containing debris is disturbed.

2.2.16 Class IV Asbestos Work

Maintenance and custodial construction activities during which employees contact, but do not disturb ACM and activities to clean-up dust, waste and debris resulting from Class I, II or III activities. This may include dusting surfaces where ACM waste and debris and accompanying dust exists and cleaning up loose ACM debris from TSI or surfacing ACM following construction.

2.2.17 Contractor's Professional Industrial Hygienist (CPIH/CIH)

The asbestos abatement contractor's industrial hygienist. The industrial hygienist must meet the qualification requirements of a PIH and may be a certified industrial hygienist (CIH).

2.2.18 Contractor

Individual who supervises asbestos abatement work and has EPA MAP Contractor/Supervisor training, and has EPA/State certification as a Contractor/Supervisor.

2.2.19 Competent Person

In addition to the definition in 29 CFR 1926.32(f), one who is 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, as specified in 29 CFR 1926.32(f); in addition, for Class I and II work who is specially trained in a training course which meets the criteria of Has EPA MAP, as stated in AHERA/ASHARA, Contractor/Supervisor training and EPA/state certification as a Contractor/Supervisor..

2.2.20 Critical Barrier

The barrier responsible for isolating the regulated area from adjacent spaces, typically constructed of plastic sheeting secured in place at openings such as doors, windows, or any other opening into the regulated area.

2.2.21 Decontamination Area

An enclosed area adjacent to and connected to the regulated area and consisting of an equipment room, shower room, and clean room, which is used for the decontamination of workers, materials, and equipment that are contaminated with asbestos.

2.2.22 Demolition

EPA NESHAP - The wrecking or taking out of any load-supporting structural member and any related razing, removing, or stripping of asbestos products.

VA Total - means a building or substantial part of a building is completely removed, torn or knocked down, bulldozed, flattened, or razed, including removal of building debris.

2.2.23 Disposal Bag

Typically 6 mil thick sift-proof, dustproof, leak-tight container used to package and transport asbestos waste from regulated areas to the approved landfill. Each bag/container must be labeled/marked in accordance with EPA, OSHA and DOT requirements.

2.2.24 Encapsulation

Treating ACM with a liquid that, after proper application, surrounds or embeds asbestos fibers in an adhesive matrix to prevent fiber release.

2.2.25 Encapsulants

Materials used for encapsulation of asbestos. They are defined as either penetrating (where the encapsulant penetrates the material and seals it inside the covering) or bridging (where the encapsulant is applied to the outside of the material to seal the asbestos inside).

2.2.26 Equipment Room or Area

A contaminated room located within the decontamination area that is supplied with impermeable bags or containers for the disposal of contaminated protective clothing and equipment.

2.2.27 Fiber

A fibrous particle, 5 micrometers in length or longer, with a length to width ratio of at least 3 to 1.

2.2.28 Friable Asbestos Material

Any material containing more than 1 percent asbestos as determined using the method specified in appendix A, Subpart F, 40 CFR 763, section 1, Polarized Light Microscopy, that, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure.

2.2.29 Glovebag Technique

Use of a not more than 60 inch by 60 inch, impervious plastic bag-like enclosure affixed around an asbestos-containing material, with glove-like appendages through which material and tools may be handled.

2.2.30 High Efficiency Particulate Air (HEPA) Filter Equipment

An ASHRAE MERV 17 filter capable of trapping and retaining at 99.97% of all mono-dispersed particles or 0.3 micrometer in diameter or more.

2.2.31 Intact

ACM which has not crumbled, been pulverized, or otherwise deteriorated so that the asbestos is no longer likely to be bound with its matrix. Removal of intact asphaltic,

resinous, cementitious products does not render the ACM non-intact simply by being separated in smaller pieces.

2.2.32 Model Accreditation Plan (MAP)

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

2.2.33 Negative Initial Exposure Assessment

A demonstration by the employer which complies with the criteria in 29 CFR 1926.1101 (f)(2)(iii), that employee exposure during an operation is expected to be consistently below the PEL's.

2.2.34 NESHAP

EPA's rule to control emissions of hazardous air pollutants to the environment. Asbestos is defined in NESHAP as a hazardous air pollutant.

2.2.35 Negative Pressure Enclosure (NPE)

An enclosure, constructed of 6 mil poly sheeting, in which asbestos abatement activities take place. The NPE uses HEPA filtered air machines to draw air from outside, into the containment area to create negative pressure. By doing this, if for any reason the containment is breached, air will leak into the work area, rather than from it. This minimizes the risk of a release of asbestos fibers if such a situation arises.

2.2.36 Nonfriable Asbestos Material

Material that contains more than 1 percent asbestos but cannot be crumbled, pulverized, or reduced to powder by hand pressure.

2.2.37 Nonfriable Asbestos Material (Category I)

A NESHAP term defined in 40 CFR 61, Subpart E and EPA 340/1-90/018 meaning asbestos-containing packings, gaskets, resilient floor coverings, and asphalt roofing products containing more than 1 percent asbestos.

2.2.38 Nonfriable Asbestos Material (Category II)

A NESHAP term defined in 40 CFR 61, Subpart E and EPA 340/1-90/018 meaning any material, excluding Category I non-friable ACM containing more than 1 percent asbestos.

2.2.39 Permissible Exposure Limits (PELs)

2.2.39.1 PEL – Time Weighted Average

An airborne concentration of asbestos not in excess of 0.1 fiber per cubic centimeter of air (f/cc) as an 8 hour, time weighted average (TWA)

2.2.39.2 PEL – Excursion Limit

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

2.2.40 Personal Sampling

Representative air samples obtained in the breathing zone of the person using a cassette and battery operated pump to determine asbestos exposure.

2.2.41 Phase Contrast Microscopy (PCM)

Analytical method used for the analysis of asbestos air samples. PCM is defined under the National Institute of Occupational Safety and Health (NIOSH) 7400 Method. PCM is typically performed on-site by the Industrial Hygienist (IH). The PCM method is a fiber counting method and is not definitive for asbestos content.

2.2.42 Polarized Light Microscopy (PLM)

Light microscopy using dispersion staining techniques and refractive indices to identify and quantify the type(s) of asbestos present in a bulk sample.

2.2.43 Presumed ACM (PACM)

Thermal system insulation, surfacing, and flooring material installed in buildings prior to 1981. If the building owner has actual knowledge, or should have known through the exercise of due diligence that other materials are ACM, they too must be treated as PACM. The designation of PACM may be rebutted pursuant to 29 CFR 1926.1101 (b).

2.2.44 Project Designer (AHERA)

A person who is trained and accredited under the EPA MAP as stated in AHERA/ASHARA, and is qualified to design asbestos abatement projects for schools, public and commercial buildings. They may also be state licensed if applicable in the state of the asbestos project.

2.2.45 Qualified Person

A person who is capable of: identifying existing asbestos hazards as defined in OSHA 29 CFR 1926.1101; selecting the appropriate control strategy; and has the authority to take prompt corrective measures to eliminate them. Has EPA MAP, as stated in AHERA/ASHARA, Contractor/Supervisor training and EPA/state certification as a Contractor/Supervisor.

2.2.46 Regulated Area

An area established by the employer to demarcate where Class I, II, III asbestos work is conducted, and any adjoining area where debris and waste from such asbestos work may accumulate; and a work area within which airborne concentrations of asbestos exceed, or there is a reasonable possibility they may exceed the PEL.

2.2.47 Regulated ACM (RACM)

Friable ACM; Category I non-friable ACM that has become friable; Category I non-friable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading or; Category II non-friable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of the demolition or renovation operation.

2.2.48 Removal

All operations where ACM, PACM and/or RACM is taken out or stripped from structures or substrates, including demolition operations.

2.2.49 Renovation

Altering a building or one or more building components in any way, including the stripping or removal of asbestos from a building component which does not involve demolition activity.

2.2.50 Repair

Overhauling, rebuilding, reconstructing, or reconditioning of structures or substrates, including encapsulation or other repair of ACM or PACM attached to structures or substrates.

2.2.51 Surfacing Asbestos Material

A material containing more than 1 percent asbestos that is sprayed, troweled on or otherwise applied to surfaces for acoustical, fireproofing and other purposes.

2.2.52 Thermal System Insulation (TSI) Asbestos Material

A material containing more than 1 percent asbestos applied to pipes, fittings, boilers, breeching, tanks, ducts, or other structural components to prevent heat loss or gain.

2.2.53 Transite

A generic name for asbestos cement materials such as, wallboard, shingles, piping, and other miscellaneous materials.

2.2.54 Transmission Electron Microscopy (TEM)

A microscopy method that can identify and count asbestos fibers.

2.2.55 VA Professional Industrial Hygienist (VPIH/CIH) – The Department of Veterans Affairs Professional Industrial Hygienist must meet the qualifications of a PIH, and may be a Certified Industrial Hygienist (CIH).

2.2.56 Wetting Agent

A material added to water, such as a surfactant which enhances the wetting properties of water when used in asbestos abatement activities.

2.2.57 Worker

A person who is trained and accredited under the EPA MAP as stated in AHERA/ASHARA, and is qualified to work on asbestos abatement projects for schools, public and commercial buildings. They may also be state licensed if applicable in the state of the asbestos project.

2.3 SYSTEM DESCRIPTION

2.3.1 Abatement Work Tasks

The specific ACM to be abated during the asbestos abatement project must be identified on the detailed plan and project drawings. A summary for each work task to be performed during the abatement project, as well as a summary of the techniques to be used, in addition to safety precautions and methods must be included in the design.

2.3.2 Unexpected Discovery of Asbestos

For any previously untested building components suspected to contain asbestos and located in areas to be impacted by the work, additional samples will need to be collected of any materials found to determine the presence or absence of asbestos.

The sampling must be performed by an AHERA accredited Asbestos Building Inspector.

2.3.3 Wallboard/Joint Compound

Composite samples of wallboard/joint compound, or separate samples of the wallboard and joint compound must be collected as part of the pre-abatement asbestos inspection of the building. If this did not occur during the pre-abatement inspection, it must be performed prior to the materials being disturbed during the project.

2.4 SUBMITTALS

Submittals are required prior to the commencement of the asbestos abatement project, throughout the duration of the project, and at project completion or closeout. These submittals are subject to review and acceptance by the VA and/or its representative(s). Specific submittals and timeline references are included within the Master Specifications.

2.5 QUALITY ASSURANCE

2.5.1 Written Qualifications and Organization Report

Contractor must submit to the VA prior to the commencement of the project, a written qualifications and organization report providing evidence of qualifications of the Asbestos Abatement Contractor, Contractor's Project Supervisor, Competent Person, supervisors and workers, independent testing laboratory, all sub-contractors to be used including, disposal transportation and disposal facility firms, sub-contractor supervisors, sub-contractor workers, and any other personnel to be involved in the project. This report must be signed by the principal of the Contracting company.

2.5.2 Specific Requirements

Specific personnel or entities, whose information must be submitted in writing are:

- Asbestos Abatement Contractor; must be licensed/certified in the state in which the project is taking place.
- Competent Person; must be qualified in accordance with 29 CFR 1926.32 and 29 CFR 1926.1101, has EPA MAP Contractor/Supervisor training and who is licensed/certified in the state in which the project is taking place.
- Project and other Supervisors; must have EPA MAP Contractor/Supervisor training and who is licensed/certified in the state in which the project is taking place.
- CPIH - Industrial Hygienist (IH); resume and qualifications for the IH who will be performing oversight duties during the course of the project. All training and licenses must also be included.
- Asbestos Abatement Workers; must have EPA MAP worker training and who are licensed/certified in the state in which the project is taking place.
- Independent Laboratory; identify the independent testing laboratory selected to perform the sample analyses and report the results. The laboratory must be demonstrated to be completely independent of the Contractor. The laboratory must also be accredited under the AIHA NVLAP program.
- Disposal Facility and Transporter; Written evidence that the landfill to be used in approved for asbestos disposal by all applicable federal, state and local agencies. Additionally, the transporter must supply evidence of compliance and licensing with Department of Transportation regulations.

2.5.3 Federal, State or Local Regulations

A copy of all federal, state and local regulations which will apply to the project during the course of the work shall be listed and hard copies of all regulations will be kept on the project site at all times.

2.5.4 Pre-Construction Meeting

The Contractor, and the Contractor's Competent Person, Project Supervisor, and other required personnel shall meet with designated building personnel prior to beginning work at a safety pre-construction meeting to discuss details of site safety, including the preparation of any Accident Prevention Plans (APPs), emergency plans, Asbestos Hazard Abatement Plans (AHAPs) or any other applicable safety documents. Deficiencies of any supplied documents will be discussed and all documents must meet final approval prior to the commencement of work.

2.6 SAFETY

2.6.1 Activity Hazard Analyses (AHAs)

AHAs for each major phase of work shall be submitted and updated during the project. Any time a work task changes or is updated, a new AHA shall be prepared for the new task.

2.7 HAZARD COMMUNICATIONS (HAZCOM)

All personnel on-site for the asbestos abatement project shall be informed of all hazardous materials that they may come in contact with during the course of their duties as per the HAZCOM standard.

2.7.1 Material Safety Data Sheets (MSDSs)

MSDSs shall be maintained on site for all hazardous materials used during the course of the project. All personnel shall be allowed access to the MSDSs within a reasonable timeframe when requested, or if their duties require them to come into contact with, or use these materials, they shall be trained in the materials' proper use.

2.8 SECURITY

Entry into regulated areas shall only be by personnel authorized by the Contractor and the Competent Person. Personnel authorized to enter the regulated areas shall be trained, medically evaluated, and wear the required personal protective equipment (PPE).

2.8.1 Licenses, Permits and Notifications

Obtain necessary licenses, permits and notifications in conjunction with the project's asbestos abatement, transportation, and disposal actions, and times notification of furnished of such actions as required by federal, state, regional, and local authorities.

2.8.2 Regulated Areas

All Class I, II and III asbestos work shall be conducted within regulated areas. The regulated areas shall be demarcated to minimize the number of persons within the area and to protect persons outside the area from exposure to airborne asbestos. The Contractor shall control access to the regulated areas, ensure that only authorized

personnel enter, and verify that Contractor required medical surveillance, training, and respiratory protection program requirement are met prior to allowing entrance.

2.8.3 Warning Signs and Tape

Warning signs and tape shall be provided at the regulated boundaries and entrances to the regulated areas. Signs shall be located to allow personnel to read the signs and take the necessary protective steps required before entering the area.

2.8.4 Warning Labels

Warning labels shall be affixed to all asbestos disposal containers, asbestos materials, scrap, waste debris, and other products contaminated with asbestos. Containers with preprinted warning labels conforming to requirements may be used.

2.9 MEDICAL SURVEILLANCE REQUIREMENTS

Medical surveillance requirement shall conform to 29 CFR 1926.1101. Asbestos workers shall participate in a medical surveillance program that meets 29 CFR 1926.1101 requirements. This requirement must have been satisfied within the last 12 months. All required medical certifications and the Physician's written opinions must be submitted.

2.9.1 Respiratory Protection Program

The Contractor shall establish in writing, and implement a respiratory protection program in accordance with 29 CFR 1926.1101 and 29 CFR 1910.134. The program must establish minimum respiratory protection requirements based on measured or anticipated levels of airborne asbestos fiber concentrations.

2.9.2 Respiratory Fit Testing

Qualitative or quantitative fit tests conforming to Appendix A of 29 CFR 1910.134 must be conducted for each worker required to wear a respirator, and for any authorized visitor who may enter a regulated area where respirators are required. The fit test shall be performed prior to initial use of the respirator, as well as 12 months of the initial fit test thereafter. If any physical changes occur in the fit tested person, which may affect the fit of the respirator, a new fit test must be performed.

2.9.3 Respiratory Selection and Use Requirements

Respirators must be provided and used as required by 29 CFR 1926.1101. Respirators shall be approved by the National Institute of Occupational Safety and Health (NIOSH) for use in environments containing airborne asbestos fibers. The initial respirator selection and the decisions regarding the upgrading or downgrading of the respirator type shall be made based on the measured or anticipated airborne asbestos fiber concentration to be encountered.

2.9.4 Personal Protective Equipment (PPE)

PPE shall be made available to the workers and authorized visitors who will be working in the regulated areas. All users of PPE shall be provided with training in the selection, fitting, and use of PPE and the site safety and health requirements. All affected personnel shall be provided with PPE and monitored for proper use. The Designated Competent Person shall select and approve all required PPE.

2.9.5 Whole Body Protection

2.9.5.1 Coveralls

Disposable, impermeable coveralls with a zipper front shall be provided. Sleeves shall be secured at the wrists, and foot coverings secured at the ankles.

2.9.5.2 Gloves

Gloves shall be provided to protect the hands where there is the potential for hand injuries during the course of designated work tasks.

2.9.5.3 Foot Coverings

Footwear, as required by OSHA, that is appropriate for safety and health hazards in the area shall be worn. Re-usable footwear that is removed from the regulated area shall be thoroughly decontaminated or disposed of as ACM waste.

2.9.5.4 Head Coverings

Hood type disposable head covering shall be provided. Additionally, protective head gear such as hard hats will be provided as required. Re-usable head gear that is removed from the regulated area shall be thoroughly decontaminated or disposed of as ACM waste.

2.9.5.5 Protective Eye Wear

Eye protection shall be provided, when operations present a potential eye injury hazard. Eye protection shall meet all applicable safety standards.

2.10 HYGIENE

Establish a decontamination area for the decontamination of employees, materials and equipment. Ensure that employees enter and exit the regulated area through the decontamination area.

2.10.1 Three (3) Stage Decontamination Area

A decontamination area consisting of three distinct chambers, which is located adjacent to, and opening into the regulated area. The three stage decontamination area consists of the following chambers:

- Equipment Room – used for the storage of equipment and materials used inside the regulated area. The equipment room is located at the entrance of the decontamination area into the regulated area. All equipment and materials used

in the regulated area are left here, prior to employees decontaminating and passing out of the regulated area.

- Shower Room – consisting of a personnel shower for the employees leaving the regulated area. The shower shall contain a drain which is equipped with a filter capable of filtering down to 5 microns so shower water may be filtered to contain asbestos wastes. Hot and cold water shall be provided, along with soap and towels for all personnel.
- Clean Room – the area furthest from the regulated area where the employee exits the shower and proceeds to the outer area prior to leaving the site.

2.10.2 Load-Out Area

A temporary area that is located adjacent to and connected to the regulated area, this is used for large scale load-out of waste materials from the work area. The load-out area shall be attached to the regulated area in a leak-tight manner.

2.10.3 Single Stage Decontamination Area

A decontamination area that is provided for small scale abatement work, this area is typically used in mini-containments where there is no negative pressure present. The area consists of a single chamber, located adjacent to the regulated area where employees, equipment and other materials are decontaminated prior to leaving the work area.

2.10.4 Decontamination Area Exit Procedures

- Before leaving the regulated area, ensure that all gross contamination and debris is removed from work clothing using a HEPA equipped vacuum.
- Protective clothing shall be removed in the equipment room and deposited in supplied waste containers for disposal.
- Respirators shall not be removed until showering is complete.
- A shower must be taken prior to entering the clean room.

2.10.5 Smoking

Smoking, if allowed, shall only be permitted in designated areas of the building. No smoking is allowed in any other area of the building, especially not in the regulated area.

2.11 TRAINING PROGRAM

A training program must be established by the contractor for all employees to perform work on the project site. The training program must meet all requirements of the EPA MAP, as well as any state or local requirements.

Training must be provided under the EPA MAP and state requirements for the following personnel who will be involved in the asbestos abatement project:

- Asbestos Building Inspectors
- Asbestos Management Planners
- Asbestos Project Designers
- Asbestos Contractor/Supervisors
- Asbestos Workers

Additionally, Industrial Hygienists (IHs) must receive additional training as required by NIOSH for PCM analysis of asbestos air samples. This is in addition to the required EPA MAP training they must receive as well.

Prior to commencement of work, the Competent Person shall instruct each person about:

- The hazards and health effects of the specific types of ACM to be encountered on the project site.
- The content and requirements of the Activity Hazard Analyses (AHAs) and Asbestos Hazard Abatement Plan (AHAP) for the site, as well as any site-specific safety and health precautions that may exist.