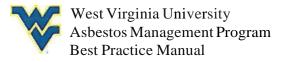
Asbestos Management Program



West Virginia University Morgantown, WV 26506

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1.0 INTRODUCTION

1.1 General

The purpose of WVU's Asbestos Management Program is to reasonably protect employees and building users from potential health hazards associated with asbestos exposures. This Asbestos Operations Manual sets forth the procedures and work practices employed at WVU to manage asbestos containing materials in place until such time WVU possesses the financial resources to remove all asbestos containing materials through alterations, demolition, renovations, and/or repairs.

This manual has been prepared to provide guidance on basic operations and maintenance (O&M) activities involving asbestos containing building materials at West Virginia University. It is based on the *Guidance Manual: Asbestos Operations and Maintenance (O&M) Work Practices* document prepared by a National Institute of Building Sciences (NIBS) committee. The guidance manual was developed under an assistance agreement between NIBS and the U.S. Environmental Protection Agency (EPA) and the General Services Administration (GSA). The manual is modified to reflect West Virginia University procedures.

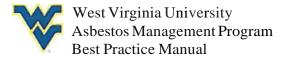
All questions and/or concerns related to this Manual or asbestos in West Virginia University (WVU) buildings should be directed to Environmental Health and Safety at (304) 293-3792.

1.2 Scope and Flexibility

The activities or work practices described in this manual are intended to assist in meeting the current Occupational Safety and Health Administration (OSHA) and EPA regulations applicable to O&M work that involves asbestos-containing material (ACM) or presumed asbestos-containing material (PACM) including; thermal system insulation (TSI), surfacing, resilient flooring, or other miscellaneous asbestos-containing materials.

Work practices in this manual are not intended for asbestos abatement purposes, but rather controlling disturbances of asbestos incidental to repair, maintenance, or cleaning. These activities are, by nature, short in duration and small in scale. The amount of ACM disturbed by any O&M activity should not produce more waste than will fit in a single 60 inch x 60 inch waste bag.

This manual describes work practices with the step-by-step work procedures that should be used by an O&M worker. Because asbestos in buildings is present under widely varying circumstances, flexibility is crucial to the efficient and cost-effective completion of an O&M activity. However, deviations from the O&M Work Practices



described in this manual must be approved by the Asbestos Program Manager (APM).

1.3 Program Parameters

All asbestos O&M work will be performed in accordance with applicable regulations by trained personnel. The WVU Asbestos Management Plan is a guidance document and not intended to be used for regulatory purposes.

1.4 EPA Green Book

The EPA published *Managing Asbestos in Place ("Green Book")* in July 1990. The *Green Book* explains the objectives and administrative procedures for an O&M program. Information presented in the *Green Book* was referenced and used where appropriate during the development of WVUs Asbestos Management Program.

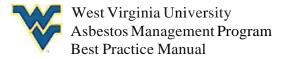
1.5 Statutory & Regulatory Requirements

There are a number of state and federal regulations that must be complied with during O&M operations. The major regulations that affect O&M work are:

- U OSHA Asbestos Construction Standard (CFR 1926.1101), General Industry (CFR 1910.1001), and Respiratory Protection (CFR 1910.134)
- National Emission Standards for Hazardous Air Pollutants (NESHAP)
 (Asbestos Subpart M)
- a EPA Worker Protection Rule (WPR) (40 CFR Part 763)
- th WV Asbestos Abatement Licensing Rule (Title 64, Series 63, 1998)

1.6 EPA Guidance Documents

- a Managing Asbestos In Place ("Green Book") July 1990
- **a** Asbestos in Buildings: Simplified Sampling Scheme for Friable Asbestos Materials ("Pink Book")
- и Guidance for Controlling Asbestos-Containing Materials in Buildings ("Purple Book")
- a A Guide to Respiratory Protection for the Asbestos Abatement Industry ("White Book")



2.0 ELEMENTS OF AN O&M PROGRAM

2.1 Definition of Scope

The types, locations, quantities, and conditions of ACM to be controlled by this program have been determined by inspection and laboratory analysis. These are contained in West Virginia University's O&M binders along with additional information pertaining to materials presumed to contain asbestos. This inventory is accessible through the Environmental Health and Safety department.

2.2 Policy and Organization

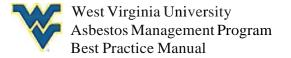
It is the policy of WVU to protect all faculty, staff, students, and visitors from hazardous conditions, including exposures to asbestos fibers. It is the goal of WVU to eliminate asbestos on its campuses. Elimination of asbestos products will be accomplished through abatement and removal at the time of alteration, demolition, renovation, and/or repair. Until that goal is achieved, asbestos will be managed in place in accordance with the WVU Asbestos Operations Manual.

The principal objective of WVU's O&M program is to minimize exposure of all building occupants to asbestos fibers. To accomplish this objective, an O&M program includes work practices to (1) maintain ACM in good condition, (2) ensure proper cleanup of asbestos fibers previously released, (3) prevent further release of asbestos fibers, and (4) monitor the condition of ACM.

Acting as a representative of the President of WVU, the Assistant Vice President for Facilities Management is the overall coordinator of the University's program. A designated representative of Environmental Health and Safety will act as program manager.

2.3 Program Administration

O&M activities shall be tracked by means of standardized "Notification Forms" initiated by West Virginia University O&M personnel.



2.4 Documentation of Regulatory Compliance and Program Effectiveness

Copies of all "Asbestos Abatement Notification Forms" shall be received by the Asbestos Program Manager, or designee, as well as personnel training certificates, air testing results, etc. and retained on file after adjustments are made to West Virginia University's computerized ACM inventory and other databases in a manner that satisfies regulatory requirements.

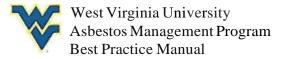
2.5 Restricted Areas & Controlled Systems

2.5.1 Restricted Areas

Where damaged ACM exists in an area to which access can be controlled, disturbance of the ACM can be avoided by restricting this access. The area is designated as "Restricted." Only individuals with the proper training and protective equipment are allowed access into the "Restricted Area". Examples of restricted areas include: spaces above suspended ceilings where there is damaged asbestos-containing fireproofing or pipe insulation, and mechanical areas with damaged ACM.

2.5.2 Controlled Systems

Building systems that contain asbestos are designated as controlled systems. Examples include: pipe insulation, equipment insulation on boilers, breechings, tanks, converters and related equipment that has been identified as containing asbestos. Contact with a "Controlled System" should be allowed only for individuals with the proper training. If the ACM is intact, nonfriable, encapsulated, or enclosed, this training can be as simple as awareness training that informs workers about the locations of the ACM, and that instructs them to avoid disturbing it, and to report any damaged ACM they observe. Work that involves the disturbance or potential disturbance of ACM requires specific work practices (such as those in this manual) applied by individuals with adequate training. The OSHA construction standard, which governs most O&M maintenance activities, requires that, where feasible, labels be affixed to notify employees about ACM or PACM (29 CFR 1926.1101(k)(8)(vii)), but this practice has been found infeasible for most controlled substances at West Virginia University. A sign should be posted at the entrance to all mechanical rooms that contain controlled systems. The



sign should identify the materials present, their location, and appropriate work practices to ensure that the material will not be disturbed. This sort of signage is required by the OSHA construction standard (29 CFR 1926.1101(k)(6)).

2.6 **Training**

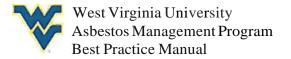
Environmental Health and Safety shall inaugurate and maintain a training program designed to instruct appropriate employees in the handling and control of asbestos. Specific instructions with respect to hazards unique to this work shall be given to all appropriate personnel prior to being assigned to any work involving asbestos. Such training shall be documented to certify that the employee has satisfactorily completed the training program.

Departments shall maintain documentation of asbestos training and training renewals conducted for employees. This documentation (which includes type of training, date, trainer, and employee) shall be submitted to Human Resources and Environmental Health and Safety upon successful completion of the training program.

Departments shall assure that employees do not work with asbestos unless they have been appropriately trained or have received necessary renewal training as described herein.

Each asbestos training program shall include the following information:

- The nature of all health hazards directly attributable to asbestos exposure including carcinogenic hazards;
- The increased risk of lung cancer associated with smoking cigarettes and asbestos exposure;
- a The specific nature of the operations and specific information to aid the employee in recognizing when and where asbestos exposure may result;
- **n** The purpose for and a description of the exposure monitoring program;
- The necessary protective steps to prevent exposure, including engineering controls and safe work practices;
- Where the employee is required to wear a respirator, the purpose for, proper use and limitation of the respiratory devices;



- a Where protective clothing is required, the purpose for, proper use and limitations of protective clothing;
- The purpose for and application of housekeeping and personal hygiene practices and procedures to prevent asbestos exposure to others;
- **a** The purpose for, significance of and familiarization with emergency procedures;
- a Review of the Asbestos Management Program

Annual refresher safety training is required for all workers who are assigned duties which may require them to come into contact with asbestos containing material.

2.6.1 Levels of Training

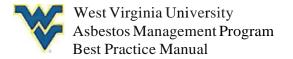
2.6.1.1 Level 1

Training is to be offered to all employees who work in areas determined by WVU Environmental Health and Safety to contain asbestos containing building materials. It is designed to provide awareness training and a general orientation to the subject of asbestos in buildings. Training should focus on the uses and applications of asbestos material in buildings, the locations of such materials, and what steps employees can take to minimize their exposure to asbestos, and to reduce their risk of incurring asbestos related diseases.

2.6.1.2 Level II

Training is targeted at those personnel who perform work in which there is significant potential for exposure to asbestos. This group would include maintenance and other employees who perform services that may bring them in contact with asbestos containing materials. This training should be at a minimum EPA certified worker level.

- the These employees would require, in addition to Level 1 training, instruction in the practical aspects of performing maintenance or repair on asbestos containing materials.
- Service personnel should be taught practical precautions to be followed in removing suspended ceiling panels, installing light or plumbing fixtures, repairing air handling systems or



engaging in any activity that might damage asbestos containing materials.

- They should be given instruction and training in wet cleaning methods and the use of special equipment (i.e., high efficiency particulate air [HEPA] filtered vacuums).
- o They should receive training on removal and disposal procedures; the proper use of personal protective equipment and personal hygiene techniques and information in reporting procedures and compliance with relevant regulations.
- n Training should provide workers with "hands-on" experiences.

2.6.1.3 Level III

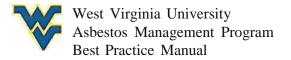
Level III training is advanced training and is designed for those staff and management personnel who have abatement, supervisory, design, inspection or operations and maintenance responsibilities. They are to receive the equivalent of level II training (minimum 40 hour EPA certified supervisor level training) in addition to the requirements outlined in Section 2.6.2, Specific Asbestos Training Programs.

2.6.2 Specific Asbestos Training Programs

2.6.2.1 Asbestos Awareness Training Requirements

An essential part of the Asbestos Management Program is employee training and education. The purpose of the training program is to transmit information to employee and management personnel, and to increase their level of knowledge and awareness in several key areas including:

- 1:1 Diseases that may result from exposure to airborne asbestos, and how these diseases manifest themselves:
- th The concepts of risk and of dose-response relationships, and the role of related factors in the production of diseases, such as smoking;
- the physical characteristics of asbestos -its recognition, mechanisms of dispersion and potential for inhalation;



- a The potential for fiber emissions from work processes and how fiber releases from these processes can be minimized;
- u The purpose and function of engineering and work control practices.

2.6.2.2 Asbestos Worker Training

Requirements are the successful completion of an EPA model asbestos worker course of 4 days duration. The employee must pass the accompanying examination and obtain certification. Additionally the employee must attend an annual refresher course to maintain certification and acquire West Virginia licensing.

2.6.2.3 Asbestos Supervisor Training

Requirements are the successful completion of an EPA model asbestos worker course prior to being certified as an Asbestos Supervisor. Asbestos Supervisor training requires the successful completion of 5 days of training in an EPA model asbestos Supervisor course, passing of the accompanying examination and obtaining of certification. Additionally the supervisor must attend an annual refresher course so as to maintain certification and acquire West Virginia Licensing.

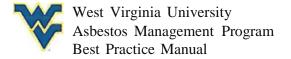
2.6.2.4 Asbestos Inspector Training

Requirements are the successful completion of an EPA model Asbestos Inspector course of a minimum of 21 hours, passing of the accompanying examination and obtaining of certification. Additionally, a *Yi* day annual refresher is required to maintain certification and acquire West Virginia licensing.

2.6.2.5 Asbestos Management Planner

Requirements are the prior completion and certification as an Asbestos Building Inspector (see above), the successful completion of an EPA model course of instruction with a minimum of 14 hours training as an asbestos management planner, passing of the accompanying examination and obtaining of certification.

Additionally an annual refresher course is required to maintain certification and acquire West Virginia licensing.



2.6.2.6 Asbestos Project Designer

Requirements are the successful completion of an EPA model Asbestos Project Designer Course, passing of the accompanying examination and obtaining of certification. Additionally, an annual refresher course is required to maintain certification and acquire West Virginia licensing.

2.6.2.7 Asbestos Final Clearance Monitor

Requirements are the successful completion of an EPA/State of WV Model Air Monitoring course, passing of the accompanying exam, and obtaining of certification. Additionally, an annual refresher course if required to maintain certification and acquire West Virginia licensing.

2.6.2.8 Asbestos Laboratory Requirements

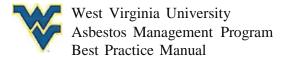
Laboratories providing service to the WVU Asbestos Management Program must be National Voluntary Laboratory Accreditation Program (NVLAP) or American Industrial Hygiene Association (AIHA) certified. Laboratories providing such service must also be licensed by the State of WV Department of Health.

2.7 Notices

2.7.1 Notice to Students, Faculty, Administrators, and Support Staff

In its capacity as property owners and mangers of the State's buildings, WVU at times has a need to communicate important matters concerning health and safety. In that regard, many of the State's public buildings at WVU were constructed at a time when, as standard construction practice, asbestos containing products were used.

WVU has adopted an Asbestos Management Program. Under that Program, WVU has surveyed buildings to identify the type and location of asbestos containing products. WVU has developed and implemented special operations and maintenance programs to avoid unnecessary disturbance or damage to the asbestos containing products found in the buildings.



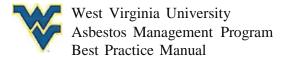
According to the surveys conducted to date, the primary asbestos containing products in WVU buildings include fireproofing which has been sprayed onto the structural steel beams and columns of a few buildings on campus. In most areas of the buildings, the steel beams and columns are accessible only by removal of ceiling panels. Other asbestos containing products in the buildings include acoustical plaster and insulation on certain mechanical equipment and vinyl asbestos floor tile, among others. These products are not generally accessible to occupants or visitors to the building.

Environmental experts retained by the State of West Virginia have advised WVU that it is important to avoid unnecessary disturbance or damage to these asbestos-containing products, because such disturbance or damage could result in a release of asbestos fibers into the air. According to our experts, the health risks associated with asbestos are related to airborne asbestos fibers which can be inhaled. When inhaled, asbestos fibers can cause certain diseases, including lung cancer. Furthermore, health risks are considerably enhanced for smokers who are also exposed to asbestos fibers.

WVU has established special maintenance programs in its buildings to deal with asbestos containing materials. An integral part of the WVU Asbestos Management Program includes the continued monitoring, inspection, and maintenance of all areas of the buildings which have asbestos containing products. Signs shall be posted in some of the buildings indicating the locations of asbestos containing materials that are accessible and capable of being disturbed or damaged. Questions relating to asbestos in buildings should be referred to Environmental Health and Safety at (304) 293-3792.

In order to ensure compliance with the WVU Asbestos Management Program, building occupants and visitors should not attempt any access to areas where the asbestos containing products are located without first contacting Environmental Health and Safety or Facilities for that particular building. In particular, any work that may involve disturbance of asbestos containing materials such as removing ceiling tiles; telephone repair work and/or computer cable installation; changing ceiling light fixtures; or going above the ceiling must not be performed without prior consultation with Environmental Health and Safety and Services. Inaddition, any incidents involving significant changes in the condition of the asbestos containing products, including water leaks, should be reported immediately to Facilities & Services for that building. Care should be taken not to scrape, scratch, or otherwise disturb those asbestos containing materials.

Your cooperation is necessary for the successful implementation of this program. Faculty and administrators should post this notice on bulletin boards where it can be read by employees and others who are working in or visiting your office.



Your cooperation in this effort is appreciated. With your assistance, WVU can continue to successfully address the safety of all occupants and visitors to the State's buildings at WVU.

Sincerely,

Kathy Powell Director, Environmental Health and Safety

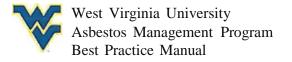
2.7.2 Notice to Contractors, and Equipment Installation and Maintenance Personnel

Concerning Asbestos Containing Products From the State of West Virginia

Based on the recommendations from experts retained by the State of West Virginia, special maintenance policies and procedures are implemented in the State of West Virginia's public buildings to ensure that the asbestos containing products in the buildings are not unnecessarily disturbed or damaged. The WVU Asbestos Management Program generally involves:

- Use of special procedures for abatement, maintenance, repair or cleaning activities involving potential disturbances of asbestos containing products in the State's public buildings.
- Use of specific responses if asbestos containing products are disturbed.
- The training of personnel who will be responsible for the abatement, maintenance, repair or cleaning activities involving access to asbestos containing products.
- The use of special equipment in certain circumstances to protect personnel from excessive exposure to asbestos fibers, and a medical surveillance program for personnel who may be required to work with asbestos containing materials.

According to a survey conducted in the State's Public Buildings, the asbestos containing products in the buildings which may release asbestos fibers are spray-on fireproofing insulation located on the structural steel beams and columns in the building, acoustical plasters sprayed on ceilings, steam pipe insulation, insulation on certain mechanical equipment and vinyl asbestos floor tile, among others. As part of WVU's Asbestos Management Program,

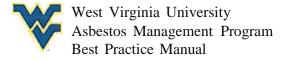


signs should be posted in buildings indicating the locations of asbestos containing materials that are capable of being disturbed or damaged during abatement, maintenance, repair or cleaning by the contractor. The contractor should notify the designated Asbestos Maintenance Supervisor for the building who has been given the responsibility of overseeing the Asbestos Management Program for that particular building, in which abatement, maintenance, repair or cleaning by the contractor is being conducted.

Under WVU's Asbestos Management Program, contractors and other outside personnel are required to comply with the following rules:

- Any abatement, maintenance, renovation, or cleaning activity which as the potential of disturbing asbestos containing products must be approved by Environmental Health and Safety, and performed by personnel who are currently licensed by the State of West Virginia to perform such work.
- Any incidents involving damage to, or significant changes in the condition of asbestos containing products are to be reported immediately to Environmental Health and Safety, the designated Asbestos Maintenance Supervisor for the building and/or the appropriate Planning, Design and Construction representative. Asbestos containing material should be handled <u>only</u> by licensed personnel, according to approved procedures.
- Ifasbestos containing material has been damaged or disturbed, do not try to sweep it up or otherwise disturb it. Disturbing the material in this fashion may have the effect of further spreading the asbestos fibers and/or making them airborne. The disturbed asbestos containing material should be handled only by licensed personnel, according to approved procedures. The area should be secured to prevent further potential contamination.

The WVU Asbestos Operations Manual has been prepared to provide more detailed guidance for personnel and outside contractors who will be working in areas where the asbestos containing products are accessible. If you are going to be involved in work where asbestos containing products may be disturbed, and you have not been provided with guidance from the Manual, contact Environmental Health and Safety, the building's Asbestos Maintenance Supervisor, or Planning, Design, and Construction representative so that appropriate approved guidance can be obtained prior to beginning any work.



If you have any questions regarding this notice, or about any problem that may arise concerning this issue, please contact Environmental Health and Safety at (304) 293-3792.

Sincerely,

Roger L. Pugh Director, Environmental Health and Safety

2.8 Audit and Review

The entire program shall be evaluated annually by the Asbestos Program Manager with regard to: success of work procedures, effectiveness of administrative controls, adequacy of documentation, compliance with current regulations, level of personnel training, and equipment condition.

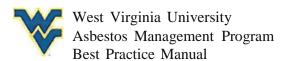
3.0 O&M WORK PRACTICES

3.1 General

The work practices in this manual are designed to reduce or contain material, dust, or fiber release resulting from work performed on or near asbestos-containing materials (ACM). The work practices are also intended to minimize the extent and impact of any releases that do occur. Summaries of each work practice and examples of typical situations that might be encountered are included to assist in the selection of appropriate work practices levels.

The work practices in the manual address most commonly encountered operations and maintenance tasks involving ACM. This manual is not exhaustive and does not document or establish a defined procedure for every possible situation. The manual is formatted to present an array of actual conditions that might be encountered. It establishes a logical path to be followed in selecting the most appropriate work practices(s) for a given situation. O&M workers might also wish to offer suggestions for modifications to specific work practices. Any changes to the work practices shall be reviewed and approved by the Asbestos Program Manager.

Personnel who meet the OSHA-specified requirements to be "competent persons" should review information to determine if a building material that is to be worked on contains asbestos. If the material has not been sampled, it should either be sampled and analyzed in accordance with the EPA Pink and/or Purple Books, or be presumed to contain asbestos (PACM) and treated accordingly. The OSHA regulation (29 CFR



1926.1101) requires that a building or facility owner determine the location of ACM and PACM before any work begins.

3.2 **O&M Program Assumptions**

This O&M Work Practices Manual assumes that all of the elements listed below are considered and that applicable elements are established. Consult the Asbestos Program Manager for more detailed information.

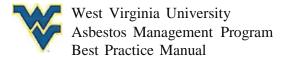
- Asbestos Program Manager appointment and training
- t1 Building inspection assessment
- to Copies of applicable regulations and guidance documents
- 11 Occupant notification/communication program
- a O&M worker, supervisor, and competent person assignments and training program
- Work control/inspection/permit system
- 11 Periodic surveillance program
- a Record keeping program
- 11 Hazard communication program
- Worker protection program (personal protective equipment)
- 11 Respiratory protection program
- ta Medical surveillance program
- Asbestos fiber release episode response program
- 11 Air monitoring program
- 11 Waste disposal program
- a Historical air monitoring data
- safety programs for other hazards

All O&M related programs shall be reviewed periodically and revised if necessary. Regulatory and guidance documents shall also be reviewed periodically to ensure they are current.

33 Organization of Work Practices

The O&M work practices in this guide are grouped according to the type of ACM that will be affected by the work. ACM is classified in this manual according to the three (3) categories used by the EPA. This classification system has been widely used in the asbestos industry since the publication of the Asbestos Hazard Emergency Response Act Rules (AHERA) in 1987. These categories are:

n Surfacing Materials -materials sprayed or troweled onto building surfaces, such as acoustical materials or fireproofing. Drywall systems are not considered Surfacing Materials.



- u Thermal Systems Insulation (TSI) -pipe, boiler, tank, duct and other insulation applied to components to reduce heat loss, heat gain or condensation.
- u Miscellaneous Materials materials such as floor tile, ceiling tile, roofing, cement asbestos products, felt, woven asbestos products, and other materials that are not included in the categories above.

The work practices in this manual are generally designed to address one material at a time. If more than one type of material is involved, work practices should be selected and used in the order in which the materials will be encountered during the work. If two (2) or more materials must be addressed at one time, the O&M designer should develop a combined Work Practice to address the particular work situation.

When developing a combined work practice, the O&M designer should consider the following:

- u The work area should be prepared in accordance with the most precautionary work practice being used.
- u Once the work area is prepared and pre-work activities are complete, the detailed work practices should be performed in the order in which materials are encountered.
- 12 Clean up and tear down procedures should also follow the most precautionary work practice being used.

When work is to be performed, the final work practice decisions should be given to workers. Repetition of certain steps in different work practices is intentional in order to provide consistent and complete information to a worker for a given work practice.

4.0 DESIGN OF O&M WORK PRACTICES

The design of the O&M work practices takes the goals of the program into consideration.

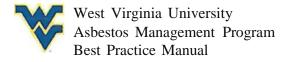
4.1 Environmental And Worker Exposure Goals

The established personal exposure limit to airborne asbestos levels is equivalent to 0.01 fibers per cubic centimeter of air by PCM (EPA Purple Book).

A workers' exposure may not exceed the OSHA PEL or Excursion Limit during execution of O&M work practices (0.1 *flee* by PCM as an 8-hour time-weighted average (TWA), and 1.0 *flee* as a 30-minute excursion limit).

4.2 Selecting Work Practices

Work practices from this manual that are closest to conditions in the location where the work will be performed shall be selected. If situations exist that are not covered



by this manual, the O&M designer should develop modified work practices based on the guidelines in this manual and other sources.

The following factors should be considered when modifying a work practice for use in a specific location:

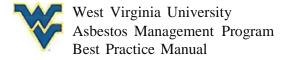
- a Fiber release potential of material or O&M activity
- II Condition and friability of ACM
- Exposure and air monitoring data
- 11 Training, skill and experience of workers
- 1:1 Quantity of ACM to be disturbed
- Type and percentage of asbestos
- Location and use of ACM
- t1 Exposure potential for occupants and other personnel
- state and local regulations
- II O&M and other management policies
- t:1 HVAC and ventilation system configurations
- t1 Presence of on-site supervision
- a Asbestos-containing dust and debris

The work practices are generally designed for working with or around small amounts of asbestos as required to perform O&M tasks. They are generally limited to activities that are within the OSHA Class III limitation, i.e., the ACM to be disturbed fits in one glovebag or disposal bag. This is a fairly large amount of material, and definitive quantities of ACM below this level have not been specified in the work practice level examples. For Class II work, such as flooring or roofing operations, the work practices in the manual are also limited to a small quantity of material.

4.3 Exposure Monitoring

The only way a work practice can be validated is to perform the procedure and simultaneously monitor airborne levels during the work. Under the OSHA standards, personal monitoring is required to determine worker protection requirements and the need for work area isolation. However, Environmental Health and Safety (EH&S) policy prohibits the use of air monitoring as a basis for determine minimum worker protection and enclosure requirements. In addition, area monitoring may be necessary to demonstrate that the remaining building environment is not exposed to elevated asbestos levels. If no disturbance of ACM will occur, monitoring requirements may be minimal or non-existant. Meaningful exposure monitoring requires sufficiently long sample durations. O&M procedures are small in scale and short in duration, requiring many procedures be repeated a number of times to enable the collection of sample with sufficient sensitivity.

OSHA requires employers to determine initially the level of airborne fibers to which an employee will be exposed through an "initial exposure assessment." A "negative



exposure assessment" can be made by use of objective data, historical data from past jobs, or by initial exposure monitoring. (OSHA treats intact removal of resilient flooring differently). OSHA then requires periodic monitoring of construction activities including O&M unless a negative exposure assessment is made, supplied air respirators are used, or statistically reliable measurements indicate that the PEL is not going to be exceeded. Monitoring must be resumed (unless supplied air respirators are used) if there is a change in workers, the activity, or equipment use occurs, which might results in exposures above the permissible exposure limits (PELs). As noted previously, air-monitoring data shall not be used as a basis for the determination of worker protection or as a basis to eliminate the need for negative pressure enclosures, in accordance with EH&S policy.

4.4 Initial Exposure Monitoring

The monitoring specified for an initial exposure assessment is discussed in paragraph (f)(2) of the OSHA construction standard 29 CFR 1926.1101: "(I) Each employer who has a workplace or work operation covered by this standard shall insure that a "competent person" conducts an exposure assessment immediately before or at the initiation of the operation to ascertain expected exposures during that operation or workplace."

4.5 Negative Exposure Assessment (NEA)

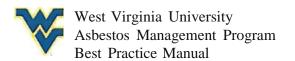
The OSHA construction standard sets forth the criteria that must be met to demonstrate that worker exposures will be below the PEL in 29 CFR 1926.1101(f)(2)(iii). The data must show that exposures are expected to be below the PEL and EL. This evaluation usually occurs during the testing and development phase of an O&M work practice.

The EPA worker protection rule and OSHA govern the employer of the workers performing the O&M work. This means that where West Virginia University employees are performing work on ACM, the supervisor of those employees is responsible for ensuring that the negative exposure assessment is conducted.

If O&M work that disturbs ACM is performed by a contractor rather than by West Virginia University personnel, then West Virginia University must be assured that the contractor is complying with OSHA. WVU Project managers are responsible for assuring that contractors comply with OSHA and EPA regulations.

4.6 Worker Protection

EHS has specified air sampling data shall not be used as a basis for determining when personal protective equipment shall be used. Any activity where there is a potential for disturbance of asbestos containing material shall require the use of approved



respirators and disposable clothing, as appropriate, regardless of the actual or potential airborne exposure.

5.0 USE OF O&M WORK PRACTICES

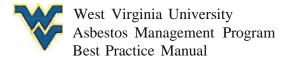
5.1 Lists of Work Practices

Lists of the work practices in this manual are provided at the beginning of each section of work practices. Each work practice includes a summary of the work practice and lists examples of typical situations, general procedures, and certain basic information about the practices. A recommended or required minimum number of workers is also listed for each work practice.

5.2 Using Work Practices

The selection of work practices to be used shall be made by a supervisor who is a "competent person" as defined by OSHA. The process of using work practices for a given situation can be summarized as follows:

- a A competent personal shall evaluate the work to be performed based on existing survey/assessment data, and data on past O&M activities (if available). When reviewing data the following should be determined:
 - a Whether the job requested is actually an asbestos O&M activity
 - 11 The category(ies) of ACM that might be encountered during the work
 - 11 The appropriate work practice(s) to address the situation
 - Personal Protective equipment for the work
- 11 Copies of required information along with the appropriate work practices should be provided to the O&M worker(s). Note that NESHAP requirements apply to a building if the combined additive amount of Regulated Asbestos Containing Material (RACM) that will be removed or stripped in repetitive activities exceeds the quantities specified in NESHAP (260 linear, 160 square, or 35 cubic feet of ACM). Repetitive tasks might increase exposure levels such that more stringent OSHA worker protection and engineering control requirements are triggered. Caution should be used to insure that each of the repeated O&M activities is a discrete O&M activity. O&M work procedures are based on disturbing a small amount of material over a short period of time. Care must be taken to avoid violating the intent by allowing contiguous activities that add up to a larger scale procedure and a potential accumulation of contamination. If a number of O&M activities need to occur at one time in one location, it might be preferable to treat the work as a larger scale, non-O&M activity. The Asbestos Program Manager can set limits appropriate for a facility and O&M program that are based on quantities of ACM to be potentially disturbed in single and multiple O&M activities. Exposure monitoring procedures



and methods for repetitive activities might need to be more stringent than for single activities.

An initial exposure assessment must be made during design of the work practices, and OSHA requires that personal air monitoring (periodic monitoring) be performed for work practices unless employee exposures, as indicated by statistically reliable measurement, are below the OSHA permissible exposure limits. OSHA requires that employees be informed in writing of the results of exposure monitoring either individually or by posting the data in a central location that is accessible to affected employees. Data generated during this periodic monitoring can be used by the Asbestos Program Manager during future development of work practices. O&M activity data shall be kept in strict accordance with the requirements of the OSHA construction standards (29 CFR 1926.1001(n) and 1926.33). The work practice user is responsible for proving compliance with all applicable federal, state and local regulations. Based upon the data obtained, the Asbestos Program Manager or Competent Person may decide to use a higher or lower level of work practice for a specific task. Any data indicating higher exposures than anticipated warrant consideration of moving to higher-level work practices.

MISCELLANEOUS MATERIALS WORK PRACTICES

Mt	Clean asbestos contaminated carpet
M2	Remove asbestos-containing ceiling tiles attached with adhesive or in spline ceiling system
M3	Cut or drill asbestos cement panels
M4	Remove asbestos cement panels, laboratory hoods, countertops, pipe, cooling tower louvers, or ductwork (No Disturbance)
Ms	Modify asbestos-containing fire door and/or door hardware
M6	Remove, cut or drill asbestos-containing plaster or drywall compound (Enclosure Recommended)
M7	Replace as best os-containing gaskets/packing in good condition
MS	Replace asbestos-containing gaskets/packing in poor condition (Enclosure Recommended)
M9	Remove filters from HVAC unit
Mto	Remove asbestos-containing window caulking/glazing compound
Mtt	Replace vehicle brakes or clutch

Mt

Clean asbestos-contaminated carpet

Example

The following are examples of work that can be performed using the procedures of this work practice. If job conditions vary from the examples, stop work and notify your supervisor.

a Clean carpet that has some visual analytical evidence of asbestos contamination.

Buildings

The following buildings are examples where these work practices can be applied.

- a Towers
- a Admissions and Records

Guidelines

- a Generally, only one trained asbestos worker is necessary to complete the scope of this work practice.
- a An employee with asbestos awareness training can clean potentially asbestoscontaminated carpet that has no visible contamination or analytical confirmation of asbestos contamination; ACM in room is in good condition.
- a This work practice describes procedures that can be used to HEPA vacuum carpet. This can be useful for cleaning small areas (<160 SF) of asbestoscontaminated carpet.
- a This procedure is intended for debris small enough to be HEPA vacuumed. Debris too large to be vacuumed must be carefully removed and placed in proper containment.

Work Procedures

- 1) Obtain and review copies of work order and schedule work.
- 2) The following is a checklist of tools, equipment, and materials recommended to perform the steps outlined below.

Tools, Equipment, and Materials

HEPA vacuum with attachments Asbestos barrier tape Warning signs

- 3) Move tools, equipment, and materials to work area.
- 4) Secure work area
 - a Vacate work area to prevent building occupant exposure
 - u Restrict work area using barrier tape, signage, or partitions.

NOTE: Signage should read 'DANGER' or 'KEEP OUT OF CONSTRUCTION AREA'

u In high occupancy areas, put up a secondary barrier to prevent unauthorized access to work area.

<u>For example</u>: Black plastic, plywood partitions, or locking all doors to work area.

- 5) With HEPA vacuum:
 - u Vacuum contaminated area in parallel passes with each pass overlapping the previous by one half the width of the beater bar
 - **n** Vacuum the area a second time, in the same manner, in passes at right angles to the first passes.
- 6) Return tools, equipment, and remaining materials to storage area.
- 7) Notify supervisor that work is completed and complete documentation.

M2

Remove as bestos-containing ceiling tiles attached with adhesive or in spline ceiling system

Example

The following are examples of work that can be performed using the procedures of this work practice. If job conditions vary from the examples, stop work and notify your supervisor.

- a Remove 20 SF of ACM ceiling tiles that will break during removal.
- tt Remove 20 SF of badly damaged ACM ceiling tiles.

Guidelines

- tt Two or more Asbestos workers are required to complete the scope of this work practice.
- a This work practice covers the O&M procedures for removing a small number of asbestos-containing ceiling tiles attached with adhesive or in spline ceiling system. These most commonly are 12" tiles glued to a substrate such as gypsum board, plaster, or cement. The procedures assume that the tile adhesive does not contain asbestos.

Work Procedures

- I) Obtain and review a copy of the work order and schedule for work.
- 2) The following is a checklist of tools, equipment, and materials recommended to perform the steps outlined below.

Tools, Equipment, and Materials

Utility knife Disposal bags with labels

GFCI's HEPA vacuum with attachments

Extension cords and adapters Respirators

Lockout tags Disposable coveralls

Temporary work lights Disposable towels or wet wipes

Ladder or scaffold for elevated work Asbestos barrier tape

Wet wipes or bucket with clean water

Warning signs

Wire cutters

Garden sprayer

Tin snips Amended water

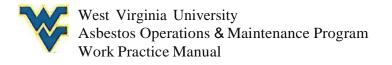
Safety glasses Air monitoring equipment

Polyethylene sheet Duct tape

In the event of a fiber release, see **Appendix D: Procedures for Fiber Release Episodes.**

- 3) Obtain required respirators. The minimum level of respirator for this procedure is a half face air-purifying respirator.
- 4) Move tools, equipment, and materials to work area.
- 5) Secure work area
 - vi Vacate work area to prevent building occupant exposure
 - n Restrict work area using barrier tape, signage, or partitions.

NOTE: Signage should read 'DANGER' or 'KEEP OUT OF CONSTRUCTION AREA"



a In high occupancy areas, put up a secondary barrier to prevent unauthorized access to work area.

<u>For example</u>: Black plastic, plywood partitions, or locking all doors to work area.

6) Lockout electrical systems that may create a hazard during O&M activities.

NOTE: Lockout tags should note when and why power is shut down and the personnel performing the lockout. There should only be one key for each lock used on lockout tags to prevent accidental reactivation of equipment.

- 7) Pre-clean work area if visible dust or debris is present, using one or more of the following techniques.
 - a Pick up dust/debris with HEPA vacuum
 - a Wet wipe non-porous surfaces
 - iii HEPA vacuum surfaces not able to be wiped
 - a Clean carpeting using steam cleaner or HEPA vacuum
- 8) The competent person will determine if the room is to be prepped or a mini enclosure is to be used. Follow (a) and (b) below for prepping the room, or (c) for using a mini enclosure.
 - a) Install critical barriers within work area
 - 111 Close all openings with sheet plastic at least 6 mil thick
 - a Duct tape all cracks
 - a Maintain all seals until the decontamination step is complete
 - a Seal the following with duct tape and polyethylene sheets

Air intakes and returns

Light fixtures (being careful not to burn or melt plastic)

Clocks

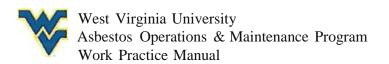
Doorways

Windows

Convectors and speakers

All other openings

- b) Place a polyethylene drop cloth
 - *u* Spread single layer on floor -be sure it covers an area large enough catch falling debris



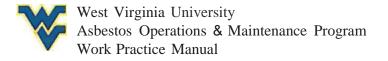
- c Stabilize sheet by using tape or weights
- **a** Use caution not to tear plastic if working on soft flooring (carpet)

CAUTION: Drop cloth introduces a potential slip hazard; non-slip foot coverings are recommended

- c) Set up mini enclosure(s) when engineering and work practices are unable to control asbestos fiber release.
 - **a** Two workers are necessary to set up and perform work in minienclosures
 - After enclosure is inplace, check for, and clean up any debris generated by enclosure installation
 - **a** Use a HEPA vacuum to obtain negative pressure
- 9) Place tools, equipment, and materials needed into the enclosure. Include HEPA vacuum inside the enclosure for vacuuming areas above the ceiling.
- 10) Enter secured work area to put on protective clothing.

NOTE: DO NOT put on disposable Tyvex coveralls in public areas

- **a** Workers are required to wear appropriate PPE as directed by the competent person on site.
- 11) Air monitoring begins at this point.
- 12) Put on respirator and perform fit checks.
- 13) Adequately wet ceiling tiles to be removed.
- 14) Cut away W' of tiles on tongue and grove edges. Pry tile away from substrate to break adhesive bond, remove ceiling tiles and place into disposal bags.
- 15) HEPA vacuum area where tiles were installed.
 - **a** Wet wipe any smooth finished components exposed where tiles were removed.
 - a Use scraper to remove any remaining adhesive or debris.
 - a Place wet wipes and debris into ACM into ACM disposal bags.



- 16) Package and label asbestos waste for disposal.
 - a) Disposal bags should be collapsed by evacuating the air from the bag with the HEPA vacuum in the work area or enclosure.
 - b) Once collapsed, twist the bag to form a neck and wrap it tight with duct tape.
 - c) Fold neck of bag over to form a loop, then again wrap duct tape around neck and loop.

Note: See Appendix B for specific labeling requirements.

- 17) Conduct visual inspection.
 - **a** The person performing the inspection must be a Competent Person.
- 18) Remove drop cloth and/or mini-enclosure and dispose as contaminated asbestos waste.
- 19) Clean tools, equipment, and work area using wet wiping and HEPA vacuuming as appropriate and return tools and equipment to outside work area.
- 20) HEPA vacuum coveralls
 - a) Iftwo disposable coveralls are used:
 - a While wearing respirator, remove outer coveralls in work area
 - Place coveralls in disposal bag
 - a Remove remaining coveralls and place in disposal bag
 - b) Ifone set of coveralls are used:
 - **a** While wearing respirator, HEPA vacuum coveralls while in work area
 - a Remove coveralls and place in disposal bag
 - c) If street clothes are contaminated
 - a HEPA vacuum while in work area
 - a Remove and place in disposal bag
 - 131 Clothes must be disposed of or cleaned as ACM
- 21) Complete personal air monitoring work.
 - 1:1 Stop pump



- it Remove cassette. Be sure to cap all openings
- 151 Complete chain of custody and send to EH&S
- 22) Wash hands, face and respirator while standing in work area
 - Use disposable towels and clean water
 - Wash hands, face and surface of respirator.

INOTE: DO NOT BREAK SEAL BETWEEN FACE AND RESPIRATOR

- 111 Place towels into disposal bag and seal.
- 23) At this point all waste will be double bagged before leaving work area.
- 24) Once all waste is double bagged remove respirator; cleaning and storing according to Respiratory Protection program.
- 25) Return decontaminated tools, equipment, and remaining materials to storage area.
- 26) Remove lockout tags and restart HVAC/electrical system(s).
- 27) Restore normal accessibility to work area.
- 28) Transport waste to designated asbestos waste storage area.
 - Waste should be lifted and carried, or transported in wheeled carts, when moved from one area to another.
 - 1:1 DO NOT DRAG PACKAGED WASTE
 - it Packaged waste should be **PLACED**, NOT THROWN OR DROPPED, into vehicles and storage areas
 - Lock all waste in West Virginia University's asbestos storage facility

Cut or drill asbestos cement panels

Example

The following are examples of work that can be performed using the procedures of this work practice. If job conditions vary from the examples, stop work and notify your supervisor.

a Drill several holes into asbestos cement panel.

Buildings

The following buildings are examples where these work practices can be applied.

- a Physical Plant
- a Percival Hall
- a Clark Hall

Guidelines

- a One Asbestos worker is required to complete the scope of this work practice.
- a Cement asbestos board shall not be cut, drilled, or ground unless the tools are equipped with local exhaust systems filtered through a HEPA filter.

Work Procedures

- 1) Obtain and review a copy of the work order and schedule for work.
- 2) The following is a checklist of tools, equipment, and materials recommended to perform the steps outlined below.

Tools, Equipment, and Materials

Utility knife Disposal bags with labels

GFCI's HEPA vacuum with attachments

Extension cords and adapters Respirators

Wet wipes or bucket with clean water Disposable coveralls

Safety glasses Disposable towels or wet wipes

Polyethylene sheet Asbestos barrier tape

Duct tape

Warning signs

Gordon sprayer

Lockdown encapsulant Garden sprayer
Air monitoring equipment Amended water

In the event of a fiber release, see **Appendix D: Procedures for Fiber Release Episodes.**

- 3) Obtain required respirators. The minimum level of respirator for this procedure is a half face air-purifying respirator.
- 4) Move tools, equipment, and materials to work area.
- 5) Secure work area
 - a Vacate work area to prevent building occupant exposure
 - 11 Restrict work area using barrier tape, signage, or partitions.

NOTE: Signage should read 'DANGER' or 'KEEP OUT OF CONSTRUCTION AREA'

In high occupancy areas, put up a secondary barrier to prevent unauthorized access to work area.

For example: Black plastic, plywood partitions, or locking all doors to work area.

- 6) Pre-clean work area if visible dust or debris is present, using one or more of the following techniques.
 - a Pick up dust/debris with HEPA vacuum
 - tt Wet wipe non-porous surfaces
 - u HEPA vacuum surfaces not able to be wiped
 - n Clean carpeting using steam cleaner or HEPA vacuum
- 7) Place tools, equipment, and materials needed into the work area.
- 8) Enter secured work area to put on protective clothing.

NOTE: DO NOT put on disposable Tyvex coveralls in public areas

- a Workers are required to wear appropriate PPE as directed by the competent person on site.
- 9) Air monitoring begins at this point.
- 10) Put on respirator and perform fit checks.
- 11) Place polyethylene drop cloth below area where work will be performed.
- 12) Carefully cut or drill hole, making sure dust is captured by HEPA vacuum.
- 13) After drilling or cutting is completed, thoroughly decontaminate tools.
- 14) Wet wipe the area surrounding the hole or cut.
- 15) Wet down drop cloth.
 - tt Carefully fold up drop cloth
 - u Place in disposal bag
- 16) Package and label asbestos waste for disposal.
 - *u* Disposal bags should be collapsed by evacuating the air from the bag with the HEPA vacuum in the work area or enclosure.
 - Once collapsed, twist the bag to form a neck and wrap it tight with duct tape.
 - u Fold neck of bag over to form a loop, then again wrap duct tape around neck and loop.

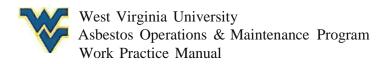


NOTE: See Appendix B for specific labeling requirements.

- 17) Conduct visual inspection.
 - **c** The person performing the inspection must be a Competent Person.
- 18)HEPA vacuum coveralls
 - a) If two disposable coveralls are used:
 - c While wearing respirator, remove outer coveralls in work area
 - 1:1 Place coveralls in disposal bag
 - c Remove remaining coveralls and place in disposal bag
 - b) Ifone set of coveralls are used:
 - c While wearing respirator, HEPA vacuum coveralls while in work area
 - Remove coveralls and place in disposal bag
 - c) Ifstreet clothes are contaminated
 - HEPA vacuum while in work area
 - n Remove and place in disposal bag
 - tl Clothes must be disposed of or cleaned as ACM
- 19) Complete personal air monitoring work.
 - 1:1 Stop pump
 - 151 Remove cassette. Be sure to cap all openings
 - 151 Complete chain of custody and send to EH&S
- 20) Wash hands, face and respirator while standing in work area
 - use disposable towels and clean water
 - Wash hands, face and surface of respirator.

NOTE: DO NOT BREAK SEAL BETWEEN FACE AND RESPIRATOR

- 1:1 Place towels into disposal bag and seal.
- 21) At this point all waste will be double bagged before leaving work area.
- 22) Once all waste is double bagged remove respirator; cleaning and storing according to Respiratory Protection program



- 23) Return decontaminated tools, equipment, and remaining materials to storage area.
- 24) Restore normal accessibility to work area.
- 25) Transport waste to designated asbestos waste storage area.
 - Waste should be lifted and carried, or transported in wheeled carts, when moved from one area to another.
 - a DO NOT DRAG PACKAGED WASTE
 - a Packaged waste should be **PLACED**, NOT THROWN OR DROPPED, into vehicles and storage areas
 - Lock all waste in West Virginia University's asbestos storage facility

Remove asbestos cement panels, laboratory hoods, countertops, pipe, cooling tower louvers or ductwork (No Disturbance)

Example

The following are examples of work that can be performed using the procedures of this work practice. If job conditions vary from the examples, stop work and notify your supervisor.

- a Remove several corrugated or flat asbestos cement panels that are in good condition and have fasteners that can be easily removed without damaging the asbestos cement.
- a Remove section of asbestos cement ductwork that is in good condition and can be removed without damaging the asbestos cement.

Buildings

The following buildings are examples where these work practices can be applied.

- a Chemistry Research Building
- a Percival Hall

Guidelines

- n Two or more asbestos workers are required to complete the scope of this work practice.
- a This work practice covers the procedure for removing less than 160 SF asbestos cement panels or ductwork to support O&M work.

- I) Obtain and review a copy of the work order and schedule for work.
- 2) The following is a checklist of tools, equipment, and materials recommended to perform the steps outlined below.

Tools, Equipment, and Materials

Utility knife HEPA vacuum with attachments

GFCI's Respirators

Extension cords and adapters Disposable coveralls

Lockout tags

Disposable towels or wet wipes

Temporary work lights

Asbestos barrier tape

Ladder or scaffold for elevated work Warning signs

Wet wipes or bucket with clean water Garden sprayer
Safety glasses Amended water

Polyethylene sheet Lockdown encapsulant

Duct tape Air monitoring equipment Disposal bags with labels

- 3) Obtain required respirators. The minimum level of respirator for this procedure is a half face air-purifying respirator.
- 4) Move tools, equipment, and materials to work area.
- 5) Secure work area
 - u Vacate work area to prevent building occupant exposure
 - u Restrict work area using barrier tape, signage, or partitions.

NOTE: Signage should read 'DANGER" or 'KEEP OUT OF CONSTRUCTION AREA"

In high occupancy areas, put up a secondary barrier to prevent unauthorized access to work area.

<u>For example</u>: Black plastic, plywood partitions, or locking all doors to work area.

6) Lockout electrical systems that may create a hazard during O&M activities.

NOTE: Lockout tags should note when and why power is shut down and the personnel performing the lockout. There should only be one key for each lock used on lockout tags to prevent accidental reactivation of equipment.

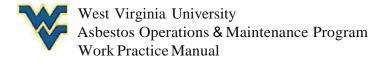
- 7) Pre-clean work area if visible dust or debris is present, using one or more of the following techniques.
 - 11 Pick up dust/debris with HEPA vacuum
 - t1 Wet wipe non-porous surfaces
 - a HEPA vacuum surfaces not able to be wiped
 - clean carpeting using steam cleaner or HEPA vacuum
- 8) The competent person will determine if additional precautions are necessary to protect the health of building occupants and employees.
- 9) Place tools, equipment, and materials needed into the work area.
- 10) Enter secured work area to put on protective clothing.

NOTE: DO NOT put on disposable Tyvex coveralls in public areas

- Workers are required to wear appropriate PPE as directed by the competent person on site.
- 11) Air monitoring begins at this point.
- 12)Put on respirator and perform fit checks.
- 13) Spray amended water on asbestos cement components before starting removal.

NOTE: Maintain in a wet condition throu hoot removal.

- 14) Remove fasteners holding components in place.
- 15) Clean fasteners if they are to be reused.
 - If fasteners will not be reused, dispose of as ACM.
- 16) Remove components.



- 17) Asbestos waste that does not fit into disposal bags should be rapped leak-tight in two layers of 6 mil polyethylene sheet.
 - *ii* Each layer should be sealed tightly with duct tape.
 - *ti* Label outer layer as required by regulations.
- 18) Package and label asbestos waste for disposal.
 - a) Disposal bags should be collapsed by evacuating the air from the bag with the HEPA vacuum in the work area or enclosure.
 - b) Once collapsed, twist the bag to form a neck and wrap it tight with duct tape.
 - c) Fold neck of bag over to form a loop, then again wrap duct tape around neck and loop.

Note: See Appendix B for specific labeling requirements.

- 19) Conduct visual inspection.
 - the person performing the inspection must be a Competent Person.
- 20) Clean tools, equipment, and work area using wet wiping and HEPA vacuuming as appropriate and return tools and equipment to outside work area.
- 21) HEPA vacuum coveralls
 - a) If two disposable coveralls are used:
 - While wearing respirator, remove outer coveralls in work area
 - ¹¹ Place coveralls in disposal bag
 - 11 Remove remaining coveralls and place in disposal bag
 - b) Ifone set of coveralls are used:
 - While wearing respirator, HEPA vacuum coveralls while in work area
 - Remove coveralls and place in disposal bag
 - c) If street clothes are contaminated
 - c HEPA vacuum while in work area
 - n Remove and place in disposal bag
 - rd Clothes must be disposed of or cleaned as ACM



- 22) Complete personal air monitoring work.
 - a Stop pump
 - a Remove cassette. Be sure to cap all openings
 - t1 Complete chain of custody and send to EH&S
- 23) Wash hands, face and respirator while standing in work area
 - t1 Use disposable towels and clean water
 - Wash hands, face, and surface of respirator.

NOTE: DO NOT BREAK SEAL BETWEEN FACE AND RESPIRATOR

- a Place towels into disposal bag and seal.
- 24) At this point all waste will be double bagged before leaving work area.
- 25) Once all waste is double bagged remove respirator; cleaning and storing according to Respiratory Protection program
- 26) Return decontaminated tools, equipment, and remaining materials to storage area.
- 27) Remove lockout tags and restart HVAC/electrical system(s).
- 28) Restore normal accessibility to work area.
- 29) Transport waste to designated asbestos waste storage area.
 - Waste should be lifted and carried, or transported in wheeled carts, when moved from one area to another.
 - a DO NOT DRAG PACKAGED WASTE
 - a Packaged waste should be **PLACED**, NOT THROWN OR DROPPED, into vehicles and storage areas
 - Lock all waste in West Virginia University's asbestos storage facility

Modify asbestos-containing fire door and/or door hardware

Example

The following are examples of work that can be performed using the procedures of this work practice. If job conditions vary from the examples, stop work and notify your supervisor.

- a Remove an asbestos-containing fire door that is in damaged condition.
- a Replace hardware on asbestos-containing fire door in good condition. Hardware penetrates or contacts asbestos core of door.

Buildings

The following buildings are examples where these work practices can be applied.

- a Creative Arts Center
- # Agricultural Sciences Building

Guidelines

- a One Asbestos worker is required to complete the scope of this work practice.
- Fire doors shall not be cut, drilled, or ground unless the tools are equipped with local exhaust systems filtered through a HEPA filter.

- 1) Obtain and review a copy of the work order and schedule for work.
- 2) The following is a checklist of tools, equipment, and materials recommended to perform the steps outlined below.

Tools, Equipment, and Materials

Utility knife Disposal bags with labels
GFCI's HEPA vacuum with attachments
Extension cords and adapters Respirators
Wet wipes or bucket with clean water Disposable coveralls

Safety glasses

Disposable coverains

Disposable towels or wet wipes

Polyethylene sheet Asbestos barrier tape

Duct tape Warning signs
Lockdown encapsulant Garden sprayer
Air monitoring equipment Amended water

In the event of a fiber release, see Appendix D: Procedures for Fiber Release Episodes.

- 3) Obtain required respirators. The minimum level of respirator for this procedure is a half face air-purifying respirator.
- 4) Move tools, equipment, and materials to work area.
- 5) Secure work area
 - a Vacate work area to prevent building occupant exposure
 - u Restrict work area using barrier tape, signage, or partitions.

NOTE: Signage should read "DANGER" or "KEEP OUT OF CONSTRUCTION AREA"

In high occupancy areas, put up a secondary barrier to prevent unauthorized access to work area.

<u>For example</u>: Black plastic, plywood partitions, or locking all doors to work area.



- 6) Pre-clean work area if visible dust or debris is present, using one or more of the following techniques.
 - a Pick up dust/debris with HEPA vacuum
 - Wet wipe non-porous surfaces
 - n HEPA vacuum surfaces not able to be wiped
 - a Clean carpeting using steam cleaner or HEPA vacuum
- 7) Place tools, equipment, and materials needed into the work area.
- 8) Enter secured work area to put on protective clothing.

NOTE: DO NOT put on disposable Tyvex coveralls in public areas

- **a** Workers are required to wear appropriate PPE as directed by the competent person on site.
- 9) Air monitoring begins at this point.
- 10) Put on respirator and perform fit checks.
- 11) Place polyethylene drop cloth below area where work will be performed.
- 12) Carefully cut or drill hole, making sure dust is captured by HEPA vacuum.
- 13) After drilling or cutting is completed, thoroughly decontaminate tools.
- 14) Wet wipe the area surrounding the hole or cut.
- 15) Wet down drop cloth.
 - a Carefully fold up drop cloth
 - 11 Place in disposal bag
- 16) Package and label asbestos waste for disposal.
 - a) Disposal bags should be collapsed by evacuating the air from the bag with the HEPA vacuum in the work area or enclosure.
 - b) Once collapsed, twist the bag to form a neck and wrap it tight with duct tape.
 - c) Fold neck of bag over to form a loop, then again wrap duct tape around neck and loop.

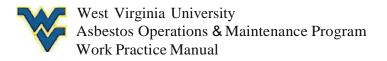


Note: See Appendix B for specific labeling requirements.

- 17) Conduct visual inspection.
 - a The person performing the inspection must be a Competent Person.
- 18)HEPA vacuum coveralls
 - a) If two disposable coveralls are used:
 - a While wearing respirator, remove outer coveralls in work area
 - 11 Place coveralls in disposal bag
 - a Remove remaining coveralls and place in disposal bag
 - b) If one set of coveralls are used:
 - a While wearing respirator, HEPA vacuum coveralls while in work area
 - Remove coveralls and place in disposal bag
 - c) Ifstreet clothes are contaminated
 - 1:1 HEPA vacuum while in work area
 - Remove and place in disposal bag
 - a Clothes must be disposed of or cleaned as ACM
- 19) Complete personal air monitoring work.
 - a Stoppump
 - a Remove cassette. Be sure to cap all openings
 - a Complete chain of custody and send to EH&S
- 20) Wash hands, face and respirator while standing in work area
 - t1 Use disposable towels and clean water
 - Wash hands, face and surface of respirator.

NOTE: <u>DO NOT BREAK SEAL BETWEEN FACE AND RESPIRATOR</u>

- t! Place towels into disposal bag and seal.
- 21) At this point all waste will be double bagged before leaving work area.
- 22) Once all waste is double bagged remove respirator; cleaning and storing according to Respiratory Protection program



- 23) Return decontaminated tools, equipment, and remaining materials to storage area.
- 24) Restore normal accessibility to work area.
- 25) Transport waste to designated asbestos waste storage area.
 - **a** Waste should be lifted and carried, or transported in wheeled carts, when moved from one area to another.
 - a DO NOT DRAG PACKAGED WASTE
 - **a** Packaged waste should be **PLACED**, NOT THROWN OR DROPPED, into vehicles and storage areas
 - c Lock all waste in West Virginia University's asbestos storage facility

M6

Remove, cut or drill asbestos-containing plaster or drywall compound (Enclosure Recommended)**

Example

The following are examples of work that can be performed using the procedures of this work practice. If job conditions vary from the examples, stop work and notify your supervisor.

- Install conduit or ductwork through asbestos-containing dry wall compound using power tools.
- a Replace damaged section of asbestos-containing drywall or drywall adhered to studs using hand tools or power tools with HEPA vacuum dust collection attachments.

Buildings

The following building is an example where these work practices can be applied.

1:1 Allen Hall

Guidelines

- Two or more Asbestos workers are required to complete the scope of this work practice.
- a **Negative pressure containments shall be constructed for this procedure, unless, the erection or installation of a containment is likely to cause more disturbance to the ACM which may result in asbestos fiber release and unnecessary exposure to the worker. If an enclosure cannot be installed, contact the asbestos program manager for alternative work procedures.
- a This work practice is for individual small maintenance activities where the amount of debris involved can be contained in one 60" by 60" disposal bag. It is standard industry practice not to fill these bags more than one-third full to allow for proper sealing and to guard against breakage. If more than this amount of debris is found, stop work and notify your supervisor.

- 1) Obtain and review a copy of the work order and schedule for work.
- 2) The following is a checklist of tools, equipment, and materials recommended to perform the steps outlined below.

Tools. Equipment. and Materials

Utility knife Disposal bags with labels

GFCI's HEPA vacuum with attachments

Extension cords and adapters Respirators

Lockout tags Disposable coveralls

Temporary work lights Disposable towels or wet wipes

Ladder or scaffold for elevated work

Asbestos barrier tape

Warning signs

Wet wipes or bucket with clean water Warning signs
Smoke test bulb and tubes Garden sprayer

Safety glasses Amended water

Polyethylene sheet Lockdown encapsulant
Duct tape Air monitoring equipment

In the event of a fiber release, see Appendix D: Procedures for Fiber Release Episodes.

- 3) Obtain required respirators. The minimum level of respirator for this procedure is a half face air-purifying respirator.
- 4) Move tools, equipment, and materials to work area.
- 5) Secure work area
 - Vacate work area to prevent building occupant exposure
 - Restrict work area using barrier tape, signage, or partitions.

NOTE: Signage should read 'DANGER" or 'KEEP OUT OF CONSTRUCTION AREA"

In high occupancy areas, put up a secondary barrier to prevent unauthorized access to work area.

For example: Black plastic, plywood partitions, or locking all doors to work area.



6) Lockout electrical systems that may create a hazard during O&M activities.

NOTE: Lockout tags should note when and why power is shut down and the personnel performing the lockout. There should only be one key for each lock used on lockout tags to prevent accidental reactivation of equipment.

- 7) Pre-clean work area if visible dust or debris is present, using one or more of the following techniques.
 - a Pick up dust/debris with HEPA vacuum
 - 1:1 Wet wipe non-porous surfaces
 - a HEPA vacuum surfaces not able to be wiped
 - a Clean carpeting using steam cleaner or HEPA vacuum
- 8) The competent person will determine if the room is to be prepped or a mini enclosure is to be used. Follow (a) and (b) below for prepping the room, or (c) for using a mini enclosure.
 - a) Install critical barriers within work area
 - *ii* Close all openings with sheet plastic at least 6 mil thick
 - # Ducttape all cracks
 - Seal the following with duct tape and polyethylene sheets
 - o Air intakes and returns
 - o Light fixtures (being careful not to bum or melt plastic)
 - o Clocks
 - o Doorways
 - o Windows
 - o Convectors and speakers
 - o All other openings
 - Maintain all seals until the decontamination step is completed.
 - b) Place a polyethylene drop cloth
 - Spread single layer on floor-be sure it covers an area large enough catch falling debris
 - *ii* Stabilize sheet by using tape or weights
 - Use caution not to tear plastic if working on soft flooring (carpet)

CAUTION: Drop cloth introduces a potential slip hazard; non-slip foot coverings are recommended

- c) Set up mini enclosure(s) when engineering and work practices are unable to control asbestos fiber release.
 - a Two workers are necessary to set up and perform work in minienclosures
 - **c** After enclosure is in place, check for, and clean up any debris generated by enclosure installation
 - a Use a HEPA vacuum to obtain negative pressure
- 9) Place tools, equipment, and materials needed into the enclosure. Include HEPA vacuum inside the enclosure for vacuuming areas above the ceiling.
- 10) Enter secured work area to put on protective clothing.

NOTE: DO NOT put on disposable Tyvex coveralls in public areas

- **c** Workers are required to wear appropriate PPE as directed by the competent person on site.
- 11) Air monitoring begins at this point.
- 12) Put on respirator and perform fit checks.
- 13)Enter enclosure and adequately wet area of drywall to be removed using garden sprayer with amended water.
- 14) Cut new hole using utility knife, hole saw or drill.
 - a Power tools must have an operating HEPA vacuum attached during cutting.
 - a Wet the cutting area using amended water during cutting or drilling.
- 15) Remove piece of cut drywall and place into disposal bag.
- 16)HEPA vacuum removal area and areas accessible from hole.
- 17) If drywall remains attached to study or substrate, use pry bar to pull sheet out enough so edge can be gripped with hands.
- 18) Mist cavity behind drywall and back side of drywall to be removed with amended water.
- 19) Remove fasteners from studs or substrate and place into disposal bags.



- 20) Clean any debris left on studs or substrate using amended water and nylon brush.
- 21) Pick up any debris and place into disposal bags.
- 22) HEPA vacuum and wet wipe up any dust generated.
- 23) Apply a lockdown encapsulant, where required and as directed by the Competent Person, using an airless garden sprayer, to surfaces where ACM was removed or disturbed.

Note: See Appendix C for detailed Lockdown/Encapsulation Procedures.

- 24) Package and label asbestos waste for disposal.
 - a) Disposal bags should be collapsed by evacuating the air from the bag with the HEPA vacuum in the work area or enclosure.
 - b) Once collapsed, twist the bag to form a neck and wrap it tight with duct tape.
 - c) Fold neck of bag over to form a loop, then again wrap duct tape around neck and loop.
 - d) Place bag in decon.

Note: See Appendix B for Specific Labeling Requirements.

- 25) Conduct visual inspection.
 - The person performing the inspection must be a Competent Person.
- 26) Remove drop cloth and/or mini-enclosure and dispose as contaminated asbestos waste.
- 27) Clean tools, equipment, and work area using wet wiping and HEPA vacuuming as appropriate and return tools and equipment to outside work area.
- 28) HEPA vacuum coveralls
 - a) If two disposable coveralls are used:
 - While wearing respirator, remove outer coveralls in work area
 - 1:1 Place coveralls in disposal bag
 - Enter decon with disposal bag
 - a Remove remaining coveralls and place in disposal bag



- b) Ifone set of coveralls are used:
 - While wearing respirator, HEPA vacuum coveralls while in work area
 - n Enter decon and remove coveralls, place in disposal bag
- c) If street clothes are contaminated
 - n HEPA vacuum while in decon
 - 1:1 Remove and place in disposal bag
 - n Clothes must be disposed of or cleaned as ACM
- 29) Complete personal air monitoring work.
 - t1 Stop pump
 - Remove cassette. Be sure to cap all openings
 - to Complete chain of custody and send to EH&S
- 30) Wash hands, face and respirator while standing in decon
 - 11 Use disposable towels and clean water
 - Wash hands, face and surface of respirator.

NOTE: DO NOT BREAK SEAL BETWEEN FACE AND RESPIRATOR

- n Place towels into disposal bag and seal.
- 31) At this point all waste will be double bagged before leaving decon.
- 32) Once all waste is double bagged remove respirator; cleaning and storing according to Respiratory Protection program
- 33) Return decontaminated tools, equipment, and remaining materials to storage area.
- 34) Remove lockout tags and restart HVAC/electrical system(s).
- 35) Restore normal accessibility to work area.
- 36) Transport waste to designated asbestos waste storage area.
 - **n** Waste should be lifted and carried, or transported in wheeled carts, when moved from one area to another.
 - 13 DO NOT DRAG PACKAGED WASTE
 - Packaged waste should be **PLACED**, NOT THROWN OR DROPPED, into vehicles and storage areas
 - 11 Lock all waste in West Virginia University's asbestos storage facility



Replace asbestos-containing gaskets/packing in good condition

Example

The following are examples of work that can be performed using the procedures of this work practice. If job conditions vary from the examples, stop work and notify your supervisor.

a Remove and replace non-adhering gasket/packing that can be removed intact from steam line pipe union.

Buildings

The following buildings are examples where these work practices can be applied.

- t1 Engineering Sciences Building
- t1 Agricultural Sciences Building

Guidelines

- Generally, only one trained asbestos worker is necessary to complete the scope of this work practice.
- This example is for a situation where the gasket/packing comes out in one piece, and no residue needs to be removed.

- 1) Obtain and review a copy of the work order and schedule for work.
- 2) The following is a checklist of tools, equipment, and materials recommended to perform the steps outlined below.

Tools, Equipment, and Materials

GFCI's

Extension cords and adapters

Lockout tags

Temporary work lights

Ladder or scaffold for elevated work

Flashlight

Safety glasses

Polyethylene sheet

Puddy knife

- 3) Move tools, equipment, and materials to work area.
- 4) Secure work area
 - Vacate work area to prevent building occupant exposure
 - Restrict work area using barrier tape, signage, or partitions.

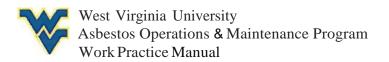
NOTE: Signage should read 'DANGER' or 'KEEP OUT OF CONSTRUCTION AREA"

a In high occupancy areas, put up a secondary barrier to prevent unauthorized access to work area.

For example: Black plastic, plywood partitions, or locking all doors to work area.

5) Lockout electrical systems that may create a hazard during O&M activities.

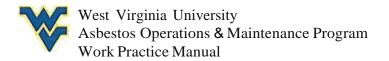
NOTE: Lockout tags should note when and why power is shut down and the personnel performing the lockout. There should only be one key for each lock used on lockout tags to prevent accidental reactivation of equipment.



- 6) Place ladder or scaffold in work area.
- 7) Set up a polyethylene drop cloth beneath the work area, making sure the drop cloth is large enough to catch falling debris.
 - **a** Preparing a work area with a drop cloth requires that a single layer of polyethylene be spread on the floor and taped or weighed down.
 - **o** DO NOT use more than one layer if ladders will be used, unless a hard surface, such as plywood, is laid over the drop cloth.
 - a If the floor is a soft material, use caution to prevent tearing of polyethylene under equipment
- 8) Disassemble equipment as needed to expose entire gasket.
- 9) Lightly mist the gasket before and during disassembly using garden sprayer with amended water.
- 10)Use appropriate tools to remove the gasket intact.
- 11) Clean tools, equipment, and work area using wet wiping and HEPA vacuuming as appropriate and return tools and equipment to outside work area.
- 12) Package and label asbestos waste for disposal.
 - a) Disposal bags should be collapsed by evacuating the air from the bag with the HEPA vacuum in the work area or enclosure.
 - b) Once collapsed, twist the bag to form a neck and wrap it tight with duct tape.
 - c) Fold neck of bag over to form a loop, then again wrap duct tape around neck and loop.
 - d) Place bag in decon.

Note: See Appendix B for specific labeling requirements.

- 13) Return decontaminated tools, equipment, and remaining materials to storage area.
- 14) Remove lockout tags and restart HYAC/electrical system(s).
- 15) Restore normal accessibility to work area.



16) Transport waste to designated asbestos waste storage area.

- Naste should be lifted and carried, or transported in wheeled carts, when moved from one area to another.
 DO NOT DRAG PACKAGED WASTE
- **c** Packaged waste should be <u>**PLACED**</u>, NOT THROWN OR DROPPED, into vehicles and storage areas
- c Lock all waste in West Virginia University's asbestos storage facility

MS

Replace asbestos-containing gaskets/packing in poor condition(Enclosure Recommended)**

Example

The following are examples of work that can be performed using the procedures of this work practice. If job conditions vary from the examples, stop work and notify your supervisor.

- Remove and replace a pipe flange gasket where power tools are required to remove reside of gold gasket/packing.
- n Remove and replace a large friable door hatch gasket that is in poor condition, or other large gaskets in poor condition.

Buildings

The following buildings are examples where these work practices can be applied.

- 11 Church McKee Fine Arts Center (Potomac State College)
- a Steam Tunnels

Guidelines

- n Two or more Asbestos workers are required to complete the scope of this work practice.
- **Negative pressure containments shall be constructed for this procedure, **unless**, the erection or installation of a containment is likely to cause more disturbance to the ACM which may result in asbestos fiber release and unnecessary exposure to the worker. Ifan enclosure cannot be installed, contact the asbestos program manager for alternative work procedures.

- 1) Obtain and review a copy of the work order and schedule for work.
- 2) The following is a checklist of tools, equipment, and materials recommended to perform the steps outlined below.

Tools, Equipment, and Materials

Utility knife HEPA vacuum with attachments

GFCI's Respirators

Extension cords and adapters Disposable coveralls

Lockout tags

Disposable towels or wet wipes

Temporary work lights

Asbestos barrier tape

Ladder or scaffold for elevated work Warning signs

Wet wipes or bucket with clean water

Garden sprayer

Amended water

Safety glasses Amended water

Polyethylene sheet Lockdown encapsulant
Duct tape Air monitoring equipment
Nylon Brush Glovebags (if required)

Disposal bags with label

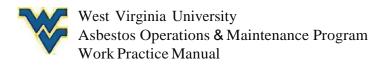
In the event of a fiber release, see Appendix D: Procedures for Fiber Release Episodes.

- 3) Obtain required respirators. The minimum level of respirator for this procedure is a half face air-purifying respirator.
- 4) Move tools, equipment, and materials to work area.
- 5) Secure work area
 - 111 Vacate work area to prevent building occupant exposure
 - u Restrict work area using barrier tape, signage, or partitions.

NOTE: Signage should read 'DANGER' or 'KEEP OUT OF CONSTRUCTION AREA"

a In high occupancy areas, put up a secondary barrier to prevent unauthorized access to work area.

<u>For example</u>: Black plastic, plywood partitions, or locking all doors to work area.



6) Lockout electrical systems that may create a hazard during O&M activities.

NOTE: Lockout tags should note when and why power is shut down and the personnel performing the lockout. There should only be one key for each lock used on lockout tags to prevent accidental reactivation of equipment.

- 7) Pre-clean work area if visible dust or debris is present, using one or more of the following techniques.
 - a Pick up dust/debris with HEPA vacuum
 - a Wet wipe non-porous surfaces
 - 111 HEPA vacuum surfaces not able to be wiped
 - a Clean carpeting using steam cleaner or HEPA vacuum
- 8) The competent person will determine if the room is to be prepped or a mini enclosure is to be used. Follow (a) and (b) below for prepping the room or (c) for using a mini enclosure.
 - a) Install critical barriers within work area
 - a Close all openings with sheet plastic at least 6 mil thick
 - 1:1 Duct tape all cracks
 - 11 Seal the following with duct tape and polyethylene sheets
 - o Air intakes and returns
 - o Light fixtures (being careful not to bum or melt plastic)
 - o Clocks
 - o Doorways
 - o Windows
 - o Convectors and speakers
 - o All other openings
 - Maintain all seals until the decontamination step is completed.
 - b) Place a polyethylene drop cloth
 - Spread single layer on floor -be sure it covers an area large enough catch falling debris
 - stabilize sheet by using tape or weights
 - a Use caution not to tear plastic if working on soft flooring (carpet)

CAUTION: Drop cloth introduces a potential slip hazard; non-slip foot coverings are recommended

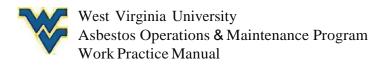
- c) Set up mini enclosure(s) when engineering and work practices are unable to control asbestos fiber release.
 - Two workers are necessary to set up and perform work in minienclosures
 - a After enclosure is in place, check for, and clean up any debris generated by enclosure installation
 - 15 Use a HEPA vacuum to obtain negative pressure
- 9) Place tools, equipment, and materials needed into the enclosure. Include HEPA vacuum inside the enclosure for vacuuming areas above the ceiling.
- 10) Enter secured work area to put on protective clothing.

!NOTE: DO NOT put on disposable Tyvex coveralls in public areasl

- Workers are required to wear appropriate PPE as directed by the competent person on site.
- 11) Air monitoring begins at this point.
- 12) Put on respirator and perform fit checks.
- 13) Enter enclosure and disassemble equipment as needed to expose entire gasket/packing.
- 14) Wet gasket with amended water.

<u>Note:</u> If wetting is not practical due to temperature of pipe or nature of pipe fill, stop work and notify your supervisor.

- 15) Use careful handling and a HEPA vacuum to remove the gasket/packing.
- 16) Carefully scrape gasket from seat while holding nozzle of HEPA vacuum close to the flange or packing box.
- 17)Immediately place pieces of gasket in disposal bags. Attempt to remove gasket in as few pieces as possible.
- 18) Clean residue from surface of seat using wet methods. Keep work site continuously wet.



- 19) Ifnecessary, remove residue with wire brush.
 - Direct stream of removed material into HEPA vacuum attachment.
- 20) HEPA vacuum and wet wipe surfaces to which gasket was attached.
- 21) Apply a lockdown encapsulant, where required and as directed by the Competent Person, using an airless garden sprayer, to surfaces where ACM was removed or disturbed.

Note: See Appendix C for detailed Lockdown/Encapsulation Procedures.

- 22) Package and label asbestos waste for disposal.
 - a) Disposal bags should be collapsed by evacuating the air from the bag with the HEPA vacuum in the work area or enclosure.
 - b) Once collapsed, twist the bag to form a neck and wrap it tight with duct tape.
 - c) Fold neck of bag over to form a loop, then again wrap duct tape around neck and loop.
 - d) Place bag in decon.

Note: See Appendix B for Specific Labeling Requirements.

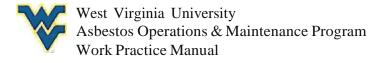
- 23) Conduct visual inspection.
 - The person performing the inspection must be a Competent Person.
- 24) Remove drop cloth and/or mini-enclosure and dispose as contaminated asbestos waste.
- 25) Clean tools, equipment, and work area using wet wiping and HEPA vacuuming as appropriate and return tools and equipment to outside work area.
- 26) HEPA vacuum coveralls
 - a) If two disposable coveralls are used:
 - While wearing respirator, remove outer coveralls in work area
 - 1:1 Place coveralls in disposal bag
 - c Enter decon with disposal bag
 - Remove remaining coveralls and place in disposal bag



- b) Ifone set of coveralls are used:
 - a While wearing respirator, HEPA vacuum coveralls while in work area
 - Enter decon and remove coveralls, place in disposal bag
- c) If street clothes are contaminated
 - HEPA vacuum while in decon
 - 11 Remove and place in disposal bag
 - a Clothes must be disposed of or cleaned as ACM
- 27) Complete personal air monitoring work.
 - 1:1 Stop pump
 - Remove cassette. Be sure to cap all openings
 - to Complete chain of custody and send to EH&S
- 28) Wash hands, face and respirator while standing in decon
 - a Use disposable towels and clean water
 - a Wash hands, face and surface of respirator.

NOTE: DO NOT BREAK SEAL BETWEEN FACE AND RESPIRATOR

- a Place towels into disposal bag and seal.
- 29) At this point all waste will be double bagged before leaving decon.
- 30) Once all waste is double bagged remove respirator; cleaning and storing according to Respiratory Protection program
- 31) Return decontaminated tools, equipment, and remaining materials to storage area.
- 32) Remove lockout tags and restart HVAC/electrical system(s).
- 33) Restore normal accessibility to work area.
- 34) Transport waste to designated asbestos waste storage area.
 - **a** Waste should be lifted and carried, or transported in wheeled carts, when moved from one area to another.
 - t1 DO NOT DRAG PACKAGED WASTE
 - a Packaged waste should be **PLACED**, NOT THROWN OR DROPPED, into vehicles and storage areas
 - a Lock all waste in West Virginia University's asbestos storage facility



Remove filters from HVAC unit

Example

The following are examples of work that can be performed using the procedures of this work practice. If job conditions vary from the examples, stop work and notify your supervisor.

- n Changing of HVAC unit slip-in type filters in for regular maintenance.
- n Removing asbestos-filter in HVAC unit with roll-type filters.

Buildings

The following buildings are examples where these work practices can be applied.

- n Creative Arts Center (Older section)
- n Law Center

Guidelines

n Generally, only one trained asbestos worker is required to complete the scope of this work practice.

- 1) Obtain and review a copy of the work order and schedule for work.
- 2) The following is a checklist of tools, equipment, and materials recommended to perform the steps outlined below.

Tools, Equipment, and Materials

Utility knife HEPA vacuum with attachments

GFCI's Respirators

Extension cords and adapters Disposable coveralls

Lockout tags Disposable towels or wet wipes

Temporary work lights Asbestos barrier tape

Wet wipes or bucket with clean water Warning signs
Safety glasses Garden sprayer

Safety glasses Garden sprayer
Polyethylene sheet Amended water

Duct tape Lockdown encapsulant
Disposal bags with label Air monitoring equipment

- 3) Obtain required respirators. The minimum level of respirator for this procedure is a half face air-purifying respirator.
- 4) Move tools, equipment, and materials to work area.
- 5) Secure work area
 - Vacate work area to prevent building occupant exposure
 - n Restrict work area using barrier tape, signage, or partitions.

NOTE: Signage should read 'DANGER" or 'KEEP OUT OF CONSTRUCTION AREA"

6) Shut down and lockout HVAC system.

NOTE: Lockout tags should note when and why power is shut down and the personnel performing the lockout. There should only be one key for each lock used on lockout tags to prevent accidental reactivation of equipment.

- 7) Pre-clean work area if visible dust or debris is present, using one or more of the following techniques.
 - a Pick up dust/debris with HEPA vacuum
 - ir Wet wipe non-porous surfaces
 - a HEPA vacuum surfaces not able to be wiped
 - a Clean carpeting using steam cleaner or HEPA vacuum
- 8) Place a polyethylene drop cloth.
 - n Spread single layer on floor -be sure it covers an area large enough catch falling debris
 - a Stabilize sheet by using tape or weights
 - a Use caution not to tear plastic if working on soft flooring (carpet)

CAUTION: Drop cloth introduces a potential slip hazard; non-slip foot coverings are recommended

9) Enter secured work area to put on protective clothing.

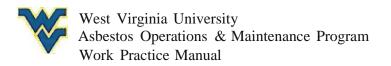
NOTE: DO NOT put on disposable Tyvex coveralls in public areas

- **a** Workers are required to wear appropriate PPE as directed by the competent person on site.
- 10) Air monitoring begins at this point.
- 11) Put on respirator and perform fit checks.
- 12) Carefully remove any necessary hardware to expose filter.

<u>CA</u>UTION: Filters may be extremely dusty, wet methods should be used at all times to prevent unnecessary exposure to worker.

- 13)Once filter is removed, immediately place into disposal bag or wrap in polyethylene.
- 14) Package and label asbestos waste for disposal.

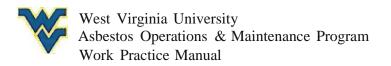
Note: See Appendix B for specific labeling requirements.



- 15) Conduct visual inspection.
 - n The person performing the inspection must be a Competent Person.
- 16) Remove drop cloth and/or mini-enclosure and dispose as contaminated asbestos waste.
- 17)Clean tools, equipment, and work area using wet wiping and HEPA vacuuming as appropriate and return tools and equipment to outside work area.
- 18) HEPA vacuum coveralls
 - a) If two disposable coveralls are used:
 - While wearing respirator, remove outer coveralls in work area
 - n Place coveralls in disposal bag
 - 11 Remove remaining coveralls and place in disposal bag
 - b) Ifone set of coveralls are used:
 - While wearing respirator, HEPA vacuum coveralls while in work area
 - 11 Remove coveralls, place in disposal bag
 - c) If street clothes are contaminated
 - HEPA vacuum while in work area
 - n Remove and place in disposal bag
 - th Clothes must be disposed of or cleaned as ACM
- 19) Complete personal air monitoring work.
 - t1 Stoppump
 - n Remove cassette. Be sure to cap all openings
 - 11 Complete chain of custody and send to EH&S
- 20) Wash hands, face and respirator while standing in work area
 - use disposable towels and clean water
 - Wash hands, face and surface of respirator.

NOTE: DO NOT BREAK SEAL BETWEEN FACE AND RESPIRATOR

a Place towels into disposal bag and seal.



- 21) At this point all waste will be double bagged before leaving work area.
- 22) Once all waste is double bagged remove respirator; cleaning and storing according to Respiratory Protection program
- 23) Return decontaminated tools, equipment, and remaining materials to storage area.
- 24) Remove lockout tags and restart HVAC/electrical system(s).
- 25) Restore normal accessibility to work area.
- 26) Transport waste to designated asbestos waste storage area.
 - Waste should be lifted and carried, or transported in wheeled carts, when moved from one area to another.
 - c DONOT DRAG PACKAGED WASTE
 - Packaged waste should be **PLACED**, NOT THROWN OR DROPPED, into vehicles and storage areas
 - si Lock all waste in West Virginia University's asbestos storage facility

Mio

Remove asbestos-containing window caulking/glazing compound

Example

The following are examples of work that can be performed using the procedures of this work practice. If job conditions vary from the examples, stop work and notify your supervisor.

- 11 Remove a small amount of pliable caulking compound.
- 11 Re-glaze an entire or several windows.

Buildings

The following buildings are examples where these work practices can be applied.

- u Dadisman Hall
- u Roads and Grounds

Guidelines

- the Generally, only one trained asbestos worker is necessary to complete the scope of this work practice.
- This work procedure assumes that all glazing/caulking compound will be removed outside of the building.

- 1) Obtain and review a copy of the work order and schedule for work.
- 2) The following is a checklist of tools, equipment, and materials recommended to perform the steps outlined below.

Tools, Equipment, and Materials

Utility knife HEPA vacuum with attachments

GFCI's Respirators

Extension cords and adapters Disposable coveralls

Ladder or scaffold for elevated work

Disposable towels or wet wipes

Wet wipes or bucket with clean water Asbestos barrier tape

Safety glasses Warning signs
Polyethylene sheet Garden sprayer
Duct tape Amended water

Duct tape Amended water
Disposal bags with label Air monitoring equipment

3) Obtain required respirators. The minimum level of respirator for this procedure is a half face air-purifying respirator.

- 4) Move tools, equipment, and materials to work area.
- 5) Secure work area
 - 111 Vacate work area to prevent building occupant exposure
 - **n** Restrict work area using barrier tape, signage or partitions.

NOTE: Signage should read 'DANGER" or 'KEEP OUT OF CONSTRUCTION AREA"

- In high occupancy areas, put up a secondary barrier to prevent unauthorized access to work area.
- 6) The competent person will direct and determine the proper set up of area, the appropriate PPE, and if respiratory protection is necessary.

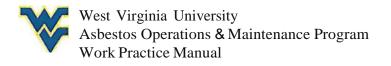
- a) It is recommended to place a polyethylene drop cloth beneath the caulking/glazing that will be removed.
 - Spread single layer on floor -be sure it covers an area large enough to catch falling debris
 - c Stabilize sheet using tape or weights
 - ¹¹ Use caution not to tear plastic if working on soft flooring (grass)

CAUTION: Drop cloth introduces a potential slip hazard; non-slip foot coverings are recommended

- 7) Wet caulking/glazing with amended water.
- 8) Using utility knife or edge of scraper, cut away caulking/glazing and place into disposal bags.
- 9) Remove any residual caulking/glazing using scraper and knife and place into disposal bags.
- 10)HEPA vacuum and/or wet wipe areas where caulking/glazing was removed.
- 11)Perform maintenance work.
- 12)Package and label asbestos waste for disposal.
 - a) Disposal bags should be collapsed by evacuating the air from the bag with the HEPA vacuum in the work area or enclosure.
 - b) Once collapsed, twist the bag to form a neck and wrap it tight with duct tape.
 - c) Fold neck of bag over to form a loop, then again wrap duct tape around neck and loop.

Note: See Appendix B for Specific Labeling Requirements.

- 13) Conduct visual inspection.
 - ¹¹ The person performing the inspection must be a Competent Person.
- 14) Remove drop cloth and dispose as contaminated asbestos waste.
- 15)Clean tools, equipment and work area using wet wiping and HEPA vacuuming as appropriate and return tools and equipment to outside work area.



- 16) HEPA vacuum coveralls
 - a) If two disposable coveralls are used:
 - 14 While wearing respirator, remove outer coveralls in work area
 - 11 Place coveralls in disposal bag
 - a Remove remaining coveralls and place in disposal bag
 - b) If one set of coveralls are used:
 - a While wearing respirator, HEPA vacuum coveralls while in work area
 - n Remove coveralls, place in disposal bag
 - c) If street clothes are contaminated
 - n HEPA vacuum clothes
 - Remove and place in disposal bag
 - rd Clothes must be disposed of or cleaned as ACM
- 17) Complete personal air monitoring work.
 - t1 Stoppump
 - n Remove cassette. Be sure to cap all openings
 - n Complete chain of custody and send to EH&S
- 18) Wash hands, face and respirator.
 - 11 Use disposable towels and clean water
 - n Wash hands, face and surface of respirator.

NOTE: DO NOT BREAK SEAL BETWEEN FACE AND RESPIRATOR

- 1:1 Place towels into disposal bag and seal.
- 19) At this point all waste will be double bagged before leaving work area.
- 20) Once all waste is double bagged remove respirator; cleaning and storing according to Respiratory Protection program
- 21) Return decontaminated tools, equipment, and remaining materials to storage area.
- 22) Restore normal accessibility to work area.

- 23) Transport waste to designated asbestos waste storage area.
 - *ii* Waste should be lifted and carried, or transported in wheeled carts, when moved from one area to another.
 - t1 DO NOT DRAG PACKAGED WASTE
 - Packaged waste should be **PLACED**, NOT THROWN OR DROPPED, into vehicles and storage areas
 - u Lock all waste in West Virginia University's asbestos storage facility

Mtt

Replace vehicle brakes or clutch

Example

The following are examples of work that can be performed using the procedures of this work practice. If job conditions vary from the examples, stop work and notify your supervisor.

- n Remove asbestos-containing brake pads or shoes from a vehicle.
- n Remove a vehicle's wheels to inspect asbestos-containing brake pads or shoes.
- n Remove asbestos-containing clutch pad from a vehicle.

Buildings

The following building is an example where this work practice can be applied.

n Motorpool

Guidelines

- One or more asbestos trained workers are required to complete the scope of this work practice.
- a The onsite competent person may substitute recommended work tasks as necessary to assure safe working practices.
- a This work practice should be used for vehicle maintenance work when asbestos-containing friction products (brake/clutch) are removed or exposed for inspection. Iffriction products in vehicles are not known to be asbestos-free, they must be presumed as asbestos-containing. This work practice utilizes HEPA vacuums and wet methods to control worker exposure to asbestos dust.

- 1) Obtain and review a copy of the work order and schedule for work.
- 2) The following is a checklist of tools, equipment, and materials recommended to perform the steps outlined below.

Tools, Equipment, and Materials

Utility knife HEPA vacuum with attachments

GFCI's Respirators

Extension cords and adapters Disposable coveralls

Temporary work lights Disposable towels or wet wipes

Wet wipes or bucket with clean water Asbestos barrier tape

Safety glasses Warning signs
Polyathylana sheet Garden sprayer

Polyethylene sheet Garden sprayer
Duct tape Amended water

Nylon Brush Air monitoring equipment

Disposal bags with label

In the event of a fiber release, see Appendix D: Procedures for Fiber Release Episodes.

- 3) Obtain required respirators. The minimum level of respirator for this procedure is a half face air-purifying respirator.
- 4) Move tools, equipment, and materials to work area.
- 5) Secure work area
 - Wacate work area to prevent building occupant exposure
 - a Restrict work area using barrier tape, signage or partitions.

NOTE: Signage should read 'DANGER" or 'KEEP OUT OF CONSTRUCTION AREA"

a In high occupancy areas, put up a secondary barrier to prevent unauthorized access to work area.

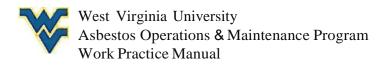
<u>For e</u>xample: Black plastic, plywood partitions, or locking all doors to work area.



- 6) Elevate vehicle as necessary and commence work to the point where friction products will be exposed.
- 7) Remove wheels or clutch housing to expose friction products.
- 8) Select one of the following methods for removal.
 - a) Use HEPA vacuum to collect dust from brake/clutch facing and vehicle components where it may have collected.
 - b) Low Pressure/Wet Cleaning Method:
 - Place catch basin under brake/clutch assembly positioned to avoid splashes and spills.
 - a Spray these materials with a fine mist from garden or hand sprayer.

NOTE: The solution used must be allowed to flow between the brake drum and brake support before the drum is removed. The wheel hub and back of brake assembly must be thoroughly wetted after it is removed as well. The brake support plate, brake shoes, and break components used to attach the brake shoes must be thoroughly washed before removing the old shoes. In systems using filters, the filters when full, shall be first wetted with a fine mist, then removed and placed immediately in a properly labeled impermeable container for disposal as asbestos waste.

- **a** Gently flood materials to prevent dust from becoming airborne, and wipe clean with a cloth.
- **n DO NOT** use dry brush or pressurized air.
- n Any spills or release of materials from the brake clutch assembly must be cleaned up immediately with a HEPA vacuum or by spraying with amended water and wiping with a cloth. Wiping cloths must be disposed as asbestos waste.
- c) Negative Pressure Enclosure/HEPA Vacuum System Method:
 - n A manufactured HEPA vacuum brake enclosure shall be used to provide a containment.
 - a Place necessary tools and necessary replacement components into the enclosure.
 - n Seal and thoroughly inspect the enclosure for leaks. Examine the integrity of sleeves and ports before work begins. The manufacturer will provide specific instructions for accomplishing this.



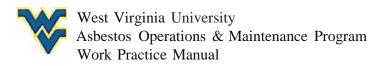
- Tum on the HEPA vacuum and insert arms into the attached sleeves.
- *i:i* Commence work, using the vacuum attachment to remove dust/debris from the brake/clutch surfaces and surrounding components.
- 13 Compressed air may be used inside the enclosure for dislodging debris from surfaces.

NOTE: If any debris falls from the enclosure stop work immediately and refer to Appendix D: Procedures for Fiber Release Episodes.

- a When all residues have been removed from brake/clutch components, use the vacuum to clean the interior surfaces of the enclosure.
- a Perform brake/clutch work as necessary.
- d) Any alternative method developed by the competent person and approved by WVU EH&S.
- 9) Package and label asbestos waste for disposal.
 - a) Disposal bags should be collapsed by evacuating the air from the bag with the HEPA vacuum in the work area or enclosure.
 - b) Once collapsed, twist the bag to form a neck and wrap it tight with duct tape.
 - c) Fold neck of bag over to form a loop, then again wrap duct tape around neck and loop.

Note: See Appendix B for specific labeling requirements.

- 10) Conduct visual inspection.
 - **a** The person performing the inspection must be a Competent Person.
- **11)** Remove drop cloth and/or mini-enclosure and dispose as contaminated asbestos waste.
- 12) Clean tools, equipment, and work area using wet wiping and HEPA vacuuming as appropriate and return tools and equipment to outside work area.
- 13)All waste must be double bagged before leaving the work area.
- 14)Once all waste is double bagged remove respirator; cleaning and storing according to Respiratory Protection program



- 15)Return decontaminated tools, equipment, and remaining materials to storage area.
- 16)Restore normal accessibility to work area.
- 17) Transport waste to designated asbestos waste storage area.
 - **a** Waste should be lifted and carried, or transported in wheeled carts, when moved from one area to another.
 - 11 DO NOT DRAG PACKAGED WASTE
 - n Packaged waste should be <u>PLACED</u>, NOT THROWN OR DROPPED, into vehicles and storage areas
 - 12 Lock all waste in West Virginia University's asbestos storage facility

RESILIENT FLOORING MATERIALS WORK PRACTICES

R1	Removal/Replacement of loose resilient asbestos floor tiles ingood condition (No Disturbance)
R2	Removal/Replacement of resilient asbestos floor tiles in poor condition
Ra	Wet strip floor wax from resilient asbestos flooring (No Disturbance)
R4	Remove carpet over resilient asbestos floor tiles

For procedures for drilling holes into installed resilient asbestos floor tiles, refer to R1 or R2 appropriately

Rt

Removal/replacement of resilient asbestos floor tiles in good condition (No Disturbance)

Example

The following are examples of work that can be performed using the procedures of this work practice. If job conditions vary from the examples, stop work and notify your supervisor.

- a Removal of small quantities of floor tiles that are loose from heat or water damage, where no breakage will occur, and where floor tile mastic is not friable.
- Remove well-adhered tile and/or mastic that is not likely to become friable.
- Remove floor tiles and mastic to drill hole(s) in sub-floor attaching object to floor or installing a pipe.

Buildings

The following buildings are examples where these work practices can be applied.

- a Summit Hall
- a Agricultural Sciences Building

Guidelines

- Generally, only one trained asbestos worker is necessary to complete the scope of this work practice.
- **a** Do not sand, cut or break resilient flooring. Do not use this procedure for activities that crumble, pulverize, or otherwise deteriorate resilient flooring to the extent that it is no longer bound with its matrix.
- a This work procedure is not appropriate if resilient flooring is in a friable condition, or if resilient flooring cannot be removed substantially intact.
- Megative Pressure is not required for this procedure.

- 1) Obtain and review copies of work order and schedule work.
- 2) The following is a checklist of tools, equipment, and materials recommended to perform the steps outlined below.

Tools, Equipment, and Materials

Utility knife Disposal bags with labels

HEPA vacuum with attachments GFCI's

Extension cords and adapters Respirators

Lockout tags Disposable coveralls

Temporary work lights Disposable towels or wet wipes

Wet wipes or bucket with clean water Asbestos barrier tape

Safety glasses Warning signs

Polyethylene sheet Garden sprayer Duct tape Amended water

Heat Gun Air monitoring equipment Flashlight

- 3) Move tools, equipment, and materials to work area.
- 4) Secure work area
 - a Vacate work area to prevent building occupant exposure
 - a Restrict work area using barrier tape, signage or partitions.

NOTE: Signage should read 'DANGER" or 'KEEP OUT OF CONSTRUCTION AREA"

> a In high occupancy areas, put up a secondary barrier to prevent unauthorized access to work area.

For example: Black plastic, plywood partitions, or locking all doors to work area.

5) Remove flooring using one of the following methods.

NOTE: The goal should be to remove individual tiles intact.

HEAT METHOD

a Thoroughly heat the tile(s) with a hot air gun until the heat penetrates through the tile and softens the adhesive.

CAUTION: Over-heating resilient tile might produce harmful vapors, and a respirator with organic vapor cartridges might be needed.

- a Remove tiles by hand or use a scraper.
- a Deposit tiles in a disposal bag or leak-tight container.
- a Wet-scrape residual adhesive and deposit in disposal bag.
- a Asbestos-containing waste material from O&M activities should be adequately wet in accordance with the NESHAP requirements (40 CFR 61.150).

DRY ICE METHOD

CAUTION: The use of dry ice produces carbon dioxide that could result in an oxygen deficient atmosphere in the work area. Dry ice can also cause frostbite to workers and damage building materials.

- a Spread crushed dry ice over tiles to be removed.
- a Let dry ice freeze mastic and release tile.
- a Use short-handled scraper to pry up tiles.
- a Once tile is removed, place (without breaking) into disposal bags or leak-tight containers.
- a Wet-scrape residual adhesive and deposit in disposal bag.
- 6) Remove mastic using one of the following methods.

WET-SCRAPE METHOD

NOTE: After removing tile, always wet-scrape the residual adhesive using the following procedure so no ridges or puddles are evident and what remains is no more than a thin, smooth film.

a Moisten the adhesive with water mixed with liquid dishwashing detergent (to aid in wetting the adhesive).



- a Place loosened adhesive residues into a disposal bag.
- n Wet-vacuum standing water with HEPA wet/dry vacuum.
- a Repeat the above steps until more than athin, smooth film remains.

ADHESIVE REMOVAL SOLUTION

NOTE: If work that could disturb the adhesive residue, such as drilling through the floor, is going to occur, completely remove residue of adhesive left after removal of resilient floor tile using the following procedure.

- **II** Apply adhesive removal solution to the residual adhesive with a hand sprayer or rag.
- **a** Allow the area to soak for 5 to 10 minutes.
- a Scrub the floor with the black pad to the desired degree.
- **a** Wet HEPA vacuum the adhesive slurry or absorb pickup with disposable towels.
- **n** Rinse area with clear clean water using a hand sprayer or mop.
- 1:1 Wet-vacuum water with HEPA wet/dry vacuum.
- **a** Wet-wipe and/or wash down all equipment used.
- 7) Complete observations and necessary work.
- 8) Return tools, equipment, and remaining materials to storage area.
- 9) Notify supervisor that work is completed and complete documentation.
- 10)Restore normal accessibility to work area.
- 11)Transport waste to designated asbestos waste storage area.
 - **a** Waste should be lifted and carried, or transported in wheeled carts, when moved from one area to another.
 - 151 DO NOT DRAG PACKAGED WASTE
 - Packaged waste should be PLACED, NOT THROWN OR DROPPED, into vehicles and storage areas
 - n Lock all waste in West Virginia University's asbestos storage facility

Removal/Replacement of resilient asbestos floor tiles in poor condition

Example

The following are examples of work that can be performed using the procedures of this work practice. If job conditions vary from the examples, stop work and notify your supervisor.

- Remove floor tile and/or mastic in friable condition.
- a Remove floor tile and/or mastic that will become friable during its removal.
- a Remove vinyl sheet flooring with ACM backing which is sufficiently damaged to be friable.
- Remove vinyl sheet flooring with ACM backing which may become friable during removal.
- a Remove vinyl sheet flooring which may become friable during removal to drill hole(s) in sub floor for attaching an object to floor or installing a pipe.

Buildings

The following buildings are examples where these work practices can be applied.

- 111 Engineering Sciences Building
- tı Towers

Guidelines

- a Generally, only one trained asbestos worker is necessary to complete the scope of this work practice.
- Do not sand, cut or break resilient flooring. Do not use this procedure for activities that crumble, pulverize, or otherwise deteriorate resilient flooring to the extent that it is no longer bound with its matrix.

- 1) Obtain and review a copy of the work order and schedule for work.
- 2) The following is a checklist of tools, equipment, and materials recommended to perform the steps outlined below.

Tools, Equipment, and Materials

Utility knife Disposal bags with labels

GFCI's HEPA vacuum with attachments

Extension cords and adapters Respirators

Lockout tags Disposable coveralls

Temporary work lights Disposable towels or wet wipes

Wet wipes or bucket with clean water

Asbestos barrier tape

Safety glasses Warning signs
Polyethylene sheet Garden sprayer

Duct tape Amended water
Heat Gun Air monitoring equipment

Flashlight

- 3) Obtain required respirators. The minimum level of respirator for this procedure is a half face air-purifying respirator.
- 4) Move tools, equipment, and materials to work area.
- 5) Secure work area
 - a Vacate work area to prevent building occupant exposure
 - a Restrict work area using barrier tape, signage or partitions.

NOTE: Signage should read 'DANGER' or 'KEEP OUT OF CONSTRUCTION AREA"

a Inhigh occupancy areas, put up a secondary barrier to prevent unauthorized access to work area

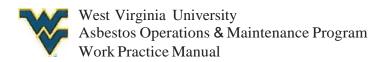
For example: Black plastic, plywood partitions, or locking all doors to work area.

- 6) The competent person will determine if the room is to be. If necessary follow the procedure below for prepping the room.
 - a) Install critical barriers within work area
 - ti Close all openings with sheet plastic at least 6 mil thick
 - ti Ducttape all cracks
 - Seal the following with duct tape and polyethylene sheets
 - a Air intakes and returns
 - er Light fixtures (being careful not to burn or melt plastic)
 - er Clocks
 - 1:1 Doorways
 - a Windows
 - 11 Speakers
 - t1 All other openings
 - 11 Maintain all seals until the decontamination step is completed.
- 7) Place tools, HEPA vacuum, equipment, and materials needed into the work area.
- 8) Enter secured work area to put on protective clothing.

NOTE: DO NOT put on disposable Tyvex coveralls in public areas

- **u** Workers are required to wear appropriate PPE as directed by the competent person on site.
- 9) Air monitoring begins at this point.
- 10) Put on respirator and perform fit checks.
- 11) Use HEPA vacuum to vacuum up all loose material.
- 12) Adequately wet area using garden sprayer with amended water.
- 13) Place broken pieces of flooring too large to be vacuumed into disposal bags
- 14) Remove remaining flooring using one of the following methods.

NOTE: The goal should be to remove individual tiles intact.



HEAT METHOD

Thoroughly heat the tile(s) with a hot air gun until the heat penetrates through the tile and softens the adhesive.

CAUTION: Over-heating resilient tile might produce harmful vapors, and a respirator with organic vapor cartridges might be needed.

- a Remove tiles by hand or use a scraper.
- Deposit tiles in a disposal bag or leak-tight container.
- Wet-scrape residual adhesive and deposit indisposal bag.
- II Asbestos-containing waste material from O&M activities should be adequately wet in accordance with the NESHAP requirements (40 CFR 61.150).

DRY ICE METHOD

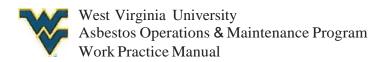
<u>C</u>AUTION: The use of dry ice produces carbon dioxide that could result in an oxygen deficient atmosphere in the work area. Dry ice can also cause frostbite to workers and damage building materials.

- Spread crushed dry ice over tiles to be removed.
- a Let dry ice freeze mastic and release tile.
- a Use short-handled scraper to pry up tiles.
- a Once tile is removed, place (without breaking) into disposal bags or leaktight containers.
- a Wet-scrape residual adhesive and deposit in disposal bag.
- 15) Remove mastic using one of the following methods.

WET-SCRAPE METHOD

NOTE: After removing tile, always wet-scrape the residual adhesive using the following procedure so no ridges or puddles are evident and what remains is no more than a thin, smooth film.

- a Moisten the adhesive with water mixed with liquid dishwashing detergent (to aid in wetting the adhesive).
- Place loosened adhesive residues into a disposal bag.



- Wet-vacuum standing water with HEPA wet/dry vacuum.
- a Repeat the above steps until more than a thin, smooth film remains.

ADHESIVE REMOVAL SOLUTION

NOTE: Ifwork that could disturb the adhesive residue, such as drilling through the floor, is going to occur, completely remove residue of adhesive left after removal of resilient floor tile using the following procedure.

- Apply adhesive removal solution to the residual adhesive with a hand sprayer or rag.
- a Allow the area to soak for 5 to 10 minutes.
- a Scrub the floor with the black pad to the desired degree.
- Wet HEPA vacuum the adhesive slurry or absorb pickup with disposable towels.
- a Rinse area with clear clean water using a hand sprayer or mop.
- Wet-vacuum water with HEPA wet/dry vacuum.
- a Wet-wipe and/or wash down all equipment used.
- 16) Package and label asbestos waste for disposal.
 - a) Disposal bags should be collapsed by evacuating the air from the bag with the HEPA vacuum in the work area or enclosure.
 - b) Once collapsed, twist the bag to form a neck and wrap it tight with duct tape.
 - c) Fold neck of bag over to form a loop, then again wrap duct tape around neck and loop.

Note: See Appendix B for specific labeling requirements.

- 17) Conduct visual inspection.
 - The person performing the inspection must be a Competent Person.
- 18) Clean tools, equipment, and work area using wet wiping and HEPA vacuuming as appropriate and return tools and equipment to outside work area.
- 19) HEPA vacuum coveralls
 - a) If two disposable coveralls are used:
 - th While wearing respirator, remove outer coveralls in work area
 - t1 Place coveralls in disposal bag



- tt Remove remaining coveralls and place in disposal bag
- b) If one set of coveralls are used:
 - a While wearing respirator, HEPA vacuum coveralls while in work area
 - Remove coveralls and place in disposal bag
- c) If street clothes are contaminated
 - a HEPA vacuum while in work area
 - tt Remove and place in disposal bag
 - a Clothes must be disposed of or cleaned as ACM
- 20) Complete personal air monitoring work.
 - tt Stop pump
 - a Remove cassette. Be sure to cap all openings
 - a Complete chain of custody and send to EH&S
- 21) Wash hands, face and respirator in work area.
 - **a** Use disposable towels and clean water
 - **a** Wash hands, face and surface of respirator.

NOTE: DO NOT BREAK SEAL BETWEEN FACE AND RESPIRATOR

- a Place towels into disposal bag and seal.
- 22) At this point all waste will be double bagged before leaving work area.
- 23) Once all waste is double bagged remove respirator; cleaning and storing according to Respiratory Protection program
- 24) Return decontaminated tools, equipment, and remaining materials to storage area.
- 25) Restore normal accessibility to work area.
- 26) Transport waste to designated asbestos waste storage area.
 - a Waste should be lifted and carried, or transported in wheeled carts, when moved from one area to another.
 - a DO NOT DRAG PACKAGED WASTE
 - a Packaged waste should be **PLACED**, NOT THROWN OR DROPPED, into vehicles and storage areas
 - tt Lock all waste in West Virginia University's asbestos storage facility

Cleaning, stripping, waxing, and buffing resilient asbestos flooring

Example

The following are examples of work that can be performed using the procedures of this work practice. If job conditions vary from the examples, stop work and notify your supervisor.

- a Clean or scrub resilient asbestos flooring that is covered with floor polish before buffing or application of additional polish.
- **a** Strip floor wax or finish coat from resilient asbestos flooring that is well-adhered and in good condition.
- **a** Dry or spray-buff the polish on resilient asbestos flooring to remove minor surface imperfections and restore gloss.

Guidelines

- **a** Generally personnel with asbestos awareness training can complete this work practice.
- **a** This procedure is based on EPA recommendations.
- a lfthe employee encounters dust or debris that is suspected to be asbestoscontaining, a Competent Person must evaluate the task to determine if an Asbestos trained worker is necessary to conduct the work.
- a DO NOT clean, strip, wax, or buff loose or damaged resilient flooring. Any damage should be repaired before cleaning begins using the applicable work practice(s). Stop work if any damage occurs during cleaning and make needed repairs.
- **a** Stripping pads should be kept wet during use and rinsed thoroughly, immediately after use and prior to storage.

- 1) Obtain and review copies of work order and schedule work.
- 2) Restrict work area using appropriate signage.

3) **CLEANING**

- a. Mix scrubbing chemical with water as recommended by manufacturer and apply liberal amount (do not flood) using mop.
 - n The scrubbing chemical should not be capable of stripping wax from the floor.
- b. Allow to soak for amount of time recommended by manufacturer.
- c. Keep floor adequately wet by reapplying cleaning solution if drying occurs. Work small areas at a time

4) STRIPPING

The following procedure is based upon EPA's "Recommended Interim Guidelines for Stripping Asbestos-containing Floors (January 25, 1990)"

The Environmental Protection Agency (EPA) recommends that school officials, building owners, and custodial/maintenance staff consider the following basic guidelines when stripping wax or finish coat from asbestos-containing floor coverings:

- 1) **STRIPPING FLOORS.** Stripping floors should be done as infrequently as possible -perhaps once or twice or less per year depending on circumstances.
- 2) **PROPERLY TRAIN STAFF.** Custodial or maintenance staff that strip floors should be trained to operate properly and safely the machines, pads, and floor care chemicals used at the facility.
- 3) FOLLOW APPROPRIATE WORK PRACTICES. Custodial or maintenance staff who strips floors should follow appropriate work practices, such as those recommended here, under informed supervision. Directions from floor tile and floor wax product manufactures on proper maintenance procedures should be consulted.
- 4) **STRIP FLOORS WHILE WET.** The floor should be kept adequately wet during the stripping operation. **DO NOT** perform any dry stripping. Prior to machine operation, an emulsion of chemical stripper in water is commonly

- applied to the floor with a mop to soften the wax or finish coat. After stripping and before application of the new wax, the floor should be thoroughly cleaned while wet.
- 5) **RUN MACHINE AT SLOW SPEED.** If the machine used to remove the wax or finish coat has variable speeds, it should be run at slow speed (about (175-190 rpm) during the stripping operation. Speed should not exceed 300 rpm.
- 6) **SELECT THE LEAST ABRASIVE PAD POSSIBLE.** EPA recommends that the machine be equipped with the least abrasive pad possible to strip wax or finish coat from asbestos-containing floors.
- 7) **DO NOT OVERSTRIP FLOORS.** Stop stripping when the old surface coat is removed. Over stripping can damage the floor and may cause the release of asbestos fibers. **DO NOT** operate a floor machine with an abrasive pad on un-waxed or unfinished floors.

5) **BUFFING**

- a. To spray buff:
 - a Spray small area with spray-buff solution.
 - **a** Buff using manufacturer's recommended pad or brush at recommended RPM.
 - Repeat procedure until entire area is spray-buffed.
- b. To dry-buff:
 - **a** Only dry buff or burnish on asbestos-containing flooring which has sufficient finish.
 - 11 Buff or dry-burnish with manufacturer's recommended pad.
 - Use pad at manufacturer 's recommended RPM.
- 6) Return tools, equipment, and remaining materials to storage area.
- 7) Notify supervisor that work is completed and complete documentation.

Remove carpet over resilient asbestos flooring (No Disturbance)

Example

The following are examples of work that can be performed using the procedures of this work practice. If job conditions vary from the examples, stop work and notify your supervisor.

a Remove carpet that is non-adhered or weakly adhered to resilient asbestos flooring that is well-adhered and in good condition.

Buildings

The following buildings are examples where these work practices can be applied.

- a Stansbury Hall
- t1 Stewart Hall

Guidelines

- Generally, only one trained asbestos worker is necessary to complete the scope of this work practice.
- **a** The procedure assumes that the ACM will not intentionally be disturbed during the work.
- t1 These procedures assume that the carpet adhesive or mastic does not contain asbestos, and that asbestos contamination is not present on the top side of the carpet.
- An alternate work practice is necessary if the resilient asbestos flooring is damaged or if it becomes damaged during removal of the carpet.
- a The installation of new carpet over old asbestos containing flooring is not permitted at West Virginia University (2003).
- A Competent Person must verify that the carpet can be removed without disturbing the resilient asbestos flooring in order for this work practice to be used.



- I) Obtain and review copies of work order and schedule work.
- 2) The following is a checklist of tools, equipment, and materials recommended to perform the steps outlined below.

Tools, Equipment, and Materials

Utility knife Disposal bags with labels

GFCI's HEPA vacuum with attachments

Extension cords and adapters Respirators

Lockout tags Disposable coveralls

Temporary work lights Disposable towels or wet wipes

Wet wipes or bucket with clean water

Safety glasses

Asbestos barrier tape
Warning signs

Polyethylene sheet

Garden sprayer

Authorized Authorized Salety glasses

Polyethylene sheet

Duct tape

Amended water

Heat Gun

Air monitoring equipm

Heat Gun Air monitoring equipment Flashlight

- 3) Move tools, equipment, and materials to work area.
- 4) Secure work area
 - Vacate work area to prevent building occupant exposure
 - 11 Restrict work area using barrier tape, signage, or partitions.

NOTE: Signage should read 'DANGER' or 'KEEP OUT OF CONSTRUCTION AREA"

In high occupancy areas, put up a secondary barrier to prevent unauthorized access to work area.

<u>For example</u>: Black plastic, plywood partitions, or locking all doors to work area.

- 5) Find a seam or comer where carpet removal can begin.
 - 11 Ifno seams or comers exist, make a cut around the piece to be removed.
 - t1 Cut carpet using utility knife with a new blade.

- 6) Pry up comer or seam of carpet using scraper.
 - Pull back a section large enough (approximately one square foot) to hang onto while removing carpet.
 - . a Vacuum exposed flooring and back of carpet.
- 7) Pull carpeting back slowly and vacuum exposed flooring and back of carpet.
- 8) Remove carpet in pieces no larger than 200 square feet.
 - If portions of asbestos-containing flooring remain attached to the carpeting, stop work and notify the supervisor; an alternate work practice will be necessary to accomplish the task.
- 9) Roll up carpet and dispose as normal waste.
- 10) Vacuum surface of flooring after carpet is removed.
- 11)Return tools, equipment, and remaining materials to storage area.
- 12) Notify supervisor that work is completed and complete documentation.

THERMAL SYSTEM INSULATION (TSI) WORK PRACTICES

Tt	Remove asbestos-containing insulation on exposed pipe for maintenance work (Glovebag Required)
T2	Repair damaged asbestos-containing insulation on a pipe, boiler, duct or flue (No Disturbance)
Т3	Install device in or access surface of asbestos-containing insulation on a pipe, boiler, duct or flue
T4	Clean up asbestos-containing debris in crawlspace or tunnel

Tt

Remove asbestos-containing insulation on exposed pipe or duct for maintenance work (Glovebag/Enclosure Required)**

Example

The following are examples of work that can be performed using the procedures of this work practice. If job conditions vary from the examples, stop work and notify your supervisor.

- a Removal of pipe insulation in good condition to make a new connection to an existing pipe.
- a Removal of insulation in good condition from a fitting to replace a valve.
- a Remove a section of ACM pipe insulation above non-ACM lay-in panel, plaster or drywall ceiling where insulation is in good condition, e.g., to repair pipe leak.
- a Attach branch line to existing ACM steam line above non-ACM plaster ceiling.
- a Remove a section of pipe insulation in poor condition for fitting replacement.
- a Remove a section of pipe insulation in poor condition, or with metal jacket, or waterproofed to replace a section of pipe.
- a Repair small pipe leak in boiler room.
- a Install new ceiling mounted hot water heating unit in warehouse space fed from existing piping.
- a Remove insulation on 12" fitting in poor condition, 15 feet above floor level to repair leak in steam line.
- a Remove insulation on pipe adjacent to steel grate catwalk 30 feet above floor in boiler room.
- a Remove a small area of damaged duct insulation so that new branch lines can be tied to existing duct system for sub-divided office space.
- a Remove a small area of delaminating duct insulation.

Buildings

The following buildings are examples where these work practices can be applied.

- a Hodges Hall
- a Steamtunnel

Guidelines

- **u** Two or more Asbestos workers are required to complete the scope of this work practice.
- u This work practice covers the procedures for removing small amounts of asbestos-containing insulation from an exposed pipe in an unoccupied area such as a boiler or mechanical room. The procedure assumes that the pipe insulation is accessible from a ladder or scaffold.

Notes

Negative pressure containments shall be constructed for this procedure, **unless, the erection or installation of a containment is likely to cause more disturbance to the ACM which may result in asbestos fiber release and unnecessary exposure to the worker. If an enclosure cannot be installed, contact the asbestos program manager for alternative work procedures .

Glovebags should be used only once and must not be moved to another location to perform additional removal work, or reused in any way. Use only 60"x 60" standard-sized glovebags. Do not use glovebags on surfaces or equipment over 150°F. If you encounter a situation that requires a special type or size of glovebag, or if hot surfaces are involved, notify supervisor.

Note that significant asbestos exposures to workers can result from the improper use of glovebags.

Do not use power tools inside glovebags.

This work practice is for individual small maintenance activities where the amount of debris involved can be contained in one 60" by 60" disposal bag. It is standard industry practice not to fill these bags more than one-third full, to allow for proper sealing and to guard against breakage. If more than this amount of debris is found, stop work, close ceiling, and notify your supervisor.

- 1) Obtain and review a copy of the work order and schedule for work.
- 2) The following is a checklist of tools, equipment, and materials recommended to perform the steps outlined below.

Tools, Equipment, and Materials

Utility knife Disposal bags with labels

GFCI's HEPA vacuum with attachments

Extension cords and adapters Respirators

Lockout tags Disposable coveralls

Temporary work lights Disposable towels or wet wipes

Ladder or scaffold for elevated work

Asbestos barrier tape

Wet wipes or bucket with clean water Warning signs
Smoke test bulb and tubes Garden sprayer

Smoke test bulb and tubes

Bone saw

Wire cutters

Garden sprayer

Amended water

Lockdown encapsulant

Tin snips
Air monitoring equipment
Safety glasses
Glovebags (if required)

Polyethylene sheet Nylon Brush

Duct tape

In the event of a fiber release, see Appendix D: Procedures for Fiber Release Episodes.

- 3) Obtain required respirators. The minimum level of respirator for this procedure is a half face air-purifying respirator.
- 4) Move tools, equipment, and materials to work area.
- 5) Secure work area
 - n Vacate work area to prevent building occupant exposure
 - a Restrict work area using barrier tape, signage, or partitions.

NOTE: Signage should read 'DANGER" or 'KEEP OUT OF CONSTRUCTION AREA"



In high occupancy areas, put up a secondary barrier to prevent unauthorized access to work area.

<u>For example</u>: Black plastic, plywood partitions, or locking all doors to work area.

6) Lockout electrical systems that may create a hazard during O&M activities.

NOTE: Lockout tags should note when and why power is shut down and the personnel performing the lockout. There should only be one key for each lock used on lockout tags to prevent accidental reactivation of equipment.

- 7) Pre-clean work area if visible dust or debris is present, using one or more of the following techniques.
 - iii Pick up dust/debris with HEPA vacuum
 - iii Wet wipe non-porous surfaces
 - t1 HEPA vacuum surfaces not able to be wiped
 - iii Clean carpeting using steam cleaner or HEPA vacuum
- 8) Set up glovebag as follows:
 - a) Place open end of glovebag around pipe.
 - b) Place necessary tools into pouch located inside glovebag.
 - c) Seal top edge and side cuts securely.
 - d) Use smoke tube and aspirator bulb to test seal.
 - e) Attach hose from an operating HEPA vacuum into glovebag.
- 9) Enter secured work area to put on protective clothing.

NOTE: DO NOT put on disposable Tyvex coveralls in public areas

- *iii* Workers are required to wear appropriate PPE as directed by the competent person on site.
- 10) Air monitoring begins at this point.
- 11) Put on respirator and perform fit checks.
- 12) Insert arms into glovebag sleeves.
- 13) Adequately wet ACM material with amended water.



14) Remove insulation using scraper or other tools.

NOTE: Place pieces in bottom of bag; DO NOT DROP.

- 15) Complete observations and/or necessary work above the drop ceiling.
- 16) Rinse all tools with amended water inside the bag.
 - Place back into pouch or sleeve of the glovebag turned inside out.
- 17) Wash inside of glovebag with amended water.
 - Move all debris to lower part of bag, below where bag will be twisted and cut.
- 18) Remove water wand.
 - t1 Twist water sleeve closed.
 - is Seal with duct tape.
- 19) From outside the bag:
 - Pull the tool pouch or sleeve away from the bag.
 - tt Twist pouch to seal it from rest of bag.
 - 11 Place duct tape over twisted portion.
 - t1 Cut through the twisted/taped section.
- 20) Evacuate air from glovebag using HEPA vacuum.
 - with HEPA vacuum operating, twist bag several times.

NOTE: Be sure all removed insulation has been placed in bottom of bag below where the bag will be twisted.

- 11 Place duct tape over twisted portion.
- 21) Remove glovebag from piping.
 - 111 Slip a disposal bag over the glovebag.
 - **n** Cut the top of the glovebag.
 - Lower glovebag into disposal bag.
- 22) Apply a pre-wetted lag cloth or lockdown encapsulant, where required and as directed by the Competent Person, using an airless garden sprayer, to surfaces where ACM was removed or disturbed.

Note: See Appendix C for detailed Lockdown/Encapsulation Procedures.

23) Package and label asbestos waste for disposal.



- a) Disposal bags should be collapsed by evacuating the air from the bag with the HEPA vacuum in the work area or enclosure.
- b) Once collapsed, twist the bag to form a neck and wrap it tight with duct tape.
- c) Fold neck of bag over to form a loop, then again wrap duct tape around neck and loop.

Note: See Appendix B for specific labeling requirements.

- 24) Conduct visual inspection.
 - the person performing the inspection must be a Competent Person.
- 25) Remove drop cloth and/or mini-enclosure and dispose as contaminated asbestos waste.
- 26) Clean tools, equipment, and work area using wet wiping and HEPA vacuuming as appropriate and return tools and equipment to outside work area.
- 27) HEPA vacuum coveralls
 - a) If two disposable coveralls are used:
 - While wearing respirator, remove outer coveralls in work area
 - 11 Place coveralls in disposal bag
 - 11 Remove remaining coveralls and place in disposal bag
 - b) Ifone set of coveralls are used:
 - While wearing respirator, HEPA vacuum coveralls while in work area
 - n Remove coveralls, place in disposal bag
 - c) If street clothes are contaminated
 - t1 HEPA vacuum
 - n Remove and place in disposal bag
 - a Clothes must be disposed of or cleaned as ACM
- 28) Complete personal air monitoring work.
 - 11 Stop pump
 - a Remove cassette. Be sure to cap all openings
 - to Complete chain of custody and send to EH&S
- 29) Wash hands, face and respirator
 - a Use disposable towels and clean water
 - a Wash hands, face and surface of respirator.

NOTE: **DO** NOT BREAK SEAL BETWEEN FACE AND RESPIRATOR

- 11 Place towels into disposal bag and seal.
- 30) At this point all waste will be double bagged before leaving secured work area.
- 31) Once all waste is double bagged remove respirator; cleaning and storing according to Respiratory Protection program
- 32) Return decontaminated tools, equipment and remaining materials to storage area.
- 33) Remove lockout tags and restart HVAC/electrical system(s).
- 34) Restore normal accessibility to work area.
- 35) Transport waste to designated asbestos waste storage area.
 - Waste should be lifted and carried, or transported in wheeled carts, when moved from one area to another.
 - t1 DONOT DRAG PACKAGED WASTE
 - Packaged waste should be <u>PLACED</u>, NOT THROWN OR DROPPED, into vehicles and storage areas
 - to Lock all waste in West Virginia University's asbestos storage facility

Repair damaged asbestos-containing insulation on a pipe, boiler, duct, or flue (No Disturbance)

Example

The following are examples of work that can be performed using the procedures of this work practice. If job conditions vary from the examples, stop work and notify your supervisor.

- Repair small area of impact damage on pipe insulation in good condition where lagging is intact.
- o Repair a small area of badly damaged flue or duct insulation.
- tt Repair a small area of water damaged insulation on hot water tank or boiler.
- a Repair a small area of badly damaged ACM pipe insulation.

Buildings

The following buildings are examples where these work practices can be applied.

- t1 Mountainlair
- o Percival Hall

Guidelines

- o Generally, only one trained asbestos worker is necessary to complete the scope of this work practice.
- If the insulation is damaged beyond repair, refer to Tl work practices for appropriate removal procedures.

Notes for Boiler, Duct, or Flue

The insulation system on boilers ducts and flues can be complicated. It frequently consists of several layers. The inner layer is typically blocks of asbestos wired or fastened in place. This may be covered with an insulating asbestos cement reinforced with chicken wire. The insulation cement may be troweled smooth as a lagging or a

separate lagging may be installed. This lagging may be a dense hard cement, a cloth impregnated with cement, or some other installation method. This lagging may or may not contain asbestos. The final lagging is usually continuous so that there are no visible joints, except for expansion joints.

Repair of insulation and lagging on boilers, ducts and flues requires skill and understanding of insulating techniques. It is preferable to train skilled insulators in Asbestos O&M procedures rather than to expect asbestos workers to perform insulating and lagging work. The quick fix of a plug of insulating material with a patch of wettable lagging cloth over a hole in boiler or flue insulation is highly likely to fail. Many lagging repairs made by asbestos O&M trained workers have failed after a short period oftime when the repair cracked loose or fell out due to expansion and contraction of the insulation. In many instances the surface temperature of the insulation is sufficiently high to restrict use of any cloth materials.

Notes for Pipe Insulation

The insulation system on piping usually consists of insulation that is soft and easily damaged, covered by a lagging that protects the insulation. Laggings on piping are typically made from paper, cloth, cement or cloth impregnated with cement. The lagging may or may not contain asbestos. It may be continuous so that there are no visible joints, or all joints between sections of insulation may be exposed. Some insulation systems have an integral lagging made from the same material as the insulation (e.g., some aircell insulation systems) that may be fragile and require great care.

Repair work on TSI that has a small dent or hole by wrapping with a wetted lagging cloth contacts, but does not disturb the ACM. If this is the case, then this work practice may be used. If any disturbance of ACM insulation is anticipated (e.g., removal, adjustment, cutting, tearing, repositioning), an alternative work practice with more protective engineering controls should be used.

Installation of pipe lagging is a plumbing skill not an abatement skill. Installation or repair of pipe insulation materials requires special skills, especially cold surfaces. Particular care is needed to restore vapor barriers and protect against condensation and moisture/frost migration. Workers installing lagging material as an asbestos control activity should be trained by an experienced plumber or insulator in proper lagging installation. Many lagging repairs made by trained asbestos abatement workers have failed after a short period of time due to damage caused by expansion and contraction of the pipe insulation. The design of the O&M program should include the selection of the correct lagging material for the service conditions of the pipe insulation.

- 1) Obtain and review copies of work order and schedule work.
- 2) The following is a checklist of tools, equipment, and materials recommended to perform the steps outlined below.

Tools, Equipment, and Materials

GFCI's
Extension cords and adapters
Lockout tags
Temporary work lights
Ladder or scaffold for elevated work
Flashlight
Safety glasses

In the event of a fiber release, see **Appendix D: Procedures for Fiber Release Episodes.**

- 3) Move tools, equipment, and materials to work area.
- 4) Secure work area
 - a Vacate work area to prevent building occupant exposure
 - Restrict work area using barrier tape, signage, or partitions.

NOTE: Signage should read "DANGER" or "KEEP OUT OF CONSTRUCTION AREA"

In high occupancy areas, put up a secondary barrier to prevent unauthorized access to work area.

For example: Black plastic, plywood partitions, or locking all doors to work area.

- 5) Place ladder or scaffold in work area.
- 6) Adequately wet material at area to be repaired.
- 7) Cut out damaged TSI, trimming edges so straight square clean edges remain. This procedure must only be performed on adequately wet material and with a



HEPA vacuum nozzle adjacent to the cutting tool so that any debris or fibers are captured by the HEPA vacuum .

- 8) Place ACM debris into disposal bags.
- 9) Properly re-insulate and re-lag repaired area. Apply all lagging materials wet and insure the existing ACM material is not disturbed by lagging insulation.
- I0) Complete observations and necessary work.
- 11) Return tools, equipment, and remaining materials to storage area.
- 12) Notify supervisor that work is completed and complete documentation.

Install device in or access surface of asbestos-containing insulation on a pipe, boiler, duct or flue**

Example

The following are examples of work that can be performed using the procedures of this work practice. If job conditions vary from the examples, stop work and notify your supervisor.

- Drill through insulation using power tools to attach heat sensor directly on metal flue.
- a Remove a small area of damaged insulation in order to attach heat sensor directly on metal flue.

Buildings

The following buildings are examples where these work practices can be applied.

- tt Mountainlair
- 11 Percival Hall

Guidelines

- a Two or more asbestos trained workers are necessary to complete the scope of this work practice.
 - **The competent person will determine if the room is to be prepped or an enclosure is to be used.
- This work practice covers the procedures for the removal of small amounts of ACM as required to install a device (such as a temperature sensor or damper control) in, or simply to access, the surface of an ACM-installed pipe, boiler, duct or flue.
- This work practice relies on the use wetting and layer-by-layer removal of a small patch of insulation to keep airborne fiber levels below the OSHA PEL and avoid spreading dust and debris. Some experimentation may be necessary to determine

optimal methods for equipment in a given facility. Different types of equipment may have different insulation systems. Some types of equipment may have insulation containing high concentrations of amosite. Procedures that rely on wetting would be less effective in this situation than where only chrysotile is involved. A work practice developed on a chrysotile system which wets adequately may not be effective for an amosite system. Work practices that use local area exhaust with a HEPA vacuum as the primary means of control have a better chance of being universally applicable.

a Prefabricated removal enclosures include "glovebox" type enclosures, glovebags with self-supporting frames, and glovebags that funnel waste into standard disposal bags.

Work Procedures

- 1) Obtain and review copies of work order and schedule work.
- 2) The following is a checklist of tools, equipment, and materials recommended to perform the steps outlined below.

Tools, Equipment, and Materials

GFCI's
Extension cords and adapters
Lockout tags
Temporary work lights
Ladder or scaffold for elevated work
Flashlight
Safety glasses

In the event of a fiber release, see Appendix D: Procedures for Fiber Release Episodes.

- 3) Move tools, equipment, and materials to work area.
- 4) Secure work area
 - 11 Vacate work area to prevent building occupant exposure
 - a Restrict work area using barrier tape, signage, or partitions.

NOTE: Signage should read 'DANGER' or 'KEEP OUT OF CONSTRUCTION AREA"

a In high occupancy areas, put up a secondary barrier to prevent unauthorized access to work area.

For example: Black plastic, plywood partitions, or locking all doors to work area.

- 5) Place ladder or scaffold in work area.
- 6) Adequately wet material at area to be repaired.
- 7) Cut out TSI, trimming edges so straight square clean edges remain. This procedure must only be performed on adequately wet material and with a HEPA



- vacuum nozzle adjacent to the cutting tool so that any debris or fibers are captured by the HEPA vacuum.
- 8) Place ACM debris into disposal bags.
- 9) Complete observations and necessary work.
- 10)Properly re-insulate and re-lag repaired area. Apply all lagging materials wet and insure the existing ACM material is not disturbed by lagging insulation.
- 11) Return tools, equipment, and remaining materials to storage area.
- 12) Notify supervisor that work is completed and complete documentation.

Clean up asbestos-containing debris in crawlspace or tunnel

Example

The following are examples of work that can be performed using the procedures of this work practice. If job conditions vary from the examples, stop work and notify your supervisor.

- a Clean up a small amount of deteriorated ACM pipe insulation debris that will disintegrate when picked up in a tunnel.
- Clean-up a small amount of deteriorated ACM duct insulation debris that is mixed into soil in a crawl space.

Buildings

The following buildings are examples where these work practices can be applied.

- tt Steam Tunnel
- tl Boreman South

Guidelines

- ri Generally, only one asbestos trained worker is required to complete the scope of this work practice unless the area is classified as a confined space. If a confined space, two or more asbestos trained workers are required to complete the scope of this work practice.
- ^{t1} Crawl spaces may be classified as confined spaces. You must have appropriate training before entering a confined space. Notify your supervisor if you are required to enter a confined space.
- This work practice describes the work required to clean up small amounts of asbestos-containing debris found in a crawlspace area or tunnel.

Notes

This work practice presumes the existence of a floor. Many crawl spaces have dirt floors. There could also be localized flooding, low head height and other factors that will affect the work practices. Revise as necessary as required by conditions in the specific facility. Refer to other work practices in this manual for examples that can be applied to this situation. Some experimentation may be necessary to determine best methods in a given situation.

Workers are required to wear appropriate PPE as directed by the competent person on site.

Varying conditions may require the competent person to modify the procedures in this work practice.

Do not use this procedure if more debris will be disturbed than will fit comfortably into one 60" x 60" disposal bag. Ifmore than this amount of debris is found, stop work, close ceiling and notify your supervisor.

Work Procedures

- 1) Obtain and review copies of work order and schedule work.
- 2) The following is a checklist of tools, equipment, and materials recommended to perform the steps outlined below.

Tools, Equipment, and Materials

GFCI's
Extension cords and adapters
Lockout tags
Temporary work lights
Ladder or scaffold for elevated work
Lockdown encapsulant
Flashlight
Safety glasses

In the event of a fiber release, see **Appendix D: Procedures for Fiber Release Episodes.**

- 3) Move tools, equipment, and materials to work area.
- 4) Secure work area
 - Vacate work area to prevent building occupant exposure
 - n Restrict work area using barrier tape, signage or partitions.

NOTE: Signage should read 'DANGER' or 'KEEP OUT OF CONSTRUCTION AREA"

n In high occupancy areas, put up a secondary barrier to prevent unauthorized access to work area.

For example: Black plastic, plywood partitions, or locking all doors to work area.

- 5) Adequately wet material at area to be repaired.
- 6) Starting near entry to area and working toward rear of area, pick up pieces of debris and place into disposal bags.



- 7) Adequately wet areas where debris was removed.
 - Use HEPA vacuum to remove any remaining debris.
 - a Place debris into disposal bags.
 - a HEPA vacuum floor after gross debris is removed.
- 8) Apply a lockdown encapsulant, where required and as directed by the Competent Person, using an airless garden sprayer, to surfaces where ACM was removed or disturbed.

Note: See Appendix C for detailed Lockdown/Encapsulation Procedures.

- 9) Package and label asbestos waste for disposal.
 - a) Disposal bags should be collapsed by evacuating the air from the bag with the HEPA vacuum in the work area or enclosure.
 - b) Once collapsed, twist the bag to form a neck and wrap it tight with duct tape.
 - c) Fold neck of bag over to form a loop, then again wrap duct tape around neck and loop.

Note: See Appendix B for specific labeling requirements.

- 10) Complete observations and necessary work.
- 11) Return tools, equipment, and remaining materials to storage area.
- 12) Notify supervisor that work is completed and complete documentation.
- 13)Transport waste to designated asbestos waste storage area.
 - **a** Waste should be lifted and carried, or transported in wheeled carts, when moved from one area to another.
 - to DO NOT DRAG PACKAGED WASTE
 - n Packaged waste should be PLACED, NOT THROWN OR DROPPED, into vehicles and storage areas
 - to Lock all waste in West Virginia University's asbestos storage facility

SURFACING MATERIAL WORK PRACTICES

S1	Moving a non-asbestos-containing ceiling panel below a space that has exposed surfacing ACM in good condition (No Disturbance)
S2	Moving a non-asbestos-containing ceiling panel below a space that has exposed and damaged surfacing ACM (Enclosure Recommended)
S3	Attach component to an ACM finished surface above a drop ceiling (Enclosure Recommended)
84	Remove a small amount of spray-applied ACM surfacing above a drop ceiling (Enclosure Recommended)
S5	Work in ceiling plenum space where exposed surfacing ACM is present in good condition (No Disturbance)
86	Work in ceiling plenum space where exposed surfacing ACM in damaged condition is present (Enclosure Recommended)
S7	Install wiring in plenum space where exposed surfacing ACM is present in 200d condition (No Disturbance)
SS	Install wiring in plenum space where exposed ACM fireproofing or damaged ACM is present (Enclosure Recommended)
S9	Attach item to ceiling finished with ACM surfacing material in good condition (Enclosure Recommended)
S10	Repair or replace item in surface finished with ACM (No Disturbance)
S11	Repair or replace item in surface finished with ACM (Enclosure Recommended)
812	Cut or drill hole in surfacing ACM (Enclosure Recommended)
S13	Replace bulbs in light fixture attached to or in surface finished with ACM (No Disturbance)
S14	Clean room with exposed ACM surfacing material in good condition (No Disturbance)
S15	Repair damaged surfacing ACM (No Disturbance)

816	Repair damaged surfacing ACM (Enclosure
	Recommended)
817	Accessing through an ACM finished surface (No
	Disturbance)
818	Accessing through an ACM finished surface (Enclosure
	Recommended)
819	Painting surfacing ACM (No Disturbance)

Appendix C

Lockdown/Encapsulation Procedures

Lockdown encapsulants used during asbestos removal operations should be tested per 1978 Battelle/EPA report "Tests for the Evaluation of Encapsulants for Friable Asbestos-Containing Materials". Encapsulants should be water resistant after curing and be Class "A"fire-rated per ASTM 84-81A "Standard Method for Surface Burning Characteristics of Building Materials".

Encapsulants must be compatible with any materials that will be installed over the encapsulant. Note that many lockdown encapsulants will act as an adhesive and could be objectionable on some surfaces when dry. Care should be taken to avoid getting encapsulant on or in HVAC units, HEPA vacuums, and negative pressure machines.

The lockdown encapsulant is typically applied for O&M work using an airless garden sprayer. It should be applied in accordance with the manufacturer's recommendations in two light coats sprayed from opposite directions to seal all portions of surfaces including any exposed edges of remaining ACM.

DO NOT APPLY LOCKDOWN ENCAPSULANT ON FIREPROOFING OR TO STEEL THAT IS GOING TO BE FIREPROOFED, WITHOUT PRIOR APPROVAL FROM THE SUPERVISOR. The use of spray fireproofing is based on full-scale fire endurance tests of fireproofed steel. Anything that differs from the tested assembly voids the test, and could result in a fireproofing failure. Fireproofing is a non-combustible insulator of steel. Coating it or saturating it with an encapsulant could render it combustible and could reduce its insulating properties. This could cause the fireproofing to fail and as such, voids the fire rating. The introduction of an encapsulant between the fireproofing and the steel could cause the bond of the fireproofing to the steel to weaken causing the fireproofing to fall off, or the encapsulant could be softened and allow the fireproofing to fall off during a fire. Unless the encapsulant has been tested and approved for use by the manufacturer of the fireproofing used, its use will void the fire rating of the fireproofing material.

Moving a non-asbestos-containing ceiling panel below a space that has exposed surfacing ACM in good condition (No Disturbance)

Example

The following are examples of work that can be performed using the procedures of this work practice. If job conditions vary from the examples, stop work and notify your supervisor.

a Move a non-ACM ceiling panel to make observations above a drop ceiling and below exposed asbestos-containing plaster or fireproofing in good condition.

Building

The following building is an example where these work practices can be applied.

a Law Center

Guidelines

- a Generally, only one trained asbestos worker is necessary to complete the scope of this work practice.
- a The procedure assumes that the ACM will not intentionally be disturbed during the work.
- a If there is any visible ACM debris on top of the ceiling tiles or if fallout of debris or dust cannot adequately be controlled, then an enclosure is required to protect the building environment.
- An employee with asbestos training may raise a drop ceiling panel to determine whether it can be safely removed based on the condition of surfacing and Thermal Surface Insulation (TSI) observed above. However, if any amount of debris is found, stop work, close ceiling, and notify supervisor.

Notes

This work practice should only be used in situations where: the ACM surfacing material is in good condition, there is no ACM dust and/or debris on top of ceiling tiles, and ACM above the ceiling will not be disturbed when the tile is lifted.

This work practice is **not** appropriate for other activities such as replacing ceiling panels in a room. The work practices are based on "T-bar" ceiling with lift out panels, but can be easily modified for Z-spline and other sorts of ceiling that provide plenum access.

ACM drop ceiling tiles (up to three) may be temporarily displaced to access areas over the ceiling if the ceiling tiles are in good condition, and no debris is observed above the ceiling, and the ceiling tiles may be removed without damaging the edges of the tiles.

Work Procedures

- 1) Obtain and review copies of work order and schedule work.
- 2) The following is a checklist of tools, equipment, and materials recommended to perform the steps outlined below.

Tools, Equipment, and Materials

GFCI's
Extension cords and adapters
Lockout tags
Temporary work lights
Ladder or scaffold for elevated work
Flashlight
Safety glasses

In the event of a fiber release, see **Appendix D: Procedures for Fiber Release Episodes.**

- 3) Move tools, equipment, and materials to work area.
- 4) Secure work area
 - a Vacate work area to prevent building occupant exposure
 - a Restrict work area using barrier tape, signage or partitions.

NOTE: Signage should read 'DANGER' or 'KEEP OUT OF CONSTRUCTION AREA"

a In high occupancy areas, put up a secondary barrier to prevent unauthorized access to work area.

For example: Black plastic, plywood partitions, or locking all doors to work area.

- 5) Place ladder or scaffold in work area.
- 6) Carefully raise ceiling tile and inspect area for visible dust or debris.
 - **a** Ifdust or debris is present, stop work, replace ceiling tile, and notify supervisor.



- a Ifno debris is present, carefully lift up the ceiling panel.
- If lifting is obstructed by wires, ducts, conduit, etc., move to another panel.
- a Keep panel as flat as possible while lifting panel.
- a Lift panel slightly above grid system and slowly slide panel to one side, leaving panel on top of an adjacent panel.
- 7) Complete observations and necessary work.
- 8) Return tools, equipment, and remaining materials to storage area.
- 9) Notify supervisor that work is completed and complete documentation.

Moving a non-asbestos-containing ceiling panel below a space that has exposed and damaged surfacing ACM (Enclosure Recommended)**

Example

The following are examples of work that can be performed using the procedures of this work practice. If job conditions vary from the examples, stop work and notify your supervisor.

n Move non-ACM ceiling tiles to access valve where surfacing or other ACM in poor condition (and/or ACM dust or debris) is present above the ceiling.

Building

The following building is an example where these work practices can be applied.

n Law Center

Guidelines

- **ti** Two or more Asbestos workers are required to complete the scope of this work practice.
- **ti** If there is any visible ACM debris on top of the ceiling tiles or if fallout of debris or dust cannot adequately be controlled, then an enclosure is required to protect the building environment.
- ti Airborne asbestos is released at the ceiling line when debris is disturbed by lifting a tile. The use of a HEPA vacuum at the point of disturbance will collect these airborne fibers. The negative pressure inside a properly installed enclosure helps draw airborne fibers away from the plenum. Asbestos is also released into the air at the floor line when debris lands on the floor. Prompt clean up will prevent additional release from the ACM being walked on. The enclosure helps contain these fibers, and the HEPA vacuum used to form a negative pressure will help collect them.

Notes

**Negative pressure containments shall be constructed for this procedure, <u>unless</u>, the erection or installation of a containment is likely to cause more disturbance to the ACM which may result in asbestos fiber release and unnecessary exposure to the worker. If an enclosure cannot be installed, contact the asbestos program manager for alternative work procedures.

This work practice is for individual small maintenance activities where the amount of debris involved can be contained in one 60" by 60" disposal bag. It is standard industry practice not to fill these bags more than one-third full, to allow for proper sealing and to guard against breakage. If more than this amount of debris is found, stop work, close ceiling, and notify your supervisor.

This work practice is **not** appropriate for other activities such as replacing ceiling panels in a room. The work practices are based on "T-bar" ceiling with lift out panels, but can be easily modified for Z-spline and other sorts of ceiling that provide plenum access.

Work Procedures

- 1) Obtain and review a copy of the work order and schedule for work.
- 2) The following is a checklist of tools, equipment, and materials recommended to perform the steps outlined below.

Tools, Equipment, and Materials

Utility knife Disposal bags with labels

GFCI's HEPA vacuum with attachments

Extension cords and adapters Respirators

Lockout tags Disposable coveralls

Temporary work lights Disposable towels or wet wipes

Ladder or scaffold for elevated work

Asbestos barrier tape

Wet wipes or bucket with clean water Warning signs
Smoke test bulb and tubes Garden sprayer

Smoke test bulb and tubes Garden sprayer
Bone saw Amended water

Wire cutters Lockdown encapsulant
Tin snips Air monitoring equipment

Safety glasses Glovebags (if required)

Polyethylene sheet Nylon Brush Duct tape

In the event of a fiber release, see **Appendix D: Procedures for Fiber Release Episodes.**

- 3) Obtain required respirators. The minimum level of respirator for this procedure is a half face air-purifying respirator.
- 4) Move tools, equipment, and materials to work area.
- 5) Secure work area
 - a Vacate work area to prevent building occupant exposure
 - u Restrict work area using barrier tape, signage, or partitions.

NOTE: Signage should read 'DANGER" or 'KEEP OUT OF CONSTRUCTION AREA"



a In high occupancy areas, put up a secondary barrier to prevent unauthorized access to work area.

<u>For example</u>: Black plastic, plywood partitions, or locking all doors to work area.

6) Lockout electrical systems that may create a hazard during O&M activities.

NOTE: Lockout tags should note when and why power is shut down and the personnel performing the lockout. There should only be one key for each lock used on lockout tags to prevent accidental reactivation of equipment.

- 7) Pre-clean work area if visible dust or debris is present, using one or more of the following techniques.
 - a Pick up dust/debris with HEPA vacuum
 - n Wet wipe non-porous surfaces
 - a HEPA vacuum surfaces not able to be wiped
 - tt Clean carpeting using steam cleaner or HEPA vacuum
- 8) The competent person will determine if the room is to be prepped or a mini enclosure is to be used. Follow (a) and (b) below for prepping the room, or (c) for using a mini enclosure.
 - a) Install critical barriers within work area
 - a Close all openings with sheet plastic at least 6 mil thick
 - 11 Duct tape all cracks
 - 11 Seal the following with duct tape and polyethylene sheets
 - **a** Air intakes and returns
 - a Light fixtures (being careful not to burn or melt plastic)
 - 11 Clocks
 - 11 Doorways
 - 1:1 Windows
 - a Convectors and speakers
 - *ii* All other openings
 - 11 Maintain all seals until the decontamination step is completed.
 - b) Place a polyethylene drop cloth
 - Spread single layer on floor -be sure it covers an area large enough catch falling debris
 - a Stabilize sheet by using tape or weights
 - **a** Use caution not to tear plastic if working on soft flooring (carpet)



CAUTION: Drop cloth introduces a potential slip hazard; non-slip foot coverings are recommended

- c) Set up mini enclosure(s) when engineering and work practices are unable to control asbestos fiber release.
 - Two workers are necessary to set up and perform work in minienclosures
 - 12 After enclosure is in place, check for, and clean up any debris generated by enclosure installation
 - use a HEPA vacuum to obtain negative pressure
- 9) Place tools, equipment and materials needed into the enclosure. Include HEPA vacuum inside the enclosure for vacuuming areas above the ceiling.
- 10)Enter secured work area to put on protective clothing.

NOTE: DO NOT put on disposable Tyvex coveralls in public areas

- **n** Workers are required to wear appropriate PPE as directed by the competent person on site.
- 11) Air monitoring begins at this point.
- 12) Put on respirator and perform fit checks.
- 13) Carefully lift up ceiling panel while HEPA vacuuming around edges of the panel.
 - a) Remove any ACM debris and dust from the top of the ceiling panel or adjacent panels with the HEPA vacuum.
 - b) Keep panel as flat as possible while lifting panel.
 - c) Lift panel slightly above grid system and slowly slide panel to one side, leaving panel on top of adjacent panel.
 - d) Maintain nozzle of HEPA vacuum in operation above plane of the ceiling at all times that the ceiling is open.
- 14)Lightly mist plenum space on top side of ceiling where work will occur using garden sprayer with amended water.
- 15) Pick up any bulk debris on top of ceiling panels where work will occur and place into disposal bags.



- 16) HEPA vacuum ceiling suspension system and top side of ceiling where work will occur.
- 17) Complete observations and/or necessary work above the drop ceiling.
- 18)Apply a lockdown encapsulant, where required and as directed by the Competent Person, using an airless garden sprayer, to surfaces where ACM was removed or disturbed.

Note: See Appendix C for detailed Lockdown/Encapsulation Procedures.

- 19)Do not spray encapsulant on fireproofing or steel which fireproofing is to be applied without specific authorization from your supervisor. An inappropriate encapsulant could cause the fireproofing to fail and result in a life threatening situation.
- 20) Wet wipe or HEPA vacuum the underside of the panel which was moved.
- 21) Carefully replace ceiling panel.
- 22) Package and label asbestos waste for disposal.
 - a) Disposal bags should be collapsed by evacuating the air from the bag with the HEPA vacuum in the work area or enclosure.
 - b) Once collapsed, twist the bag to form a neck and wrap it tight with duct tape.
 - c) Fold neck of bag over to form a loop, then again wrap duct tape around neck and loop.
 - d) Place bag in decon.

Note: See Appendix B for specific labeling requirements.

- 23) Conduct visual inspection.
 - The person performing the inspection must be a Competent Person.
- 24) Remove drop cloth and/or mini-enclosure and dispose as contaminated asbestos waste.
- 25) Clean tools, equipment, and work area using wet wiping and HEPA vacuuming as appropriate and return tools and equipment to outside work area.
- 26) HEPA vacuum coveralls



- a) If two disposable coveralls are used:
 - **u** While wearing respirator, remove outer coveralls in work area
 - Place coveralls in disposal bag
 - Enter decon with disposal bag
 - n Remove remaining coveralls and place in disposal bag
- b) If one set of coveralls are used:
 - While wearing respirator, HEPA vacuum coveralls while in work area
 - 11 Enter decon and remove coveralls, place in disposal bag
- c) If street clothes are contaminated
 - 11 HEPA vacuum while in decon
 - 11 Remove and place in disposal bag
 - 11 Clothes must be disposed of or cleaned as ACM
- 27) Complete personal air monitoring work.
 - t1 Stoppump
 - Remove cassette. Be sure to cap all openings
 - 11 Complete chain of custody and send to EH&S
- 28) Wash hands, face and respirator while standing in decon
 - u Use disposable towels and clean water
 - wash hands, face and surface of respirator.

NOTE: DO NOT BREAK SEAL BETWEEN FACE AND RESPIRATOR

- Place towels into disposal bag and seal.
- 29) At this point all waste will be double bagged before leaving decon.
- 30) Once all waste is double bagged remove respirator; cleaning and storing according to Respiratory Protection program
- 31) Return decontaminated tools, equipment, and remaining materials to storage area.
- 32) Remove lockout tags and restart HVAC/electrical system(s).
- 33) Restore normal accessibility to work area.
- 34) Transport waste to designated asbestos waste storage area.



- a Waste should be lifted and carried, or transported in wheeled carts, when moved from one area to another.
- DO NOT DRAG PACKAGED WASTE
- a Packaged waste should be PLACED, NOT THROWN OR DROPPED, into vehicles and storage areas
- Lock all waste in West Virginia University's asbestos storage facility

Attach component to an ACM :finished surface above a drop ceiling (Enclosure Recommended)**

Example

The following are examples of work that can be performed using the procedures of this work practice. If job conditions vary from the examples, stop work and notify your supervisor.

a Clamp a bracket onto the flange of a beam that is covered with spray applied asbestos-containing fireproofing.

Buildings

The following buildings are examples where these work practices can be applied.

- a Creative Arts Center
- a Law Center

Guidelines

- Two or more Asbestos workers are required to complete the scope of this work practice.
- a lfthere is any visible ACM debris on top of the ceiling tiles or if fallout of debris or dust cannot adequately be controlled, then an enclosure is required to protect the building environment.
- a Airborne asbestos is released at the ceiling line when debris is disturbed by lifting a tile. The use of a HEPA vacuum at the point of disturbance will collect these airborne fibers. The negative pressure inside a properly installed enclosure helps draw airborne fibers away from the plenum. Asbestos is also released into the air at the floor line when debris lands on the floor. Prompt clean up will prevent additional release from the ACM being walked on. The enclosure helps contain these fibers, and the HEPA vacuum used to form a negative pressure will help collect them.

Notes

Negative pressure containments shall be constructed for this procedure, **unless, the erection or installation of a containment is likely to cause more disturbance to the ACM which may result in asbestos fiber release and unnecessary exposure to the worker. If an enclosure cannot be installed, contact the asbestos program manager for alternative work procedures.

This work practice is for individual small maintenance activities where the amount of debris involved can be contained in one 60"by 60"disposal bag. It is standard industry practice not to fill these bags more than one-third full, to allow for proper sealing and to guard against breakage. If more than this amount of debris is found, stop work, close ceiling, and notify your supervisor.

This work practice is **not** appropriate for other activities such as replacing ceiling panels in a room. The work practices are based on "T-bar" ceiling with lift out panels, but can be easily modified for Z-spline and other sorts of ceiling that provide plenum access.

Work Procedures

- 1) Obtain and review a copy of the work order and schedule for work.
- 2) The following is a checklist of tools, equipment, and materials recorrunended to perform the steps outlined below.

Tools, Equipment, and Materials

Utility knife Disposal bags with labels

GFCI's HEPA vacuum with attachments

Extension cords and adapters Respirators

Lockout tags Disposable coveralls

Temporary work lights Disposable towels or wet wipes

Ladder or scaffold for elevated work

Asbestos barrier tape

Wet wipes or bucket with clean water

Warning signs

Condon approved.

Smoke test bulb and tubes Garden sprayer
Bone saw Amended water

Wire cutters

Lockdown encapsulant

Tin snips

Air monitoring equipment

Safety glasses

Glovebags (if required)

Polyethylene sheet

Nylon Brush

Duct tape

In the event of a fiber release, see **Appendix D: Procedures for Fiber Release Episodes.**

- 3) Obtain required respirators. The minimum level of respirator for this procedure is a half face air-purifying respirator.
- 4) Move tools, equipment, and materials to work area.
- 5) Secure work area
 - a Vacate work area to prevent building occupant exposure
 - *ii* Restrict work area using barrier tape, signage, or partitions.

NOTE: Signage should read 'DANGER' or 'KEEP OUT OF CONSTRUCTION AREA"

In high occupancy areas, put up a secondary barrier to prevent unauthorized access to work area.

<u>For example</u>: Black plastic, plywood partitions, or locking all doors to work area.

6) Lockout electrical systems that may create a hazard during O&M activities.

NOTE: Lockout tags should note when and why power is shut down and the personnel performing the lockout. There should only be one key for each lock used on lockout tags to prevent accidental reactivation of equipment.

- 7) Pre-clean work area if visible dust or debris is present, using one or more of the following techniques.
 - II Pick up dust/debris with HEPA vacuum
 - **II** Wet wipe non-porous surfaces
 - t1 HEPA vacuum surfaces not able to be wiped
 - a Clean carpeting using steam cleaner or HEPA vacuum
- 8) The competent person will determine if the room is to be prepped or a mini enclosure is to be used. Follow (a) and (b) below for prepping the room, or (c) for using a mini enclosure.
 - a) Install critical barriers within work area
 - a Close all openings with sheet plastic at least 6 mil thick
 - a Duct tape all cracks
 - tt Seal the following with duct tape and polyethylene sheets
 - 41 Air intakes and returns
 - a Light fixtures (being careful not to burn or melt plastic)
 - 1:1 Clocks
 - a Doorways
 - t1 Windows
 - a Convectors and speakers
 - tt All other openings
 - ti Maintain all seals until the decontamination step is completed.
 - b) Place a polyethylene drop cloth
 - a Spread single layer on floor -be sure it covers an area large enough catch falling debris
 - a Stabilize sheet by using tape or weights
 - tt Use caution not to tear plastic if working on soft flooring (carpet)

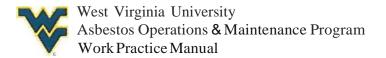


CAUTION: Drop cloth introduces a potential slip hazard; non-slip foot coverings are recommended

- c) Set up mini enclosure(s) when engineering and work practices are unable to control asbestos fiber release.
 - Two workers are necessary to set up and perform work in minienclosures
 - a After enclosure is in place, check for, and clean up any debris generated by enclosure installation
 - ^{t1} Use a HEPA vacuum to obtain negative pressure
- 9) Place tools, equipment and materials needed into the enclosure. Include HEPA vacuum inside the enclosure for vacuuming areas above the ceiling.
- 10) Enter secured work area to put on protective clothing.

NOTE: DO NOT put on disposable Tyvex coveralls in public areas

- Workers are required to wear appropriate PPE as directed by the competent person on site.
- 11) Air monitoring begins at this point.
- 12) Put on respirator and perform fit checks.
- 13) Obtain access through ceiling (as necessary) using the appropriate work practice.
- 14) Lightly mist the top side of ceiling where work will occur using garden sprayer with amended water.
- 15)Hold bracket against surface of fireproofing and secure by tightening clamp through fireproofing. Use care not to dislodge any fireproofing.
- 16) HEPA vacuum ceiling suspension system and top side of ceiling where work will occur.
- 17) Repair any damage to the fireproofing with new fireproofing patching material that is approved by its manufacturer for hand application. Install in accordance with manufacturer's instructions.
- 18) Carefully install item on bracket without disturbing fireproofing material.



- 19) Perform maintenance work; repair area with new non-ACM surfacing.
- 20) Apply a lockdown encapsulant, where required and as directed by the Competent Person, using an airless garden sprayer, to surfaces where ACM was removed or disturbed.

Note: See Appendix C for detailed Lockdown/Encapsulation Procedures.

- 21) Do not spray encapsulant on fireproofing or steel which fireproofing is to be applied without specific authorization from your supervisor. An inappropriate encapsulant could cause the fireproofing to fail and result in a life threatening situation.
- 22) Wet wipe or HEPA vacuum the underside of the panel which was moved.
- 23) Carefully replace ceiling panel.
- 24) Package and label asbestos waste for disposal.
 - a) Disposal bags should be collapsed by evacuating the air from the bag with the HEPA vacuum in the work area or enclosure.
 - b) Once collapsed, twist the bag to form a neck and wrap it tight with duct tape.
 - c) Fold neck of bag over to form a loop, then again wrap duct tape around neck and loop.
 - d) Place bag in decon.

Note: See Appendix B for specific labeling requirements.

- 25) Conduct visual inspection.
 - n The person performing the inspection must be a Competent Person.
- 26) Remove drop cloth and/or mini-enclosure and dispose as contaminated asbestos waste.
- 27) Clean tools, equipment, and work area using wet wiping and HEPA vacuuming as appropriate and return tools and equipment to outside work area.

28) HEPA vacuum coveralls

- a) If two disposable coveralls are used:
 - 11 While wearing respirator, remove outer coveralls in work area
 - u Place coveralls in disposal bag
 - n Enter decon with disposal bag
 - n Remove remaining coveralls and place in disposal bag
- b) If one set of coveralls are used:
 - n While wearing respirator, HEPA vacuum coveralls while in work area
 - 11 Enter decon and remove coveralls, place in disposal bag
- c) If street clothes are contaminated
 - HEPA vacuum while in decon
 - u Remove and place indisposal bag
 - n Clothes must be disposed of or cleaned as ACM
- 29) Complete personal air monitoring work.
 - u Stop pump
 - u Remove cassette. Be sure to cap all openings
 - to Complete chain of custody and send to EH&S
- 30) Wash hands, face and respirator while standing in decon
 - use disposable towels and clean water
 - **u** Wash hands, face, and surface of respirator.

NOTE: DO NOT BREAK SEAL BETWEEN FACE AND RESPIRATOR

- n Place towels into disposal bag and seal.
- 31) At this point all waste will be double bagged before leaving decon.
- 32) Once all waste is double bagged remove respirator; cleaning and storing according to Respiratory Protection program
- 33) Return decontaminated tools, equipment and remaining materials to storage area.
- 34) Remove lockout tags and restart HVAC/electrical system(s).
- 35) Restore normal accessibility to work area.



- 36) Transport waste to designated asbestos waste storage area.
 - Waste should be lifted and carried, or transported in wheeled carts, when moved from one area to another.
 - a DO NOT DRAG PACKAGED WASTE
 - a Packaged waste should be PLACED, NOT THROWN OR DROPPED, into vehicles and storage areas
 - n Lock all waste in West Virginia University's asbestos storage facility

Remove a small amount of spray-applied ACM surfacing above a drop ceiling (Enclosure Recommended)**

Example

The following are examples of work that can be performed using the procedures of this work practice. If job conditions vary from the examples, stop work and notify your supervisor.

a Removing ACM fireproofing from a beam to permit new structural steel reinforcing and bracing to be welded inplace to reinforce a floor under a new file room.

Buildings

The following buildings are examples where these work practices can be applied.

- a Creative Arts Center
- 1:1 Law Center

Guidelines

- **ti** Two or more Asbestos workers are required to complete the scope of this work practice.
- **ti** If there is any visible ACM debris on top of the ceiling tiles or if fallout of debris or dust cannot adequately be controlled, then an enclosure is required to protect the building environment.
- ti Airborne asbestos is released at the ceiling line when debris is disturbed by lifting a tile. The use of a HEPA vacuum at the point of disturbance will collect these airborne fibers. The negative pressure inside a properly installed enclosure helps draw airborne fibers away from the plenum. Asbestos is also released into the air at the floor line when debris lands on the floor. Prompt clean up will prevent additional release from the ACM being walked on. The enclosure helps contain these fibers, and the HEPA vacuum used to form a negative pressure will help collect them.

Notes

Negative pressure containments shall be constructed for this procedure, **unless, the erection or installation of a containment is likely to cause more disturbance to the ACM which may result in asbestos fiber release and unnecessary exposure to the worker. If an enclosure cannot be installed, contact the asbestos program manager for alternative work procedures.

This work practice is for individual small maintenance activities where the amount of debris involved can be contained in one 60"by 60" disposal bag. It is standard industry practice not to fill these bags more than one-third full, to allow for proper sealing and to guard against breakage. If more than this amount of debris is found, stop work, close ceiling, and notify your supervisor.

This work practice is **not** appropriate for other activities such as replacing ceiling panels in a room. The work practices are based on "T-bar" ceiling with lift out panels, but can be easily modified for Z-spline and other sorts of ceiling that provide plenum access.

Work Procedures

- 1) Obtain and review a copy of the work order and schedule for work.
- 2) The following is a checklist of tools, equipment, and materials recommended to perform the steps outlined below.

Tools, Equipment, and Materials

Utility knife Disposal bags with labels

GFCI's HEPA vacuum with attachments

Extension cords and adapters Respirators

Lockout tags Disposable coveralls

Temporary work lights Disposable towels or wet wipes

Ladder or scaffold for elevated work

Wet wipes or bucket with clean water

Asbestos barrier tape

Warning signs

Smoke test bulb and tubes Garden sprayer

Bone saw Amended water
Wire cutters Lockdown encapsulant
Tin snips Air monitoring equipment

Safety glasses

Air monitoring equipment
Glovebags (if required)

Polyethylene sheet Nylon Brush

In the event of a fiber release, see **Appendix D: Procedures for Fiber Release Episodes.**

- 3) Obtain required respirators. The minimum level of respirator for this procedure is a half face air-purifying respirator.
- 4) Move tools, equipment, and materials to work area.
- 5) Secure work area

Duct tape

- c Vacate work area to prevent building occupant exposure
- a Restrict work area using barrier tape, signage, or partitions.

NOTE: Signage should read 'DANGER" or "KEEP OUT OF CONSTRUCTION AREA"

In high occupancy areas, put up a secondary barrier to prevent unauthorized access to work area.

<u>For example</u>: Black plastic, plywood partitions, or locking all doors to work area.

6) Lockout electrical systems that may create a hazard during O&M activities.

NOTE: Lockout tags should note when and why power is shut down and the personnel performing the lockout. There should only be one key for each lock used on lockout tags to prevent accidental reactivation of equipment.

- 7) Pre-clean work area if visible dust or debris is present, using one or more of the following techniques.
 - a Pick up dust/debris with HEPA vacuum
 - a Wet wipe non-porous surfaces
 - 1:1 HEPA vacuum surfaces not able to be wiped
 - 1:1 Clean carpeting using steam cleaner or HEPA vacuum
- 8) The competent person will determine if the room is to be prepped or a mini enclosure is to be used. Follow (a) and (b) below for prepping the room, or (c) for using a mini enclosure.
 - a) Install critical barriers within work area
 - u Close all openings with sheet plastic at least 6 mil thick
 - a Duct tape all cracks
 - a Seal the following with duct tape and polyethylene sheets
 - 1:1 Air intakes and returns
 - Light fixtures (being careful not to burn or melt plastic)
 - a Clocks
 - 1:1 Doorways
 - 1:1 Windows
 - 1:1 Convectors and speakers
 - All other openings
 - a Maintain all seals until the decontamination step is completed.
 - b) Place a polyethylene drop cloth
 - a Spread single layer on floor -be sure it covers an area large enough catch falling debris
 - a Stabilize sheet by using tape or weights
 - a Use caution not to tear plastic if working on soft flooring (carpet)



CAUTION: Drop cloth introduces a potential slip hazard; non-slip foot coverings are recommended

- c) Set up mini enclosure(s) when engineering and work practices are unable to control asbestos fiber release.
 - *ii* Two workers are necessary to set up and perform work in minienclosures
 - After enclosure is in place, check for, and clean up any debris generated by enclosure installation
 - ii Use a HEPA vacuum to obtain negative pressure
- 9) Place tools, equipment, and materials needed into the enclosure. Include HEPA vacuum inside the enclosure for vacuuming areas above the ceiling.
- 10) Enter secured work area to put on protective clothing.

NOTE: DO NOT put on disposable Tyvex coveralls in public areas

- *ii* Workers are required to wear appropriate PPE as directed by the competent person on site.
- 11) Air monitoring begins at this point.
- 12) Put on respirator and perform fit checks.
- 13) Carefully lift up ceiling panel while HEPA vacuuming around edges of the panel.
 - a) Remove any ACM debris and dust from the top of the ceiling panel or adjacent panels with the HEPA vacuum.
 - b) Keep panel as flat as possible while lifting panel.
 - c) Lift panel slightly above grid system and slowly slide panel to one side, leaving panel on top of adjacent panel.
 - d) Maintain nozzle of HEPA vacuum in operation above plane of the ceiling at all times that the ceiling is open.
- 14) Lightly mist plenum space on top side of ceiling where work will occur using garden sprayer with amended water.
- 15) Pick up any bulk debris on top of ceiling panels where work will occur and place into disposal bags.



- 16) HEPA vacuum ceiling suspension system and top side of ceiling where work will occur.
- 17) Wet fireproofing that is to be removed with amended water.
 - Allow water to soak through fireproofing to substrate.
 - **a** Apply more water as required to saturate fireproofing that is to be removed.
- 18) Scrape wetted fireproofing from steel.
 - a Hold a pan immediately under area being scraped to catch debris.
 - 11 Ifdry fireproofing is encountered, stop scraping, re-wet and allow water to soak in.
 - a Remove all wetted material.
 - a Promptly place removed fireproofing in a disposal bag.
 - After completing removal of fireproofing, spray pan with amended water and wet wipe to remove all fireproofing debris and residue.
- 19) Remove sufficient materials to permit installation of new structural steel reinforcement and braces.
 - a Remove sufficient material, from both sides of beam as necessary, in areas of steel that will be heated sufficiently by the welding to cause delamination of fireproofing.
- 20) After fireproofing is removed, wet surface of steel with amended water and wipe surface with paper towels.
 - Wet wipe until all residue is removed.
 - a After all residue is removed, wet wipe with clean water without surfactant.
 - Dispose of paper towels as asbestos waste.
- 21) HEPA vacuum surface of steel and edge of remaining fireproofing.
- 22) Apply a lockdown encapsulant, where required and as directed by the Competent Person, using an airless garden sprayer, to surfaces where ACM was removed or disturbed.

Note: See Appendix C for detailed Lockdown/Encapsulation Procedures.

- 23) Do not spray encapsulant on fireproofing or steel which fireproofing is to be applied without specific authorization from your supervisor. An inappropriate encapsulant could cause the fireproofing to fail and result in a life threatening situation.
- 24) Wet wipe or HEPA vacuum the underside of the panel which was moved.
- 25) Carefully replace ceiling panel.
- 26) Package and label asbestos waste for disposal.
 - a) Disposal bags should be collapsed by evacuating the air from the bag with the HEPA vacuum in the work area or enclosure.
 - b) Once collapsed, twist the bag to form a neck and wrap it tight with duct tape.
 - c) Fold neck of bag over to form a loop, then again wrap duct tape around neck and loop.
 - d) Place bag in decon.

Note: See Appendix B for specific labeling requirements.

27) Conduct visual inspection.

a

- a The person performing the inspection must be a Competent Person.
- 28) Remove drop cloth and/or mini-enclosure and dispose as contaminated asbestos waste.
- 29) Clean tools, equipment and work area using wet wiping and HEPA vacuuming as appropriate and return tools and equipment to outside work area.
- 30) HEPA vacuum coveralls
 - a) If two disposable coveralls are used:
 - a While wearing respirator, remove outer coveralls in work area
 - a Place coveralls in disposal bag
 - a Enter decon with disposal bag
 - a Remove remaining coveralls and place in disposal bag
 - b) If one set of coveralls are used:
 - a While wearing respirator, HEPA vacuum coveralls while in work area
 - a Enter decon and remove coveralls, place in disposal bag



- c) Ifstreet clothes are contaminated
 - t1 HEPA vacuum while in decon
 - tt Remove and place in disposal bag
 - a Clothes must be disposed of or cleaned as ACM
- 31) Complete personal air monitoring work.
 - a Stoppump
 - **u** Remove cassette. Be sure to cap all openings
 - 11 Complete chain of custody and send to EH&S
- 32) Wash hands, face and respirator while standing in decon
 - **u** Use disposable towels and clean water
 - tt Wash hands, face and surface of respirator.

NOTE: DO NOT BREAK SEAL BETWEEN FACE AND RESPIRATOR

- a Place towels into disposal bag and seal.
- 33) At this point all waste will be double bagged before leaving decon.
- 34) Once all waste is double bagged remove respirator; cleaning and storing according to Respiratory Protection program
- 35) Return decontaminated tools, equipment, and remaining materials to storage area.
- 36) Remove lockout tags and restart HVAC/electrical system(s).
- 37) Restore normal accessibility to work area.
- 38) Transport waste to designated asbestos waste storage area.
 - the Waste should be lifted and carried, or transported in wheeled carts, when moved from one area to another.
 - u DO NOT DRAG PACKAGED WASTE
 - **u** Packaged waste should be <u>PLACED</u>, NOT THROWN OR DROPPED, into vehicles and storage areas
 - a Lock all waste in West Virginia University's asbestos storage facility

Work in ceiling plenum space where exposed surfacing ACM is present in good condition (No Disturbance)

Example

The following are examples of work that can be performed using the procedures of this work practice. If job conditions vary from the examples, stop work and notify your supervisor.

- c Replace HVAC mixing box: above drop ceiling, below asbestos-containing plaster in good condition, where there is no ACM dust or debris on the mixing box or any of the systems in the area of the work. The plaster is near to the mixing box and may be contacted during the work.
- **c** Open or close one valve above ceiling where exposed plaster in good condition is present.
- a Inspect HVAC mixing box below asbestos-containing plaster or fireproofing in good condition.

Buildings

The following buildings are examples where these work practices can be applied.

Cl Creative Arts Center ti Law Center

Guidelines

- **ti** Generally, only one trained asbestos worker is necessary to complete the scope of this work practice.
- **ti** The procedure assumes that the ACM will not intentionally be disturbed during the work.
- **ti** Ifthere is any visible ACM debris on top of the ceiling tiles or if fallout of debris or dust cannot adequately be controlled, then an enclosure is required to protect the building environment.

tJ An employee with asbestos training may raise a drop ceiling panel to determine whether it can be safely removed based on the condition of surfacing and Thermal Surface Insulation (TSI) observed above. However, if any amount of debris is found, stop work, close ceiling, and notify supervisor.

Notes

This work practice should only be used in situations where: the ACM surfacing material is in good condition, there is no ACM dust and/or debris on top of ceiling tiles, and ACM above the ceiling will not be disturbed when the tile is lifted.

This work practice is **not** appropriate for other activities such as replacing ceiling panels in a room. The work practices are based on "T-bar" ceiling with lift out panels, but can be easily modified for Z-spline and other sorts of ceiling that provide plenum access.

ACM drop ceiling tiles (up to three) may be temporarily displaced to access areas over the ceiling if the ceiling tiles are in good condition, and no debris is observed above the ceiling, and the ceiling tiles may be removed without damaging the edges of the tiles.

Work Procedures

- 1) Obtain and review copies of work order and schedule work.
- 2) The following is a checklist of tools, equipment, and materials recommended to perform the steps outlined below.

Tools, Equipment, and Materials

GFCI's
Extension cords and adapters
Lockout tags
Temporary work lights
Ladder or scaffold for elevated work
Flashlight
Safety glasses

In the event of a fiber release, see **Appendix D: Procedures for Fiber Release Episodes.**

- 3) Move tools, equipment, and materials to work area.
- 4) Secure work area
 - a Vacate work area to prevent building occupant exposure
 - 11 Restrict work area using barrier tape, signage, or partitions.

NOTE: Signage should read 'DANGER' or 'KEEP OUT OF CONSTRUCTION AREA"

a In high occupancy areas, put up a secondary barrier to prevent unauthorized access to work area.

<u>For example</u>: Black plastic, plywood partitions, or locking all doors to work area.

- 5) Place ladder or scaffold in work area.
- 6) Carefully raise ceiling tile and inspect area for visible dust or debris.
 - If dust or debris is present, stop work, replace ceiling tile, and notify supervisor.

- 11 Ifno debris is present, carefully lift up the ceiling panel.
- ^{t1} Iflifting is obstructed by wires, ducts, conduit, etc., move to another panel.
- a Keep panel as flat as possible while lifting panel.
- Lift panel slightly above grid system and slowly slide panel to one side, leaving panel on top of an adjacent panel.
- 7) Complete observations and necessary work.
- 8) Return tools, equipment, and remaining materials to storage area.
- 9) Notify supervisor that work is completed and complete documentation.

Work in ceiling plenum space where exposed surfacing ACM in damaged condition is present (Enclosure Recommended)**

Example

The following are examples of work that can be performed using the procedures of this work practice. If job conditions vary from the examples, stop work and notify your supervisor.

- Replace HVAC mixing box above drop ceiling but below asbestos-containing plaster ceiling on lath that is in poor condition. There may be dust or debris from surfacing ACM on top of the mixing box. The mixing box is accessible and easily removed.
- Install new conduit (attached to existing supports) in plenum space where exposed fireproofing is present.
- Repair leak in non-ACM insulated water line above ceiling where exposed ACM plaster in poor condition is present.
- Maintain/replace HVAC mixing box below asbestos-containing fireproofing regardless of condition.

Buildings

The following buildings are examples where these work practices can be applied.

- 11 Creative Arts Center
- t1 Law Center

Guidelines

- **a** Two or more Asbestos workers are required to complete the scope of this work practice.
- This work practice covers situations where work must be performed in a ceiling plenum space that has exposed asbestos-containing spray-applied fireproofing or other surfacing material in damaged condition.

- If there is any visible ACM debris on top of the ceiling tiles or if fallout of debris or dust cannot adequately be controlled, then an enclosure is required to protect the building environment.
- Airborne asbestos is released at the ceiling line when debris is disturbed by lifting a tile. The use of a HEPA vacuum at the point of disturbance will collect these airborne fibers. The negative pressure inside a properly installed enclosure helps draw airborne fibers away from the plenum. Asbestos is also released into the air at the floor line when debris lands on the floor. Prompt clean up will prevent additional release from the ACM being walked on. The enclosure helps contain these fibers, and the HEPA vacuum used to form a negative pressure will help collect them.

Notes

Negative pressure containments shall be constructed for this procedure, **unless, the erection or installation of a containment is likely to cause more disturbance to the ACM which may result in asbestos fiber release and unnecessary exposure to the worker. If an enclosure cannot be installed, contact the asbestos program manager for alternative work procedures.

This work practice is for individual small maintenance activities where the amount of debris involved can be contained in one 60" by 60" disposal bag. It is standard industry practice not to fill these bags more than one-third full, to allow for proper sealing and to guard against breakage. If more than this amount of debris is found, stop work, close ceiling, and notify your supervisor.

This work practice is **not** appropriate for other activities such as replacing ceiling panels in a room. The work practices are based on "T-bar" ceiling with lift out panels, but can be easily modified for Z-spline and other sorts of ceiling that provide plenum access.

Work Procedures

- 1) Obtain and review a copy of the work order and schedule for work.
- 2) The following is a checklist of tools, equipment, and materials recommended to perform the steps outlined below.

Tools, Equipment, and Materials

Utility knife Disposal bags with labels

GFCI's HEPA vacuum with attachments

Extension cords and adapters Respirators

Lockout tags Disposable coveralls

Temporary work lights Disposable towels or wet wipes

Ladder or scaffold for elevated work

Asbestos barrier tape

Wet wipes or bucket with clean water Warning signs
Smoke test bulb and tubes Garden sprayer

Bone saw Amended water
Wire cutters Lockdown encapsulant
Tin snips Air monitoring equipment

Safety glasses Glovebags (if required)

Polyethylene sheet Nylon Brush

In the event of a fiber release, see **Appendix D: Procedures for Fiber Release Episodes.**

- 3) Obtain required respirators. The minimum level of respirator for this procedure is a half face air-purifying respirator.
- 4) Move tools, equipment, and materials to work area.
- 5) Secure work area

Duct tape

- 11 Vacate work area to prevent building occupant exposure
- Restrict work area using barrier tape, signage or partitions.

NOTE: Signage should read 'DANGER' or 'KEEP OUT OF CONSTRUCTION AREA"



In high occupancy areas, put up a secondary barrier to prevent unauthorized access to work area.

<u>For example</u>: Black plastic, plywood partitions, or locking all doors to work area.

6) Lockout electrical systems that may create a hazard during O&M activities.

NOTE: Lockout tags should note when and why power is shut down and the personnel performing the lockout. There should only be one key for each lock used on lockout tags to prevent accidental reactivation of equipment.

- 7) Pre-clean work area if visible dust or debris is present, using one or more of the following techniques.
 - a Pick up dust/debris with HEPA vacuum
 - Wet wipe non-porous surfaces
 - HEPA vacuum surfaces not able to be wiped
 - a Clean carpeting using steam cleaner or HEPA vacuum
- 8) The competent person will determine if the room is to be prepped or a mini enclosure is to be used. Follow (a) and (b) below for prepping the room, or (c) for using a mini enclosure.
 - a) Install critical barriers within work area
 - a Close all openings with sheet plastic at least 6 mil thick
 - a Ducttape all cracks
 - seal the following with duct tape and polyethylene sheets
 - 11 Air intakes and returns
 - a Light fixtures (being careful not to burn or melt plastic)
 - a Clocks
 - t1 Doorways
 - a Windows
 - a Convectors and speakers
 - a All other openings
 - a Maintain all seals until the decontamination step is completed.
 - b) Place a polyethylene drop cloth
 - a Spread single layer on floor -be sure it covers an area large enough catch falling debris
 - a Stabilize sheet by using tape or weights



a Use caution not to tear plastic if working on soft flooring (carpet)

CAUTION: Drop cloth introduces a potential slip hazard; non-slip foot coverings are recommended

- c) Set up mini enclosure(s) when engineering and work practices are unable to control asbestos fiber release.
 - n Two workers are necessary to set up and perform work in minienclosures
 - th After enclosure is in place, check for, and clean up any debris generated by enclosure installation
 - n Use a HEPA vacuum to obtain negative pressure
- 9) Place tools, equipment, and materials needed into the enclosure. Include HEPA vacuum inside the enclosure for vacuuming areas above the ceiling.
- 10) Enter secured work area to put on protective clothing.

NOTE: DO NOT put on disposable Tyvex coveralls in public areas

- n Workers are required to wear appropriate PPE as directed by the competent person on site.
- 11) Air monitoring begins at this point.
- 12) Put on respirator and perform fit checks.
- 13) Carefully lift up ceiling panel while HEPA vacuuming around edges of the panel.
 - a) Remove any ACM debris and dust from the top of the ceiling panel or adjacent panels with the HEPA vacuum.
 - b) Keep panel as flat as possible while lifting panel.
 - c) Lift panel slightly above grid system and slowly slide panel to one side, leaving panel on top of adjacent panel.
 - d) Maintain nozzle of HEPA vacuum in operation above plane of the ceiling at all times that the ceiling is open.
- 14) Lightly mist plenum space on top side of ceiling where work will occur using garden sprayer with amended water.
- 15)Pick up any bulk debris on top of ceiling panels where work will occur and place into disposal bags.



- 16) HEPA vacuum ceiling suspension system and top side of ceiling where work will occur.
- 17) HEPA vacuum top side of ceiling within reach from access area, and HEPA vacuum and wet-wipe item to be repaired or replaced.
- 18)Remove accessible overspray on mixing box, ductwork, hangers, conduit, etc. that may be disturbed by the work.
 - Remove overspray by dampening with amended water and collecting with the nozzle of the HEPA vacuum where possible.
 - the In locations where the material cannot be collected directly with the HEPA vacuum, wet thoroughly with amended water and manually collect into an asbestos disposal bag.
- 19) After bulk overspray is removed, wet newly exposed areas and use scraper and nylon brush to remove remaining visible residual ACM.
 - a Thoroughly wet wipe surface to remove all residue of ACM
- 20) Perform maintenance work required.
- 21)) Apply a lockdown encapsulant, where required and as directed by the Competent Person, using an airless garden sprayer, to surfaces where ACM was removed or disturbed.

Note: See Appendix C for detailed Lockdown/Encapsulation Procedures.

- 22) Do not spray encapsulant on fireproofing or steel which fireproofing is to be applied without specific authorization from your supervisor. An inappropriate encapsulant could cause the fireproofing to fail and result in a life threatening situation.
- 23) Wet wipe or HEPA vacuum the underside of the panel which was moved.
- 24) Carefully replace ceiling panel.
- 25) Package and label asbestos waste for disposal.
 - a) Disposal bags should be collapsed by evacuating the air from the bag with the HEPA vacuum in the work area or enclosure.
 - b) Once collapsed, twist the bag to form a neck and wrap it tight with duct tape.



- c) Fold neck of bag over to form a loop, then again wrap duct tape around neck and loop.
- d) Place bag in decon.

Note: See Appendix B for specific labeling requirements.

- 26) Conduct visual inspection.
 - a The person performing the inspection must be a Competent Person.
- 27) Remove drop cloth and/or mini-enclosure and dispose as contaminated asbestos waste.
- 28) Clean tools, equipment and work area using wet wiping and HEPA vacuuming as appropriate and return tools and equipment to outside work area.
- 29) HEPA vacuum coveralls
 - a) If two disposable coveralls are used:
 - a While wearing respirator, remove outer coveralls in work area
 - tt Place coveralls in disposal bag
 - a Enter decon with disposal bag
 - a Remove remaining coveralls and place in disposal bag
 - b) If one set of coveralls are used:
 - n While wearing respirator, HEPA vacuum coveralls while in work area
 - n Enter decon and remove coveralls, place in disposal bag
 - c) If street clothes are contaminated
 - a HEPA vacuum while in decon
 - tt Remove and place in disposal bag
 - 11 Clothes must be disposed of or cleaned as ACM
- 30) Complete personal air monitoring work.
 - n Stop pump
 - a Remove cassette. Be sure to cap all openings
 - n Complete chain of custody and send to EH&S
- 31) Wash hands, face and respirator while standing in decon



- a Use disposable towels and clean water
- Wash hands, face and surface of respirator.

NOTE: DO NOT BREAK SEAL BETWEEN FACE AND RESPIRATOR

- a Place towels into disposal bag and seal.
- 32) At this point all waste will be double bagged before leaving decon.
- 33) Once all waste is double bagged remove respirator; cleaning and storing according to Respiratory Protection program
- 34) Return decontaminated tools, equipment, and remaining materials to storage area.
- 35) Remove lockout tags and restart HVAC/electrical system(s).
- 36) Restore normal accessibility to work area.
- 37) Transport waste to designated asbestos waste storage area.
 - **a** Waste should be lifted and carried, or transported in wheeled carts, when moved from one area to another.
 - a DONOT DRAG PACKAGED WASTE
 - **a** Packaged waste should be <u>PLACED</u>, NOT THROWN OR DROPPED, into vehicles and storage areas
 - a Lock all waste in West Virginia University's asbestos storage facility

Install wiring in plenum space where exposed surfacing ACM is present ingood condition (No Disturbance)

Example

The following are examples of work that can be performed using the procedures of this work practice. If job conditions vary from the examples, stop work and notify your supervisor.

Installing new plenum rated computer or telephone cables that will rest on top of ceiling, where ACM plaster is in good condition and well out of reach of the work, and there is no ACM dust and/or debris on top of ceiling tiles.

Buildings

The following buildings are examples where these work practices can be applied.

- D Creative Arts Center
- s:s Law Center

Guidelines

- Generally, only one trained asbestos worker is necessary to complete the scope of this work practice.
- The procedure assumes that the ACM will not intentionally be disturbed during the work.
- a Routinely, the installation of computer and telephone cables is done without removing enough ceiling tiles. Consequently, the cable is dragged long distances on top of the ceiling, rattling the ceiling. This vibration shakes the ceiling's hanging system, and may vibrate an overhead ACM surfacing material.
- If there is any visible ACM debris on top of the ceiling tiles or if fallout of debris or dust cannot adequately be controlled, then an enclosure is required to protect the building environment.

An employee with asbestos training may raise a drop ceiling panel to determine whether it can be safely removed based on the condition of surfacing and Thermal Surface Insulation (TSI) observed above. However, if any amount of debris is found, stop work, close ceiling, and notify supervisor.

Notes

This work practice should only be used in situations where: the ACM surfacing material is in good condition, there is no ACM dust and/or debris on top of ceiling tiles, and ACM above the ceiling will not be disturbed when the tile is lifted.

This work practice is **not** appropriate for other activities such as replacing ceiling panels in a room. The work practices are based on "T-bar" ceiling with lift out panels, but can be easily modified for Z-spline and other sorts of ceiling that provide plenum access.

ACM drop ceiling tiles (up to three) may be temporarily displaced to access areas over the ceiling if the ceiling tiles are in good condition, and no debris is observed above the ceiling, and the ceiling tiles may be removed without damaging the edges of the tiles.

Work Procedures

- 1) Obtain and review copies of work order and schedule work.
- 2) The following is a checklist of tools, equipment, and materials recommended to perform the steps outlined below.

Tools, Equipment, and Materials

GFCI's
Extension cords and adapters
Lockout tags
Temporary work lights
Ladder or scaffold for elevated work
Flashlight
Safety glasses

In the event of a fiber release, see **Appendix D: Procedures for Fiber Release Episodes.**

- 3) Move tools, equipment, and materials to work area.
- 4) Secure work area
 - Vacate work area to prevent building occupant exposure
 - Restrict work area using barrier tape, signage, or partitions.

NOTE: Signage should read 'DANGER' or 'KEEP OUT OF CONSTRUCTION AREA"

In high occupancy areas, put up a secondary barrier to prevent unauthorized access to work area.

<u>For example</u>: Black plastic, plywood partitions, or locking all doors to work area.

- 5) Obtain access above ceiling using appropriate O&M work practice.
- 6) Observe top of ceiling in direction that cables are to be run.
 - Determine conditions at the next location where access above the ceiling is required to determine the level of work practice required for entry.



- 11 If there is any ACM debris or dust observed on top of ceiling tiles, top work, close the ceiling, and notify the supervisor.
- a All ACM dust and debris must be removed by appropriately trained and protected Asbestos Level II employees using the appropriate work practice(s) before preceeding.
- 7) Open enough ceiling tiles that the cables can be passed by hand from opening to opening.
- 8) Install cable(s) by passing leading end of cable(s) from opening to opening.
 - a DO NOT TOSS CABLES OR ANY OTHER OBJECT ABOVE THE CEILING.
- 9) Return tools, equipment, and remaining materials to storage area.
- 10) Notify supervisor that work is completed and complete documentation.

Install wiring in plenum space where exposed ACM fireproofing or damaged ACM is present (Enclosure Recommended)**

Example

The following are examples of work that can be performed using the procedures of this work practice. If job conditions vary from the examples, stop work and notify your supervisor.

Installing new plenum rated computer or telephone cables that will lay on top of ceiling where there is ACM debris on top of the ceiling tiles, where damaged ACM materials are present, or where the ACM surfacing material is near enough to the work that it is inevitably going to be disturbed and abraded by the cable installation in a manner that could release asbestos fibers or visible dust and debris into the air.

Buildings

The following buildings are examples where these work practices can be applied.

- 1:1 Creative Arts Center
- a Law Center

Guidelines

- **a** Two or more Asbestos workers are required to complete the scope of this work practice.
- a This work practice covers situations where wiring or conduit is being installed in a ceiling plenum space that has exposed spray-applied ACM fireproofing, ACM in damaged condition, or ACM dust/debris.
- a This work practice should be used where ACM will be disturbed by the cable; and it is difficult to prevent the generation of airborne asbestos or the spread of visible debris and/or dust. It is best to limit this type of work to outside abatement

contractors who are accustomed to working on environments with elevated asbestos levels.

- c Routinely, the installation of computer and telephone cables is done without removing enough ceiling tile. Consequently, the cable is dragged long distances on top of the ceiling, rattling the ceiling. This vibration shakes the ceiling's hanging system, and may vibrate ACM fireproofing, damaged ACM, or ACM debris overhead. A worker can shake this material loose, without ever touching the material, simply by causing the ceiling to vibrate. The vibrations can cause release of airborne asbestos fibers.
- **c** If there is any visible ACM debris on top of the ceiling tiles or if fallout of debris or dust cannot adequately be controlled, then an enclosure is required to protect the building environment.
- Airborne asbestos is released at the ceiling line when debris is disturbed by lifting a tile. The use of a HEPA vacuum at the point of disturbance will collect these airborne fibers. The negative pressure inside a properly installed enclosure helps draw airborne fibers away from the plenum. Asbestos is also released into the air at the floor line when debris lands on the floor. Prompt clean up will prevent additional release from the ACM being walked on. The enclosure helps contain these fibers, and the HEPA vacuum used to form a negative pressure will help collect them.

Notes

Negative pressure containments shall be constructed for this procedure, **unless, the erection or installation of a containment is likely to cause more disturbance to the ACM which may result in asbestos fiber release and unnecessary exposure to the worker. If an enclosure cannot be installed, contact the asbestos program manager for alternative work procedures.

This work practice is for individual small maintenance activities where the amount of debris involved can be contained in one 60" by 60" disposal bag. It is standard industry practice not to fill these bags more than one-third full, to allow for proper sealing and to guard against breakage. Ifmore than this amount of debris is found, stop work, close ceiling, and notify your supervisor.

This work practice is **not** appropriate for other activities such as replacing ceiling panels in a room. The work practices are based on "T-bar" ceiling with lift out panels, but can be easily modified for Z-spline and other sorts of ceiling that provide plenum access.



Work Procedures

- 1) Obtain and review a copy of the work order and schedule for work.
- 2) The following is a checklist of tools, equipment, and materials recommended to perform the steps outlined below.

Tools, Equipment, and Materials

Utility knife Disposal bags with labels

GFCI's HEPA vacuum with attachments

Extension cords and adapters Respirators

Lockout tags Disposable coveralls

Temporary work lights Disposable towels or wet wipes

Ladder or scaffold for elevated work

Wet wipes or bucket with clean water

Warning signs

Smoke test bulb and tubes Garden sprayer

Bone saw Amended water
Wire cutters Lockdown encapsulant
Tin snips Air monitoring equipment

Safety glasses

Glovebags (if required)

Polyethylene sheet Nylon Brush

In the event of a fiber release, see **Appendix D: Procedures for Fiber Release**

Episodes.

Duct tape

- 3) Obtain required respirators. The minimum level of respirator for this procedure is a half face air-purifying respirator.
- 4) Move tools, equipment, and materials to work area.
- 5) Secure work area
 - c Vacate work area to prevent building occupant exposure
 - ม Restrict work area using barrier tape, signage, or partitions.



NOTE: Signage should read 'DANGER" or 'KEEP OUT OF CONSTRUCTION AREA"

a In high occupancy areas, put up a secondary barrier to prevent unauthorized access to work area.

For example: Black plastic, plywood partitions, or locking all doors to work area.

6) Lockout electrical systems that may create a hazard during O&M activities.

NOTE: Lockout tags should note when and why power is shut down and the personnel performing the lockout. There should only be one key for each lock used on lockout tags to prevent accidental reactivation of equipment.

- 7) Pre-clean work area if visible dust or debris is present, using one or more of the following techniques.
 - a Pick up dust/debris with HEPA vacuum
 - a Wet wipe non-porous surfaces
 - a HEPA vacuum surfaces not able to be wiped
 - n Clean carpeting using steam cleaner or HEPA vacuum
- 8) The competent person will determine if the room is to be prepped or a mini enclosure is to be used. Follow (a) and (b) below for prepping the room, or (c) for using a mini enclosure.
 - a) Install critical barriers within work area
 - n Close all openings with sheet plastic at least 6 mil thick
 - a Duct tape all cracks
 - a Seal the following with duct tape and polyethylene sheets
 - n Air intakes and returns
 - # Light fixtures (being careful not to burn or melt plastic)
 - u Clocks
 - **u** Doorways
 - a Windows
 - **a** Convectors and speakers
 - a All other openings
 - a Maintain all seals until the decontamination step is completed.

- b) Place a polyethylene drop cloth
 - n Spread single layer on floor -be sure it covers an area large enough catch falling debris
 - tt Stabilize sheet by using tape or weights
 - Use caution not to tear plastic if working on soft flooring (carpet)

CAUTION: Drop cloth introduces a potential slip hazard; non-slip foot coverings are recommended

- c) Set up mini enclosure(s) when engineering and work practices are unable to control asbestos fiber release.
 - n Two workers are necessary to set up and perform work in minienclosures
 - # After enclosure is in place, check for, and clean up any debris generated by enclosure installation
 - n Use a HEPA vacuum to obtain negative pressure
- 9) Place tools, equipment, and materials needed into the enclosure. Include HEPA vacuum inside the enclosure for vacuuming areas above the ceiling.
- 10) Enter secured work area to put on protective clothing.

NOTE: DO NOT put on disposable Tyvex coveralls in public areas

- **n** Workers are required to wear appropriate PPE as directed by the competent person on site.
- 11) Air monitoring begins at this point.
- 12) Put on respirator and perform fit checks.
- 13) Carefully lift up ceiling panel while HEPA vacuuming around edges of the panel.
 - a) Remove any ACM debris and dust from the top of the ceiling panel or adjacent panels with the HEPA vacuum.
 - b) Keep panel as flat as possible while lifting panel.
 - c) Lift panel slightly above grid system and slowly slide panel to one side, leaving panel on top of adjacent panel.
 - d) Maintain nozzle of HEPA vacuum in operation above plane of the ceiling at all times that the ceiling is open.



- 14) Lightly mist plenum space on top side of ceiling where work will occur using garden sprayer with amended water.
- 15) Pick up any bulk debris on top of ceiling panels where work will occur and place into disposal bags.
- 16)HEPA vacuum top side of ceiling within reach from access area, and HEPA vacuum and wet-wipe item to be repaired or replaced.
- 17) Observe top of ceiling in direction that cables are to be run.
 - n Determine conditions at the next location where access above the ceiling is required to determine the level of work practice required for entry.
 - n Locate the next ceiling access so that ceiling access and disturbance of ACM occurs in a mini-enclosure and so that all parts of the ceiling top can be called.
- 18) Prior to installation of cable past ACM:
 - a) Mist any ACM material that is to be disturbed with amended water, and install a drop cloth at ceiling level to catch debris.
 - b) During cable installation hold the HEPA vacuum nozzle under the point of disturbance, if possible.
 - c) Wet wipe cable after it is run past ACM.
 - d) Run complete length of cable needed and coil on other side of ACM.
 - e) Saturate any debris on drop cloth with amended water and mist the air between the ACM and drop cloth.
 - f) Fold drop cloth with debris inside and place in an asbestos disposal bag.
 - g) Clean up any other debris and place in an asbestos disposal bag.
- 19) Apply a lockdown encapsulant, where required and as directed by the Competent Person, using an airless garden sprayer, to surfaces where ACM was removed or disturbed.

Note: See Appendix C for detailed Lockdown/Encapsulation Procedures.

- 20) Do not spray encapsulant on fireproofing or steel which fireproofing is to be applied without specific authorization from your supervisor. An inappropriate encapsulant could cause the fireproofing to fail and result in a life threatening situation.
- 21) Wet wipe or HEPA vacuum the underside of the panel which was moved.



- 22) Carefully replace ceiling panel.
- 23) Package and label asbestos waste for disposal.
 - a) Disposal bags should be collapsed by evacuating the air from the bag with the HEPA vacuum in the work area or enclosure.
 - b) Once collapsed, twist the bag to form a neck and wrap it tight with duct tape.
 - c) Fold neck of bag over to form a loop, then again wrap duct tape around neck and loop.
 - d) Place bag in decon.

Note: See Appendix B for specific labeling requirements.

- 24) Conduct visual inspection.
 - a The person performing the inspection must be a Competent Person.
- 25) Remove drop cloth and/or mini-enclosure and dispose as contaminated asbestos waste.
- 26) Clean tools, equipment, and work area using wet wiping and HEPA vacuuming as appropriate and return tools and equipment to outside work area.
- 27) HEPA vacuum coveralls
 - a) If two disposable coveralls are used:
 - a While wearing respirator, remove outer coveralls inwork area
 - tt Place coveralls in disposal bag
 - tt Enter decon with disposal bag
 - a Remove remaining coveralls and place in disposal bag
 - b) Ifone set of coveralls are used:
 - a While wearing respirator, HEPA vacuum coveralls while in work area
 - a Enter decon and remove coveralls, place in disposal bag
 - c) If street clothes are contaminated
 - a HEPA vacuum while in decon
 - tt Remove and place in disposal bag
 - tt Clothes must be disposed of or cleaned as ACM



- 28) Complete personal air monitoring work.
 - 11 Stoppump
 - a Remove cassette. Be sure to cap all openings
 - 11 Complete chain of custody and send to EH&S
- 29) Wash hands, face and respirator while standing in decon
 - use disposable towels and clean water
 - Wash hands, face, and surface of respirator.

I NOTE: DO NOT BREAK SEAL BETWEEN FACE AND RESPIRATOR

- a Place towels into disposal bag and seal.
- 30) At this point all waste will be double bagged before leaving decon.
- 31) Once all waste is double bagged remove respirator; cleaning and storing according to Respiratory Protection program
- 32) Return decontaminated tools, equipment, and remaining materials to storage area.
- 33) Remove lockout tags and restart RVAC/electrical system(s).
- 34) Restore normal accessibility to work area.
- 35) Transport waste to designated asbestos waste storage area.
 - Waste should be lifted and carried, or transported in wheeled carts, when moved from one area to another.
 - t1 DO NOT DRAG PACKAGED WASTE
 - Packaged waste should be PLACED, NOT THROWN OR DROPPED, into vehicles and storage areas
 - a Lock all waste in West Virginia University's asbestos storage facility

Attach item to ceiling finished with ACM surfacing material in good condition (Enclosure Recommended)**

Example

The following are examples of work that can be performed using the procedures of this work practice. If job conditions vary from the examples, stop work and notify your supervisor.

- a Remove a small amount of acoustical plaster using a glove box or frame mounted glovebag, to permit the installation of ajunction box.
- a Install smoke detector in suspended acoustical plaster ceiling by cutting a 2"x 4" hole and installing ajunction box.
- a Attach track lighting system to ACM: finished ceiling.
- Install exposed conduit, junction boxes and light fixtures to ACM finished ceiling.
- Attach new folding door to acoustical plaster where structural modifications are not needed for support.
- **a** Mount an overhead projector requiring hardware attachment and cable installation.

Buildings

The following buildings are examples where these work practices can be applied.

- t1 Percival Hall
- 11 Agriculture Sciences

Guidelines

- Two or more Asbestos workers are required to complete the scope of this work practice.
- This work practice describes the work required to attach an item to a ceiling finished with surfacing ACM, such as acoustical plaster or decorative sprayed-on surface texture material.

Notes

Negative pressure containments shall be constructed for this procedure, **unless, the erection or installation of a containment is likely to cause more disturbance to the ACM which may result in asbestos fiber release and unnecessary exposure to the worker. If an enclosure cannot be installed, contact the asbestos program manager for alternative work procedures.

This work practice is for individual small maintenance activities where the amount of debris involved can be contained in one 60"by 60" disposal bag. It is standard industry practice not to fill these bags more than one-third full, to allow for proper sealing and to guard against breakage. If more than this amount of debris is found, stop work, close ceiling, and notify your supervisor.

Work Procedures

- I) Obtain and review a copy of the work order and schedule for work.
- 2) The following is a checklist of tools, equipment, and materials recommended to perform the steps outlined below.

Tools, Equipment, and Materials

Utility knife Disposal bags with labels

GFCI's HEPA vacuum with attachments

Extension cords and adapters Respirators

Lockout tags Disposable coveralls

Temporary work lights Disposable towels or wet wipes

Ladder or scaffold for elevated work

Asbestos barrier tape

Wet wipes or bucket with clean water Warning signs

Smoke test bulb and tubes

Garden sprayer

Amended water

Wire cutters
Lockdown encapsulant
Tin snips
Air monitoring equipment

Safety glasses

Glovebags (if required)

Polyethylene sheet Nylon Brush Duct tape

In the event of a fiber release, see **Appendix D: Procedures for Fiber Release Episodes.**

- 3) Obtain required respirators. The minimum level of respirator for this procedure is a half face air-purifying respirator.
- 4) Move tools, equipment, and materials to work area.
- 5) Secure work area
 - 12 Vacate work area to prevent building occupant exposure
 - Restrict work area using barrier tape, signage, or partitions.

NOTE: Signage should read 'DANGER' or 'KEEP OUT OF CONSTRUCTION AREA'

In high occupancy areas, put up a secondary barrier to prevent unauthorized access to work area.

<u>For example</u>: Black plastic, plywood partitions, or locking all doors to work area.

6) Lockout electrical systems that may create a hazard during O&M activities.

NOTE: Lockout tags should note when and why power is shut down and the personnel performing the lockout. There should only be one key for each lock used on lockout tags to prevent accidental reactivation of equipment.

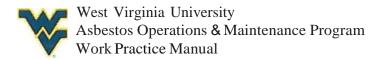
- 7) Pre-clean work area if visible dust or debris is present, using one or more of the following techniques.
 - 11 Pick up dust/debris with HEPA vacuum
 - to Wet wipe non-porous surfaces
 - ri HEPA vacuum surfaces not able to be wiped
 - 151 Clean carpeting using steam cleaner or HEPA vacuum
- 8) The competent person will determine if the room is to be prepped or a mini enclosure is to be used. Follow (a) and (b) below for prepping the room, or (c) for using a mini enclosure.
 - a) Install critical barriers within work area
 - a Close all openings with sheet plastic at least 6 mil thick
 - a Duct tape all cracks
 - a Seal the following with duct tape and polyethylene sheets
 - 11 Air intakes and returns
 - a Light fixtures (being careful not to burn or melt plastic)
 - a Clocks
 - a Doorways
 - 11 Windows
 - a Convectors and speakers
 - a All other openings
 - **a** Maintain all seals until the decontamination step is completed.
 - b) Place a polyethylene drop cloth
 - a Spread single layer on floor be sure it covers an area large enough catch falling debris
 - **u** Stabilize sheet by using tape or weights
 - a Use caution not to tear plastic if working on soft flooring (carpet)

CAUTION: Drop cloth introduces a potential slip hazard; non-slip foot coverings are recommended

- c) Set up mini enclosure(s) when engineering and work practices are unable to control asbestos fiber release.
 - **a** Two workers are necessary to set up and perform work in minienclosures
 - the After enclosure is in place, check for, and clean up any debris generated by enclosure installation
 - a Use a HEPA vacuum to obtain negative pressure
- 9) Place tools, equipment and materials needed into the enclosure. Include HEPA vacuum inside the enclosure for vacuuming areas above the ceiling.
- 10) Enter secured work area to put on protective clothing.

NOTE: DO NOT put on disposable Tyvex coveralls in public areas

- **a** Workers are required to wear appropriate PPE as directed by the competent person on site.
- 11) Air monitoring begins at this point.
- 12) Put on respirator and perform fit checks.
- 13)Enter enclosure and wet area on ceiling where item will be attached using garden sprayer with amended water.
 - a Allow amended water to sink in.
 - **a** Add additional water until area to be removed is saturated.
- 14)Using a small scraper remove acoustical plaster from scratch coat to a point Yz'' back from opening required for junction box.
 - **a** Hold a pan immediately under area to catch debris while scraping.
- 15)After acoustical plaster is removed wet surface of scratch coat and remove all residue with a stiff nylon brush.
- 16)After all visible residue has been removed, remove 1/16" from surface of scratch coat.



- 17) Spray scratch coat and edges of acoustical plaster with clear penetrating encapsulant.
- 18) Mark location for junction box installation.
- 19)Drill starter holes in opposite comers with drill equipped with dust collection collar attached to an operating HEPA vacuum.
- 20) Cut through scratch coat and wire lath between starter holes with pneumatic shear, or heavy tin snips.
 - ii Keep scratch coat dampened with amended water during cutting.
- 21) Install old-work junction box.
- 22) Immediately put all asbestos and non-asbestos waste and debris in an asbestos disposal bag.
- 23) Apply a lockdown encapsulant, where required and as directed by the Competent Person, using an airless garden sprayer, to surfaces where ACM was removed or disturbed.

Note: See Appendix C for detailed Lockdown/Encapsulation Procedures.

- 24) Do not spray encapsulant on fireproofing or steel which fireproofing is to be applied without specific authorization from your supervisor. An inappropriate encapsulant could cause the fireproofing to fail and result in a life threatening situation.
- 25) Wet wipe or HEPA vacuum the underside of the panel which was moved.
- 26) Carefully replace ceiling panel.
- 27) Package and label asbestos waste for disposal.
 - a) Disposal bags should be collapsed by evacuating the air from the bag with the HEPA vacuum in the work area or enclosure.
 - b) Once collapsed, twist the bag to form a neck and wrap it tight with duct tape.
 - c) Fold neck of bag over to form a loop, then again wrap duct tape around neck and loop.
 - d) Place bag in decon.

Note: See Appendix B for specific labeling requirements.

- 28) Conduct visual inspection.
 - The person performing the inspection must be a Competent Person.
- 29) Remove drop cloth and/or mini-enclosure and dispose as contaminated asbestos waste.
- 30) Clean tools, equipment and work area using wet wiping and HEPA vacuuming as appropriate and return tools and equipment to outside work area.
- 31) HEPA vacuum coveralls
 - a) If two disposable coveralls are used:
 - While wearing respirator, remove outer coveralls inwork area
 - tt Place coveralls in disposal bag
 - ¹¹ Enter decon with disposal bag
 - 11 Remove remaining coveralls and place in disposal bag
 - b) Ifone set of coveralls are used:
 - While wearing respirator, HEPA vacuum coveralls while in work area
 - H Enter decon and remove coveralls, place in disposal bag
 - c) If street clothes are contaminated
 - HEPA vacuum while in decon
 - tt Remove and place in disposal bag
 - rd Clothes must be disposed of or cleaned as ACM
- 32) Complete personal air monitoring work.
 - t1 Stop pump
 - **u** Remove cassette. Be sure to cap all openings
 - u Complete chain of custody and send to EH&S
- 33) Wash hands, face and respirator while standing in decon
 - **u** Use disposable towels and clean water
 - a Wash hands, face and surface of respirator.

I NOTE: DO NOT BREAK SEAL BETWEEN FACE AND RESPIRATOR

¹¹ Place towels into disposal bag and seal.

- 34) At this point all waste will be double bagged before leaving decon.
- 35) Once all waste is double bagged remove respirator; cleaning and storing according to Respiratory Protection program
- 36) Return decontaminated tools, equipment and remaining materials to storage area.
- 37) Remove lockout tags and restart HVAC/electrical system(s).
- 38) Restore normal accessibility to work area.
- 39) Transport waste to designated asbestos waste storage area.
 - Waste should be lifted and carried, or transported in wheeled carts, when moved from one area to another.
 - a DONOT DRAG PACKAGED WASTE
 - # Packaged waste should be PLACED, NOT THROWN OR DROPPED, into vehicles and storage areas
 - a Lock all waste in West Virginia University's asbestos storage facility

810

Repair or replace item in surface finished with ACM (No Disturbance)

Example

The following are examples of work that can be performed using the procedures of this work practice. If job conditions vary from the examples, stop work and notify your supervisor.

Replace diffuser that is completely surrounded by the metal frame of a light fixture recessed in a ceiling finished with ACM acoustical plaster, where the diffuser can be removed without any disturbance to ACM.

Buildings

The following buildings are examples where these work practices can be applied.

- t1 Admissions and Records
- tl Law Center

Guidelines

- **c** Generally, only one trained asbestos worker is necessary to complete the scope of this work practice.
- This work practice covers the procedures for repairing or replacing an item that is installed in or attached to a surface finished with ACM, such as an acoustical plaster ceiling.

Work Procedures

- 1) Obtain and review copies of work order and schedule work.
- 2) The following is a checklist of tools, equipment, and materials recommended to perform the steps outlined below.

Tools, Equipment, and Materials

GFCI's
Extension cords and adapters
Lockout tags
Temporary work lights
Ladder or scaffold for elevated work
Flashlight
Safety glasses

In the event of a fiber release, see **Appendix D: Procedures for Fiber Release Episodes.**

- 3) Move tools, equipment, and materials to work area.
- 4) Secure work area
 - Vacate work area to prevent building occupant exposure
 - 11 Restrict work area using barrier tape, signage, or partitions.

NOTE: Signage should read 'DANGER' or 'KEEP OUT OF CONSTRUCTION AREA"

11 In high occupancy areas, put up a secondary barrier to prevent unauthorized access to work area.

For example: Black plastic, plywood partitions, or locking all doors to work area.

- 5) Carefully open diffuser without touching the ACM acoustical plaster ceiling.
 - t1 Unhook diffuser from light fixture and remove.
 - 1:1 Replace diffuser.
 - 151 Do not touch ACM or rattle light fixture.
- 6) Return tools, equipment, and remaining materials to storage area.
- 7) Notify supervisor that work is completed and complete documentation.

Repair or replace item in surface finished with ACM (Enclosure Recommended)**

Example

The following are examples of work that can be performed using the procedures of this work practice. If job conditions vary from the examples, stop work and notify your supervisor.

Removal of a light fixture that is recessed in a ceiling finished with ACM acoustical plaster, where the fixture frame is integral with the ceiling and plaster must be removed and cut to free the fixture.

Buildings

The following buildings are examples where these work practices can be applied.

- t:t Agriculture Sciences Building
- to Percival Hall

Guidelines

- Two or more Asbestos workers are required to complete the scope of this work practice.
- This example pre-supposes that the light fixture is constructed so it is an integral part of the ceiling construction and has to be cut out of the ceiling. The minienclosure in this instance is a miniature asbestos abatement work area.

Notes

Negative pressure containments shall be constructed for this procedure, **unless, the erection or installation of a containment is likely to cause more disturbance to the ACM which may result in asbestos fiber release and unnecessary exposure to the worker. If an enclosure cannot be installed, contact the asbestos program manager for alternative work procedures.

This work practice is for individual small maintenance activities where the amount of debris involved can be contained in one 60" by 60" disposal bag. It is standard industry practice not to fill these bags more than one-third full, to allow for proper sealing and to guard against breakage. If more than this amount of debris is found, stop work, close ceiling, and notify your supervisor.

Work Procedures

- 1) Obtain and review a copy of the work order and schedule for work.
- 2) The following is a checklist of tools, equipment, and materials recommended to perform the steps outlined below.

Tools, Equipment, and Materials

Utility knife Disposal bags with labels

GFCI's HEPA vacuum with attachments

Extension cords and adapters Respirators

Lockout tags Disposable coveralls

Temporary work lights Disposable towels or wet wipes

Ladder or scaffold for elevated work

Asbestos barrier tape

Wet wipes or bucket with clean water Warning signs

Smoke test bulb and tubes

Garden sprayer

Amended water

Wire cutters

Tin snips

Lockdown encapsulant

Air monitoring equipment

Safety glasses Glovebags (if required)

Polyethylene sheet Nylon Brush Duct tape

In the event of a fiber release, see **Appendix D: Procedures for Fiber Release Episodes.**

- 3) Obtain required respirators. The minimum level of respirator for this procedure is a half face air-purifying respirator.
- 4) Move tools, equipment, and materials to work area.
- 5) Secure work area
 - Vacate work area to prevent building occupant exposure
 - Restrict work area using barrier tape, signage or partitions.

NOTE: Signage should read "DANGER" or "KEEP OUT OF CONSTRUCTION AREA"

In high occupancy areas, put up a secondary barrier to prevent unauthorized access to work area.



<u>For example</u>: Black plastic, plywood partitions, or locking all doors to work area.

6) Lockout electrical systems that may create a hazard during O&M activities.

NOTE: Lockout tags should note when and why power is shut down and the personnel performing the lockout. There should only be one key for each lock used on lockout tags to prevent accidental reactivation of equipment.

- 7) Pre-clean work area if visible dust or debris is present, using one or more of the following techniques.
 - H Pick up dust/debris with HEPA vacuum
 - a Wet wipe non-porous surfaces
 - HEPA vacuum surfaces not able to be wiped
 - a Clean carpeting using steam cleaner or HEPA vacuum
- 8) The competent person will determine if the room is to be prepped or a mini enclosure is to be used. Follow (a) and (b) below for prepping the room, or (c) for using a mini enclosure.
 - a) Install critical barriers within work area
 - a Close all openings with sheet plastic at least 6 mil thick
 - a Duct tape all cracks
 - Seal the following with duct tape and polyethylene sheets
 - a Air intakes and returns
 - a Light fixtures (being careful not to burn or melt plastic)
 - ti Clocks
 - ti Doorways
 - a Windows
 - a Convectors and speakers
 - a All other openings
 - a Maintain all seals until the decontamination step is completed.
 - b) Place a polyethylene drop cloth
 - Spread single layer on floor be sure it covers an area large enough catch falling debris
 - a Stabilize sheet by using tape or weights
 - a Use caution not to tear plastic if working on soft flooring (carpet)



CAUTION: Drop cloth.introduces a potential slip hazard; non-slip foot coverings are recommended

- c) Set up mini enclosure(s) when engineering and work practices are unable to control asbestos fiber release.
 - Two workers are necessary to set up and perform work in minienclosures
 - After enclosure is in place, check for, and clean up any debris generated by enclosure installation
 - Use a HEPA vacuum to obtain negative pressure
- 9) Place tools, equipment and materials needed into the enclosure. Include HEPA vacuum inside the enclosure for vacuuming areas above the ceiling.
- 10) Enter secured work area to put on protective clothing.

NOTE: DO NOT put on disposable Tyvex coveralls in public areas

- Workers are required to wear appropriate PPE as directed by the competent person on site.
- 11) Air monitoring begins at this point.
- 12)Put on respirator and perform fit checks.
- 13)Enter enclosure.
 - a) Wet area of surfacing within 6" of light fixture using garden sprayer containing amended water.
 - b) Allow water to soak in for several minutes.
 - c) Apply additional water as necessary until acoustical plaster is saturated in area adjacent to light fixture.
- 14)Using a small scraper, carefully remove wetted ACM acoustical finish down to scratch coat for 2" on all sides of light fixture.
 - n Hold a pan immediately under scraping area to catch debris.
 - *tt* At frequent intervals place ACM debris in asbestos disposal bag and spray with amended water.



- 15)After acoustical plaster is removed wet surface of scratch coat and remove all residue with a stiff nylon brush.
 - a Hold pan under brushing area to catch any debris.
 - the After all visible residue has been removed, wet surface and scrape off 1/16" of scratch coat into pan.
 - a Frequently empty pan into asbestos disposal bag.
- 16) Drill a starter hole at each comer of fixture using a drill equipped with a dust collection collar attached to an operating HEPA vacuum.
- 17)Use a pneumatic shear or large tin snips to cut through scratch coat and wire lath on all sides of light fixture.
- 18) Drop down light fixture, disconnect electrical and coil above ceiling.
 - tt Wrap cut edged on light fixture with duct tape.
 - a Double bag in asbestos disposal bag and dispose of as asbestos waste.
- 19) Collect any surfacing debris from repair/replacement work using HEPA vacuum.
- 20) Apply a lockdown encapsulant, where required and as directed by the Competent Person, using an airless garden sprayer, to surfaces where ACM was removed or disturbed.

!Note: See Appendix C for detailed Lockdown/Encapsulation Procedures.I

- 21) Do not spray encapsulant on fireproofing or steel which fireproofing is to be applied without specific authorization from your supervisor. An inappropriate encapsulant could cause the freeproofing to fail and result in a life threatening situation.
- 22) Wet wipe or HEPA vacuum the underside of the panel which was moved.
- 23) Carefully replace ceiling panel.
- 24) Package and label asbestos waste for disposal.
 - a) Disposal bags should be collapsed by evacuating the air from the bag with the HEPA vacuum in the work area or enclosure.
 - b) Once collapsed, twist the bag to form a neck and wrap it tight with duct tape.
 - c) Fold neck of bag over to form a loop, then again wrap duct tape around neck and loop.



d) Place bag in decon.

Note: See Appendix B for specific labeling requirements.

- 25) Conduct visual inspection.
 - u The person performing the inspection must be a Competent Person.
- 26) Remove drop cloth and/or mini-enclosure and dispose as contaminated asbestos waste.
- 27) Clean tools, equipment, and work area using wet wiping and HEPA vacuuming as appropriate and return tools and equipment to outside work area.
- 28) HEPA vacuum coveralls
 - a) If two disposable coveralls are used:
 - u While wearing respirator, remove outer coveralls in work area
 - a Place coveralls in disposal bag
 - a Enter decon with disposal bag
 - n Remove remaining coveralls and place in disposal bag
 - b) If one set of coveralls are used:
 - ti While wearing respirator, HEPA vacuum coveralls while in work area
 - Enter decon and remove coveralls, place in disposal bag
 - c) Ifstreet clothes are contaminated
 - 12 HEPA vacuum while in decon
 - 11 Remove and place in disposal bag
 - 11 Clothes must be disposed of or cleaned as ACM
- 29) Complete personal air monitoring work.
 - a Stop pump
 - ti Remove cassette. Be sure to cap all openings
 - a Complete chain of custody and send to EH&S

- 30) Wash hands, face and respirator while standing in decon
 - 1:1 Use disposable towels and clean water
 - Wash hands, face and surface of respirator.

NOTE: DO NOT BREAK SEAL BETWEEN FACE AND RESPIRATOR

- 111 Place towels into disposal bag and seal.
- 31) At this point all waste will be double bagged before leaving decon.
- 32) Once all waste is double bagged remove respirator; cleaning and storing according to Respiratory Protection program
- 33) Return decontaminated tools, equipment, and remaining materials to storage area.
- 34) Remove lockout tags and restart HVAC/electrical system(s).
- 35) Restore normal accessibility to work area.
- 36) Transport waste to designated asbestos waste storage area.
 - Waste should be lifted and carried, or transported in wheeled carts, when moved from one area to another.
 - 15 DO NOT DRAG PACKAGED WASTE
 - **u** Packaged waste should be PLACED, NOT THROWN OR DROPPED into vehicles and storage areas
 - tr Lock all waste in West Virginia University's asbestos storage facility

S12

Cut or drill hole in surfacing ACM (Enclosure Recommended)**

Example

The following are examples of work that can be performed using the procedures of this work practice. If job conditions vary from the examples, stop work and notify your supervisor.

- a Drill or cut opening in wall into pipe or duct chase using tools with or without HEPA filtered dust collection in an enclosure.
- a Drill hole in ceiling to insert toggle bolt.
- a Remove acoustical plaster before drilling or cutting hole in ceiling/wall

Buildings

The following buildings are examples where these work practices can be applied.

- a Summit Hall
- a Law Center

Guidelines

- **a** Two or more Asbestos workers are required to complete the scope of this work practice.
- a This work practice covers the work required to cut or drill a hole through surfacing ACM, such as acoustical plaster. If possible, ACM should be removed before holes are drilled. If holes are drilled in an ACM wall surface with a cavity behind the wall, workers should note that other ACM might be present in the cavity.

Notes

Negative pressure containments shall be constructed for this procedure, **unless, the erection or installation of a containment is likely to cause more disturbance to the ACM which may result in asbestos fiber release and unnecessary exposure to the worker. If an enclosure cannot be installed, contact the asbestos program manager for alternative work procedures.

This work practice is for individual small maintenance activities where the anlount of debris involved can be contained in one 60"by 60" disposal bag. It is standard industry practice not to fill these bags more than one-third full, to allow for proper sealing and to guard against breakage. If more than this amount of debris is found, stop work, close ceiling, and notify your supervisor.

Work Procedures

- 1) Obtain and review a copy of the work order and schedule for work.
- 2) The following is a checklist of tools, equipment, and materials recommended to perform the steps outlined below.

Tools, Equipment, and Materials

Utility knife Disposal bags with labels

GFCI's HEPA vacuum with attachments

Extension cords and adapters Respirators

Lockout tags Disposable coveralls

Temporary work lights Disposable towels or wet wipes

Ladder or scaffold for elevated work

Wet wipes or bucket with clean water

Asbestos barrier tape

Warning signs

Smoke test bulb and tubes Garden sprayer
Bone saw Amended water

Wire cutters

Tin snips

Lockdown encapsulant

Air monitoring equipment

Safety glasses

Glovebags (if required)

Safety glasses Glovebags (if required)
Polyethylene sheet Nylon Brush

Duct tape

In the event of a fiber release, see **Appendix D: Procedures for Fiber Release Episodes.**

- 3) Obtain required respirators. The minimum level of respirator for this procedure is a half face air-purifying respirator.
- 4) Move tools, equipment, and materials to work area.
- 5) Secure work area
 - a Vacate work area to prevent building occupant exposure
 - a Restrict work area using barrier tape, signage or partitions.

NOTE: Signage should read 'DANGER" or "KEEP OUT OF CONSTRUCTION AREA"

a In high occupancy areas, put up a secondary barrier to prevent unauthorized access to work area.

For example: Black plastic, plywood partitions, or locking all doors to work area.



6) Lockout electrical systems that may create a hazard during O&M activities.

NOTE: Lockout tags should note when and why power is shut down and the personnel performing the lockout. There should only be one key for each lock used on lockout tags to prevent accidental reactivation of equipment.

- 7) Pre-clean work area if visible dust or debris is present, using one or more of the following techniques.
 - a Pick up dust/debris with HEPA vacuum
 - a Wet wipe non-porous surfaces
 - a HEPA vacuum surfaces not able to be wiped
 - a Clean carpeting using steam cleaner or HEPA vacuum
- 8) The competent person will determine if the room is to be prepped or a mini enclosure is to be used. Follow (a) and (b) below for prepping the room, or (c) for using a mini enclosure.
 - a) Install critical barriers within work area
 - 11 Close all openings with sheet plastic at least 6 mil thick
 - r:t Duct tape all cracks
 - 11 Seal the following with duct tape and polyethylene sheets
 - **a** Air intakes and returns
 - a Light fixtures (being careful not to burn or melt plastic)
 - a Clocks
 - a Doorways
 - a Windows
 - a Convectors and speakers
 - a All other openings
 - 11 Maintain all seals until the decontamination step is completed.
 - b) Place a polyethylene drop cloth
 - Spread single layer on floor-be sure it covers an area large enough catch falling debris
 - a Stabilize sheet by using tape or weights
 - **u** Use caution not to tear plastic if working on soft flooring (carpet)

CAUTION: Drop cloth introduces a potential slip hazard;non-slip foot coverings are recommended



- c) Set up mini enclosure(s) when engineering and work practices are unable to control asbestos fiber release.
 - a Two workers are necessary to set up and perform work in minienclosures
 - a After enclosure is in place, check for, and clean up any debris generated by enclosure installation
 - a Use a HEPA vacuum to obtain negative pressure
- 9) Place tools, equipment, and materials needed into the enclosure. Include HEPA vacuum inside the enclosure for vacuuming areas above the ceiling.
- 10) Enter secured work area to put on protective clothing.

NOTE: DO NOT put on disposable Tyvex coveralls in public areas

- a Workers are required to wear appropriate PPE as directed by the competent person on site.
- 11) Air monitoring begins at this point.
- 12) Put on respirator and perform fit checks.
- 13) Ifaccess above a ceiling is required, obtain access using the appropriate O&M work practice.
- 14) Cut Hole through a Wall:
 - a) Inside of mini-enclosure, place polyethylene sheet below removal location to catch any falling debris.
 - b) Adequately wet area where hole is to be cut.
 - c) Remove ACM from entire area of hole and to at least "beyond where hole is needed."
 - d) Keep hose of an operating HEPA vacuum within 6" [150 mm] of where scraping is occurring.
 - e) Adequately wet any dust or debris generated. Cut hole through scraped area after ACM is removed.

- f) Drill small holes using a drill with dust collection collar attached to a HEPA vacuum.
- g) Maintain HEPA vacuum in operation during entire process of drilling holes.

15) Core Drill Through Deck:

- a) Inside of mini-enclosure, place polyethylene sheet below removal location to catch any falling debris.
- b) Adequately wet area where hole is to be cut.
- c) Remove ACM from entire area of hole and to at least Yi" beyond where hole is needed.
- d) Keep hose of an operating HEPA vacuum within 6"of where scraping is occurring.
- e) Adequately wet any dust or debris generated.
- f) Cut hole through scraped area after ACM is removed.
- g) Drill small holes using a drill with dust collection collar attached to a HEPA vacuum.
- h) Maintain HEPA vacuum in operation during entire process of drilling holes.
- 16)Let HEPA vacuum run for at least 15 minutes to clean air in enclosure.
- 17)Perform maintenance work.
- 18)Apply a lockdown encapsulant, where required and as directed by the Competent Person, using an airless garden sprayer, to surfaces where ACM was removed or disturbed.

Note: See Appendix C for detailed Lockdown/Encapsulation Procedures.

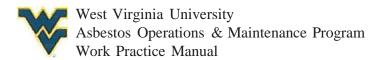
- 19)Do not spray encapsulant on fireproofing or steel which fireproofing is to be applied without specific authorization from your supervisor. An inappropriate encapsulant could cause the fireproofing to fail and result in a life threatening situation.
- 20) Wet wipe or HEPA vacuum the underside of the panel which was moved.



- 21) Carefully replace ceiling panel.
- 22) Package and label asbestos waste for disposal.
 - a) Disposal bags should be collapsed by evacuating the air from the bag with the HEPA vacuum in the work area or enclosure.
 - b) Once collapsed, twist the bag to form a neck and wrap it tight with duct tape.
 - c) Fold neck of bag over to form a loop, then again wrap duct tape around neck and loop.
 - d) Place bag in decon.

Note: See Appendix B for specific labeling requirements.

- 23) Conduct visual inspection.
 - n The person performing the inspection must be a Competent Person.
- 24) Remove drop cloth and/or mini-enclosure and dispose as contaminated asbestos waste.
- 25) Clean tools, equipment and work area using wet wiping and HEPA vacuuming as appropriate and return tools and equipment to outside work area.
- 26) HEPA vacuum coveralls
 - a) If two disposable coveralls are used:
 - n While wearing respirator, remove outer coveralls in work area
 - a Place coveralls in disposal bag
 - a Enter decon with disposal bag
 - a Remove remaining coveralls and place in disposal bag
 - b) If one set of coveralls are used:
 - a While wearing respirator, HEPA vacuum coveralls while in work area
 - u Enter decon and remove coveralls, place in disposal bag
 - c) If street clothes are contaminated
 - u HEPA vacuum while in decon



- 11 Remove and place in disposal bag
- 11 Clothes must be disposed of or cleaned as ACM
- 27) Complete personal air monitoring work.
 - t1 Stop pump
 - ii Remove cassette. Be sure to cap all openings
 - 11 Complete chain of custody and send to EH&S
- 28) Wash hands, face and respirator while standing in decon
 - use disposable towels and clean water
 - Wash hands, face and surface ofres irator.

NOTE: DO NOT BREAK SEAL BETWEEN FACE AND RESPIRATOR

- 11 Place towels into disposal bag and seal.
- 29) At this point all waste will be double bagged before leaving decon.
- 30) Once all waste is double bagged remove respirator; cleaning and storing according to Respiratory Protection program
- 31) Return decontaminated tools, equipment and remaining materials to storage area.
- 32) Remove lockout tags and restart RVAC/electrical system(s).
- 33) Restore normal accessibility to work area.
- 34) Transport waste to designated asbestos waste storage area.
 - Waste should be lifted and carried, or transported in wheeled carts, when moved from one area to another.
 - ti DO NOT DRAG PACKAGED WASTE
 - a Packaged waste should be <u>PLACED</u>, NOT THROWN OR DROPPED, into vehicles and storage areas
 - to Lock all waste in West Virginia University's asbestos storage facility

Replace bulbs in light fixture attached to or in surface finished with ACM (No Disturbance)

Example

The following are examples of work that can be performed using the procedures of this work practice. If job conditions vary from the examples, stop work and notify your supervisor.

a Replace bulbs in recessed or pendant mount light fixtures attached to an asbestoscontaining decorative texture finish or acoustical plaster ceiling ingood condition where the material may be contacted, but it is unlikely that any debris will be released.

Buildings

The following buildings are examples where these work practices can be applied.

- 1:1 Admissions and Records
- a Percival Hall

Guidelines

- a Generally personnel with asbestos awareness training can complete this work practice.
- a This work practice covers the procedures for replacing light bulbs in a fixture attached to a surface finished with ACM. Light fixtures attached to or in surfaces finished with ACM can cause damage to ACM if the fixtures are moved during maintenance work.
- a This work practice assumes that the ACM is going to be contacted during the work, but not disturbed. If the worker suspects that disturbance to the ACM ceiling may occur during completion of this task, a Competent Person must evaluate the work to determine if it must be conducted by an Asbestos trained employee.

Work Procedures

- 1) Obtain and review copies of work order and schedule work.
- 2) The following is a checklist of tools, equipment, and materials recommended to perform the steps outlined below.

Tools, Equipment, and Materials

GFCI's
Extension cords and adapters
Lockout tags
Temporary work lights
Ladder or scaffold for elevated work
Flashlight
Safety glasses

In the event of a fiber release, see **Appendix D: Procedures for Fiber Release Episodes.**

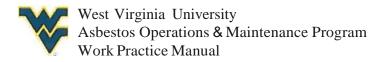
- 3) Move tools, equipment, and materials to work area.
- 4) Secure work area
 - a Vacate work area to prevent building occupant exposure
 - **a** Restrict work area using barrier tape, signage, or partitions.

NOTE: Signage should read 'DANGER' or 'KEEP OUT OF CONSTRUCTION AREA"

a In high occupancy areas, put up a secondary barrier to prevent unauthorized access to work area.

For example: Black plastic, plywood partitions, or locking all doors to work area.

- 5) Place ladder or scaffold in work area.
- 6) Carefully replace light bulbs without jarring fixture or releasing debris.
 - a Ifdebris is inadvertently released stop work and notify supervisor.
- 7) Return tools, equipment, and remaining materials to storage area.
- 8) Notify supervisor that work is completed and complete documentation.



814

Clean room with exposed ACM surfacing material in good condition (No Disturbance)

Example

The following are examples of work that can be performed using the procedures of this work practice. If job conditions vary from the examples, stop work and notify your supervisor.

- Routine cleaning in room with spray-applied ACM acoustical plaster on walls or ceiling where there is no visible debris.
- a Routine cleaning in mechanical room with exposed ACM thermal system insulation in good condition where there is no visible debris.

Buildings

The following buildings are examples where these work practices can be applied.

- 1:1 Towers
- a Summit Hall

Guidelines

- Generally personnel with asbestos awareness training can complete this work practice.
- This work practice covers the procedures for cleaning a room with exposed surfaces finished with ACM. This room has been predetermined to not be contaminated or has previously been cleaned. However, debris could be released from the material by contact with occupants during normal occupation of the space. If the employee encounters dust or debris that is suspected to be asbestoscontaining, a Competent Person must evaluate the task to determine if an Asbestos trained worker is necessary to conduct the work.

Work Procedures

- 1) Tools, equipment and materials:
 - c Standard cleaning equipment and materials.
- 2) Clean area using standard and established cleaning methods.
 - **a** Avoid contact with any ACM materials that could be damaged during cleaning.
- 3) **DO NOT** clean up suspected asbestos debris.
 - n If as best os debris is found in a space, stop cleaning work in that space and notify your supervisor.
- 4) The following precautions should be observed when working around the ACM:
 - a) Do not bump ACM with vacuum cleaners, broom handles, mop handles or similar objects.
 - b) Do not exhaust vacuum cleaners toward ACM.
 - c) Do not brush ACM surfaces with a broom or similar objects to remove cobwebs or other items attached to ACM.

S15

Repair damaged surfacing ACM (No Disturbance)

Example

The following are examples of work that can be performed using the procedures of this work practice. If job conditions vary from the examples, stop work and notify your supervisor.

- Repair small hole inacoustical plaster ceiling or wall with non-ACM caulking without disturbing surrounding plaster.
- Repair small gouged area in asbestos-containing decorative texture finish without disturbing surrounding finish.

Buildings

The following buildings are examples where these work practices can be applied.

- 1:2 Towers
- 12 Summit Hall

Guidelines

Generally, the scope of this work practice can be completed by one Asbestos trained worker.

Work Procedures

- 1) Obtain and review copies of work order and schedule work.
- 2) The following is a checklist of tools, equipment, and materials recommended to perform the steps outlined below.

Tools, Equipment, and Materials

GFCI's
Extension cords and adapters
Lockout tags
Temporary work lights
Ladder or scaffold for elevated work
Flashlight
Safety glasses

In the event of a fiber release, see **Appendix D: Procedures for Fiber Release Episodes.**

- 3) Move tools, equipment, and materials to work area.
- 4) Secure work area
 - a Vacate work area to prevent building occupant exposure
 - a Restrict work area using barrier tape, signage, or partitions.

NOTE: Signage should read 'DANGER' or 'KEEP OUT OF CONSTRUCTION AREA"

the In high occupancy areas, put up a secondary barrier to prevent unauthorized access to work area.

For example: Black plastic, plywood partitions, or locking all doors to work area.

- 5) Repair damaged area using non-ACM caulking without disturbing ACM.
 - **a DO NOT** scrape or sand existing ceiling.
- 6) Return tools, equipment, and remaining materials to storage area.
- 7) Notify supervisor that work is completed and complete documentation.



816

Repair damaged surfacing ACM (Enclosure Recommended)**

Example

The following are examples of work that can be performed using the procedures of this work practice. If job conditions vary from the examples, stop work and notify your supervisor.

- c Install fire rated enclosure over small area of damaged fireproofing.
- a Apply fireproofing to repair small water damaged area.
- a Repair a small area of delaminated plaster.

Buildings

The following buildings are examples where these work practices can be applied.

- a Towers
- c Summit Hall

Guidelines

a Two or more Asbestos workers are required to complete the scope of this work practice.

Notes

Negative pressure containments shall be constructed for this procedure, **unless, the erection or installation of a containment is likely to cause more disturbance to the ACM which may result in asbestos fiber release and unnecessary exposure to the worker. If an enclosure cannot be installed, contact the asbestos program manager for alternative work procedures.

This work practice is for individual small maintenance activities where the amount of debris involved can be contained in one 60" by 60" disposal bag. It is standard industry practice not to fill these bags more than one-third full, to allow for proper sealing and to guard against breakage. If more than this amount of debris is found, stop work, close ceiling, and notify your supervisor.

Work Procedures

- 1) Obtain and review a copy of the work order and schedule for work.
- 2) The following is a checklist of tools, equipment, and materials recommended to perform the steps outlined below.

Tools, Equipment, and Materials

Utility knife Disposal bags with labels

GFCl's HEPA vacuum with attachments

Extension cords and adapters Respirators

Lockout tags Disposable coveralls

Temporary work lights Disposable towels or wet wipes

Ladder or scaffold for elevated work

Asbestos barrier tape

Wet wipes or bucket with clean water Warning signs

Smoke test bulb and tubes Garden sprayer
Bone saw Amended water

Wire cutters

Tin snips

Air monitoring equipment
Safety glasses

Glovebags (if required)

olyethylene sheet

Nylon Brush

Polyethylene sheet Nylon Bru
Duct tape

In the event of a fiber release, see **Appendix D: Procedures for Fiber Release Episodes.**

- 3) Obtain required respirators. The minimum level of respirator for this procedure is a half face air-purifying respirator.
- 4) Move tools, equipment, and materials to work area.
- 5) Secure work area
 - Nacate work area to prevent building occupant exposure
 - Restrict work area using barrier tape, signage or partitions.

NOTE: Signage should read 'DANGER' or 'KEEP OUT OF CONSTRUCTION AREA"

a In high occupancy areas, put up a secondary barrier to prevent unauthorized access to work area.

For example: Black plastic, plywood partitions, or locking all doors to work area.



6) Lockout electrical systems that may create a hazard during O&M activities.

NOTE: Lockout tags should note when and why power is shut down and the personnel performing the lockout. There should only be one key for each lock used on lockout tags to prevent accidental reactivation of equipment.

- 7) Pre-clean work area if visible dust or debris is present, using one or more of the following techniques.
 - c Pick up dust/debris with HEPA vacuum
 - Wet wipe non-porous surfaces
 - HEPA vacuum surfaces not able to be wiped
 - 111 Clean carpeting using steam cleaner or HEPA vacuum
- 8) The competent person will determine if the room is to be prepped or a mini enclosure is to be used. Follow (a) and (b) below for prepping the room or (c) for using a mini enclosure.
 - a) Install critical barriers within work area
 - 111 Close all openings with sheet plastic at least 6 mil thick
 - a Duct tape all cracks
 - a Seal the following with duct tape and polyethylene sheets
 - a Air intakes and returns
 - Light fixtures (being careful not to burn or melt plastic)
 - a Clocks
 - a Doorways
 - a Windows
 - 1:1 Convectors and speakers
 - a All other openings
 - a Maintain all seals until the decontamination step is completed.
 - b) Place a polyethylene drop cloth
 - a Spread single layer on floor -be sure it covers an area large enough catch falling debris
 - 11 Stabilize sheet by using tape or weights
 - **a** Use caution not to tear plastic if working on soft flooring (carpet)

CAUTION: Drop cloth introduces a potential slip hazard; non-slip foot coverings are recommended

- c) Set up mini enclosure(s) when engineering and work practices are unable to control asbestos fiber release.
 - n Two workers are necessary to set up and perform work in minienclosures
 - *u* After enclosure is in place, check for, and clean up any debris generated by enclosure installation
 - n Use a HEPA vacuum to obtain negative pressure
- 9) Place tools, equipment, and materials needed into the enclosure. Include HEPA vacuum inside the enclosure for vacuuming areas above the ceiling.
- 10) Enter secured work area to put on protective clothing.

<u>iNOTE</u>: <u>DO NOT put on disposable Tyvex coveralls in public areasl</u>

- n Workers are required to wear appropriate PPE as directed by the competent person on site.
- 11) Air monitoring begins at this point.
- 12) Put on respirator and perform fit checks.
- 13) Enter enclosure.
 - a) Adequately wet area of damaged surfacing using garden sprayer containing amended water.
 - b) Allow water to soak in for several minutes.
- 14) With HEPA vacuum within several inches of damaged area, remove any loose material by hand or with scraper.
 - a) Collect material in disposal bags as it is removed.
 - b) Remove material around edges of damaged area until well-adhered material is found.
 - c) DO NOT remove beyond area protected inside enclosure.
 - d) Mist removal area during removal of damaged material.
- 15)Repair damaged area using non-ACM materials.

16)Apply a lockdown encapsulant, where required and as directed by the Competent Person, using an airless garden sprayer, to surfaces where ACM was removed or disturbed.

Note: See Appendix C for detailed Lockdown/Encapsulation Procedures.

- 17)Do not spray encapsulant on fireproofing or steel which fireproofing is to be applied without specific authorization from your supervisor. An inappropriate encapsulant could cause the fireproofing to fail and result in a life threatening situation.
- 18) Wet wipe or HEPA vacuum the underside of the panel which was moved.
- 19) Carefully replace ceiling panel.
- 20) Package and label asbestos waste for disposal.
 - a) Disposal bags should be collapsed by evacuating the air from the bag with the HEPA vacuum in the work area or enclosure.
 - b) Once collapsed, twist the bag to form a neck and wrap it tight with duct tape.
 - c) Fold neck of bag over to form a loop, then again wrap duct tape around neck and loop.
 - d) Place bag in decon.

Note: See Appendix B for specific labeling requirements.

- 21) Conduct visual inspection.
 - a The person performing the inspection must be a Competent Person.
- 22) Remove drop cloth and/or mini-enclosure and dispose as contaminated asbestos waste.
- 23) Clean tools, equipment, and work area using wet wiping and HEPA vacuuming as appropriate and return tools and equipment to outside work area.
- 24) HEPA vacuum coveralls
 - a) If two disposable coveralls are used:
 - a While wearing respirator, remove outer coveralls in work area
 - a Place coveralls in disposal bag



- a Enter decon with disposal bag
- **u** Remove remaining coveralls and place in disposal bag
- b) Ifone set of coveralls are used:
 - u While wearing respirator, HEPA vacuum coveralls while in work area
 - 12 Enter decon and remove coveralls, place in disposal bag
- c) If street clothes are contaminated
 - n HEPA vacuum while in decon
 - a Remove and place in disposal bag
 - a Clothes must be disposed of or cleaned as ACM
- 25) Complete personal air monitoring work.
 - a Stoppump
 - a Remove cassette. Be sure to cap all openings
 - 1:1 Complete chain of custody and send to EH&S
- 26) Wash hands, face and respirator while standing in decon
 - **a** Use disposable towels and clean water
 - Wash hands, face and surface of respirator.

NOTE: DO NOT BREAK SEAL BETWEEN FACE AND RESPIRATOR

- a Place towels into disposal bag and seal.
- 27) At this point all waste will be double bagged before leaving decon.
- 28) Once all waste is double bagged remove respirator; cleaning and storing according to Respiratory Protection program
- 29) Return decontaminated tools, equipment, and remaining materials to storage area.
- 30) Remove lockout tags and restart HVAC/electrical system(s).
- 31) Restore normal accessibility to work area.
- 32) Transport waste to designated asbestos waste storage area.
 - *zi* Waste should be lifted and carried, or transported in wheeled carts, when moved from one area to another.
 - a DO NOT DRAG PACKAGED WASTE



- ti Packaged waste should be <u>PLACED</u>, NOT THROWN OR DROPPED, into vehicles and storage areas
- a Lock all waste in West Virginia University's asbestos storage facility

S17

Accessing through an ACM finished surface (No Disturbance)

Example

The following are examples of work that can be perfonned using the procedures of this work practice. If job conditions vary from the examples, stop work and notify your supervisor.

Open access door in acoustical plaster ceiling or wall. Ceiling or wall is in good condition and access door can be opened without disturbing ACM.

Buildings

The following buildings are examples where these work practices can be applied.

- a Agriculture Sciences Building
- tl Percival Hall

Guidelines

- Generally, only one trained asbestos worker is necessary to complete the scope of this work practice.
- a This work practice covers the procedures for opening access doors (such as those used in a wall or ceiling to access valves or dampers) in ACM finished surfaces such as acoustical plaster.
- a This work practice should only be used in situations where the ACM surface material is in good condition and will not be disturbed by the work.

Work Procedures

- 1) Obtain and review copies of work order and schedule work.
- 2) The following is a checklist of tools, equipment, and materials recommended to perform the steps outlined below.

Tools, Equipment, and Materials

GFCI's
Extension cords and adapters
Lockout tags
Temporary work lights
Ladder or scaffold for elevated work
Flashlight
Safety glasses

In the event of a fiber release, see **Appendix D: Procedures for Fiber Release Episodes.**

- 3) Move tools, equipment, and materials to work area.
- 4) Secure work area
 - a Vacate work area to prevent building occupant exposure
 - a Restrict work area using barrier tape, signage or partitions.

NOTE: Signage should read 'DANGER' or 'KEEP OUT OF CONSTRUCTION AREA"

In high occupancy areas, put up a secondary barrier to prevent unauthorized access to work area.

For example: Black plastic, plywood partitions, or locking all doors to work area.

- 5) Unlatch door and open carefully.
 - ^{t1} Be careful not to disturb ACM during process of opening access door.
- 6) Perform maintenance work required above or behind access door and slowly close door until it is secured in place.
- 7) Return tools, equipment, and remaining materials to storage area.
- 8) Notify supervisor that work is completed and complete documentation.



818

Accessing through an ACM finished surface (Enclosure Recommended)**

Example

The following are examples of work that can be performed using the procedures of this work practice. If job conditions vary from the examples, stop work and notify your supervisor.

- **u** Open access door that has surfacing material on flanges that will be disturbed when door is opened.
- ореп ceiling access door in acoustical plaster or fireproofed surface where ACM is in poor condition or ACM debris is present in areas behind door.

Buildings

The following buildings are examples where these work practices can be applied.

- 11 Agriculture Sciences Building
- 11 Percival Hall

Guidelines

- **a** Two or more Asbestos workers are required to complete the scope ofthis work practice.
- This work practice covers the procedures for opening access doors (such as those used in a wall or ceiling to access valves or dampers) in ACM finished surfaces such as acoustical plaster or fireproofing.

Notes

**Negative pressure containments shall be constructed for this procedure, <u>unless</u>, the erection or installation of a containment is likely to cause more disturbance to the ACM which may result in asbestos fiber release and unnecessary exposure to the worker. If an enclosure cannot be installed, contact the asbestos program manager for alternative work procedures.

This work practice is for individual small maintenance activities where the amount of debris involved can be contained in one 60"by 60" disposal bag. It is standard industry practice not to fill these bags more than one-third full, to allow for proper sealing and to guard against breakage. If more than this amount of debris is found, stop work, close ceiling, and notify your supervisor.

Work Procedures

- 1) Obtain and review a copy of the work order and schedule for work.
- 2) The following is a checklist of tools, equipment, and materials recommended to perform the steps outlined below.

Tools, Equipment, and Materials

Utility knife Disposal bags with labels

GFCI's HEPA vacuum with attachments

Extension cords and adapters Respirators

Lockout tags Disposable coveralls

Temporary work lights Disposable towels or wet wipes

Ladder or scaffold for elevated work

Wet wipes or bucket with clean water

Asbestos barrier tape
Warning signs

Smoke test bulb and tubes Garden sprayer

Bone saw Amended water
Wire cutters Lockdown encapsulant
Tin snips Air monitoring equipment
Safety glasses Glovebags (if required)

Polyethylene sheet Nylon Brush

In the event of a fiber release, see **Appendix D: Procedures for Fiber Release Episodes.**

- 3) Obtain required respirators. The minimum level of respirator for this procedure is a half face air-purifying respirator.
- 4) Move tools, equipment, and materials to work area.
- 5) Secure work area

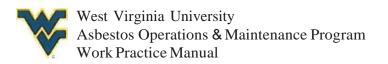
Duct tape

- a Vacate work area to prevent building occupant exposure
- a Restrict work area using barrier tape, signage, or partitions.

NOTE: Signage should read 'DANGER' or 'KEEP OUT OF CONSTRUCTION AREA'

c Inhigh occupancy areas, put up a secondary barrier to prevent unauthorized access to work area.

<u>For example</u>: Black plastic, plywood partitions, or locking all doors to work area.



6) Lockout electrical systems that may create a hazard during O&M activities.

NOTE: Lockout tags should note when and why power is shut down and the personnel performing the lockout. There should only be one key for each lock used on lockout tags to prevent accidental reactivation of equipment.

- 7) Pre-clean work area if visible dust or debris is present, using one or more of the following techniques.
 - Pick up dust/debris with HEPA vacuum
 - Wet wipe non-porous surfaces
 - HEPA vacuum surfaces not able to be wiped
 - a Clean carpeting using steam cleaner or HEPA vacuum
- 8) The competent person will determine if the room is to be prepped or a mini enclosure is to be used. Follow (a) and (b) below for prepping the room, or (c) for using a mini enclosure.
 - a) Install critical barriers within work area
 - a Close all openings with sheet plastic at least 6 mil thick
 - 11 Duct tape all cracks
 - a Seal the following with duct tape and polyethylene sheets
 - a Air intakes and returns
 - a Light fixtures (being careful not to bum or melt plastic)
 - tt Clocks
 - a Doorways
 - a Windows
 - a Convectors and speakers
 - # All other openings
 - a Maintain all seals until the decontamination step is completed.
 - b) Place a polyethylene drop cloth
 - a Spread single layer on floor-be sure it covers an area large enough catch falling debris
 - a Stabilize sheet by using tape or weights
 - tuse caution not to tear plastic ifworking on soft flooring (carpet)

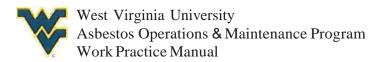
CAUTION: Drop cloth introduces a potential slip hazard; non-slip foot coverings are recommended



- c) Set up mini enclosure(s) when engineering and work practices are unable to control asbestos fiber release.
 - a Two workers are necessary to set up and perform work in minienclosures
 - **a** After enclosure is in place, check for, and clean up any debris generated by enclosure installation
 - a Use a HEPA vacuum to obtain negative pressure
- 9) Place tools, equipment, and materials needed into the enclosure. Include HEPA vacuum inside the enclosure for vacuuming areas above the ceiling.
- I0) Enter secured work area to put on protective clothing.

NOTE: DO NOT put on disposable Tyvex coveralls in public areas

- **a** Workers are required to wear appropriate PPE as directed by the competent person on site.
- **11)** Air monitoring begins at this point.
- 12) Put on respirator and perform fit checks.
- 13) Enter enclosure.
 - a) Remove any ACM surfacing material that may be disturbed when the access door is opened.
 - b) Remove enough material so that future use of the access door will not involve a disturbance to the ACM.
- 14) Wet any ACM on access door flanges that may be disturbed when door is opened.
 - a) Wet sufficiently so that ACM is wetted completely.
 - b) Allow amended water to soak into material so that ACM is wetted through to substrate in spot where ACM is to be removed.
- 15) If the surface is coated with paint then follow the procedures below.
 - a) Mist surface and scarify paint sufficiently for ACM to be wetted.
 - b) Remove paint by peeling or scraping off as necessary.
 - c) Wet surface of exposed ACM.
 - d) Allow amended water to soak into material so that ACM is wetted through to substrate in spot where ACM is to be removed.



- 16) Remove ACM surfacing material using one of the following procedures.
 - a) Scrape away surfacing material that will disturb when access door is opened.
 - Hold a pan immediately under area to catch debris while scraping.
 - 11 Ifany dry ACM is encountered stop scraping and wet ACM.
 - Maintain scraping area and any dust or debris generated wet at all times.
 - b) Scrape away surfacing material that will be disturbed when access door is opened.
 - Scrape material directly into the nozzle of an operating HEPA vacuum or use nozzle of HEPA vacuum directly as tool to remove ACM.
 - 11 Continuously maintain HEPA vacuum nozzle within 6" of where work is occurring.
 - 11 Ifany dry ACM is encountered stop scraping and wet ACM.
 - **a** Maintain scraping area and any dust or debris generated wet at all times.
- 17) Remove water and residue from surface with paper towels. Immediately dispose of towels in an asbestos waste bag.
- 18) Spray substrate and edges of acoustical plaster with clear penetrating encapsulant.
- 19) Apply a lockdown encapsulant, where required and as directed by the Competent Person, using an airless garden sprayer, to surfaces where ACM was removed or disturbed.

Note: See Appendix C for detailed Lockdown/Encapsulation Procedures.

- 20) Do not spray encapsulant on fireproofing or steel which fireproofing is to be applied without specific authorization from your supervisor. An inappropriate encapsulant could cause the fireproofing to fail and result in a life threatening situation.
- 21) Wet wipe or HEPA vacuum the underside of the panel which was moved.
- 22) Carefully replace ceiling panel.
- 23) Package and label asbestos waste for disposal.
 - a) Disposal bags should be collapsed by evacuating the air from the bag with the HEPA vacuum in the work area or enclosure.



- b) Once collapsed, twist the bag to form a neck and wrap it tight with duct tape.
- c) Fold neck of bag over to form a loop, then again wrap duct tape around neck and loop.
- d) Place bag in decon.

Note: See Appendix B for specific labeling requirements.

- 24) Conduct visual inspection.
 - *u* The person performing the inspection must be a Competent Person.
- 25) Remove drop cloth and/or mini-enclosure and dispose as contaminated asbestos waste.
- 26) Clean tools, equipment and work area using wet wiping and HEPA vacuuming as appropriate and return tools and equipment to outside work area.
- 27) HEPA vacuum coveralls
 - a) If two disposable coveralls are used:
 - *u* While wearing respirator, remove outer coveralls in work area
 - u Place coveralls in disposal bag
 - n Enter decon with disposal bag
 - 11 Remove remaining coveralls and place in disposal bag
 - b) If one set of coveralls are used:
 - u While wearing respirator, HEPA vacuum coveralls while in work area
 - u Enter decon and remove coveralls, place in disposal bag
 - c) Ifstreet clothes are contaminated
 - u HEPA vacuum while in decon
 - n Remove and place in disposal bag
 - n Clothes must be disposed of or cleaned as ACM
- 28) Complete personal air monitoring work.
 - n Stoppump
 - Remove cassette. Be sure to cap all openings
 - u Complete chain of custody and send to EH&S



- 29) Wash hands, face and respirator while standing in decon
 - **a** Use disposable towels and clean water
 - a Wash hands, face and surface of respirator.

NOTE: DO NOT BREAK SEAL BETWEEN FACE AND RESPIRATOR

- II Place towels into disposal bag and seal.
- 30) At this point all waste will be double bagged before leaving decon.
- 31) Once all waste is double bagged remove respirator; cleaning and storing according to Respiratory Protection program
- 32) Return decontaminated tools, equipment, and remaining materials to storage area.
- 33) Remove lockout tags and restart RVAC/electrical system(s).
- 34) Restore normal accessibility to work area.
- 35) Transport waste to designated asbestos waste storage area.
 - **II** Waste should be lifted and carried, or transported in wheeled carts, when moved from one area to another.
 - DO NOT DRAG PACKAGED WASTE
 - Packaged waste should be <u>PLACED</u>, NOT THROWN OR DROPPED, into vehicles and storage areas
 - Lock all waste in West Virginia University's asbestos storage facility

Painting surfacing ACM (No Disturbance)

Example

The following are examples of work that can be performed using the procedures of this work practice. If job conditions vary from the examples, stop work and notify your supervisor.

a Repaint previously painted ACM acoustical plaster wall or ceiling in good condition. No preparation (e.g., sanding) of the surface is required.

Buildings

The following buildings are examples where these work practices can be applied.

- a Towers
- a Law Center

Guidelines

a Generally, the scope of this work practice can be completed by personnel with asbestos awareness training.

Work Procedures

- 1) Obtain and review copies of work order and schedule work.
- 2) The following is a checklist of tools, equipment, and materials recommended to perform the steps outlined below.

Tools, Equipment, and Materials

GFCI's
Extension cords and adapters
Lockout tags
Temporary work lights
Ladder or scaffold for elevated work
Flashlight
Safety glasses

In the event of a fiber release, see **Appendix D: Procedures for Fiber Release Episodes.**

- 3) Move tools, equipment, and materials to work area.
- 4) Secure work area
 - Vacate work area to prevent building occupant exposure
 - n Restrict work area using barrier tape, signage, or partitions.

NOTE: Signage should read 'DANGER" or 'KEEP OUT OF CONSTRUCTION AREA"

In high occupancy areas, put up a secondary barrier to prevent unauthorized access to work area.

For example: Black plastic, plywood partitions, or locking all doors to work area.

- 5) Place ladder or scaffold in work area.
- 6) Paint ceiling or wall using sprayer or rollers.
 - a Ifrollers are used, try to contact each area of the ceiling only once to minimize potential damage to ACM.
- 7) Return tools, equipment, and remaining materials to storage area.
- 8) Notify supervisor that work is completed and complete documentation.



Appendix A

Mini-Enclosures and Negative Pressure Systems

Mini-Enclosures

Note: Enclosures are not to be used in as a substitute for engineering controls and good work practices. Controls and practices such as wetting of asbestos materials, careful handling, collection of debris/residue by HEPA vacuum, and local exhaust ventilation should be the primary means for control of fiber release during O&M work. Minienclosures are intended to protect the environment. Workers are protected by work procedures and engineering controls that prevent elevated airborne fiber levels, and by respiratory protection, protective clothing, decontamination procedures and other worker protection methods.

It is sometimes appropriate to extend mini-enclosures above ceilings, such as by using polyethylene sheet and framing taped together to provide enclosure around the work area. The mini-enclosure should not contact ACM covered surfaces. The construction will vary depending on whether the enclosure will be attached to pipes, conduit, metal hangers, or some other form of existing construction.

There are a variety of commercially-available types of mini-enclosures, including prefabricated pop-up boxes and adjustable framework assemblies to permit different sizes of enclosures to be constructed. Disposable liners for mini-enclosures (to facilitate set up and dismantling of the enclosure) are available from some manufacturers. It is often beneficial to construct or purchase a portable mini-enclosure unit that works for the typical conditions found in a given facility.

Two workers are necessary to set up and perform work in mini-enclosures. To construct a mini-enclosure, erect a framework of wood, PVC piping or metal framing that will enclose the work area and be large enough for at least one person to work inside. The width and depth of the enclosure should be at least 3 feet (1 meter). The height of the enclosure will vary depending upon the work to be performed and the height of the work area. A larger enclosure is preferable where space permits. However, if the enclosure is too large, the final cleaning process will require more effort. A mini-enclosure can include a separate 3 foot by 3 foot by 7 foot (1 x 1 x 2.1 meters) change room, with curtain doorways, attached to the mini-enclosure for changing and removing protective clothing.

If an entire room will be enclosed for performing work, the framework is usually not necessary, unless wall surfaces will be damaged by tape or adhesive used to support

polyethylene. A room can be enclosed for O&M work by installing one layer of polyethylene sheet on the walls and floor of the room.

If the work to be performed is an elevated location, the enclosure (and change room, if used) should be erected on a scaffold platform large enough to support the enclosure, change room (if used), and a step off area outside the enclosure.

Cover the floor and the framework for the enclosure and change room with one layer of polyethylene attached with duct tape. A second layer of polyethylene laid on the floor will facilitate clean up work, and reduce the possibility of tearing the polyethylene if equipment is used (do not use two layers under the legs of ladders). Construct curtain doorways between the change room and the enclosure and between the change room and the area outside the change room. A curtain doorway is made of three overlapping sheets of polyethylene. Attach sheets to framework at top and one side. The middle sheet should be attached on one side, and the inner and outer sheets attached on the other side. A sheet of polyethylene approximately 5 feet by 5 feet (1.5 meters by 1.5 meters) or larger should be installed outside the change room for use a step off area and as a place to put decontaminated materials removed from the work area.

Mini-enclosures should be constructed with a ceiling of polyethylene if work will not be performed above the enclosure. Ifwork is to be performed above the enclosure and the ceiling is not ACM, the enclosure should extend to and be sealed to the ceiling or grid system. If the enclosure is below an ACM finished surface, use one of the following methods:

- a If ACM cannot be contacted, the enclosure should be separated from the ceiling by a narrow space.
- a IfACM will withstand contact without damage and is in good condition, foam tape (1" (25 mm) or thicker) can be placed on the top edge of the enclosure. Gently lift enclosure into place until sufficient contact is made to provide a seal to the surface.
- a After enclosure is in place, check for, and clean up any debris generated by enclosure installation.
- a Mini-enclosures should be set up with a negative pressure system as described below to reduce the possibility of fibers being released from the enclosure and to filter the air inside the enclosure.

Negative Pressure System and HEPA Filtered Local Exhaust Ventilation:

Note: Certain configurations of negative pressure systems (pressure differential systems) are covered by patents. The APM should review applicable patent information regarding use of these systems. This manual uses the term "negative pressure system" as a synonym for "pressure differential system".

Mini-enclosures should be provided with a negative pressure system to reduce the possibility of fibers being released from the enclosure during the work, and to filter inside air discharged from the enclosure. Negative pressure inside mini-enclosures is commonly provide by a High Efficiency Particulate Air (HEPA) filtered vacuum or by HEPA-filtered negative pressure machines, depending upon the size of the enclosure. A HEAP vacuum will usually provide sufficient negative pressure for a small enclosure. Larger enclosures might require a small negative pressure machine to achieve a negative pressure inside the enclosure.

A negative pressure system for a mini-enclosure most commonly locates the HEPA vacuum or negative pressure machine outside the enclosure. The intake side of the unit is ducted to the enclosure through the vacuum hose or flexible duct material taped to a hole in the enclosure on the side opposite form the change room or as close as possible to where the work will be performed. The filtered exhaust side of the unit should be ducted to the outside of the building if possible. However, most vacuum units do not provide a connection for an exhaust duct, and are commonly exhausted inside the building. Additional protection might be desired for an area where air is exhausted inside a building. A work practice is provided for changing filters in HEPA vacuums and negative pressure machines (HEPA filtered exhaust fans) when needed. Filters should not be changed without following these work practices.

When HEPA-filtered local exhaust ventilation is used in a work practice, this can be in addition to, or in place of, a negative pressure system. A HEPA filtered local exhaust ventilation system might replace a negative pressure system if the ventilation system provides adequate negative pressure in the work area. Some work practices use HEPA-filtered local exhaust ventilation for fiber control where an enclosure is not used. A HEAP ventilation system can use a HEPA vacuum or negative pressure machine. The hose attached to the HEPA unit should be kept as close as possible to the location where ACM might be, or is, disturbed.

Appendix B

Asbestos Waste Labeling Requirements

All waste must be labeled as required by federal, state and local regulations. Federal regulations requiring labeling of waste include OSHA regulations 29 CFR 1910.1001 and 1926.1101, EPA's NESHAP regulation 40 CFR 61.160, and the Department of Transportation's Hazardous Materials Regulations 49 CFR 171 and 180. ACM packaging, with some exceptions, must meet general DOT and EPA requirements and be protective, marked and labeled. Review current labeling requirements with asbestos program manager (APM) and disposal site. The OSHA requirements apply regardless of the amount of waste or measured exposure levels (see 29 CFR 1926.1101(k)).

a Label Requirements Include:

OSHA **29** *CFR* **19261JOJ**{*k*)(8) *requirement:*

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

<u>DOT'S</u> shipping paper and marking format, used with some exceptions is:

R.Q.ASBESTOS Class 9 NA 2212, III

<u>NESHAP</u> requires that readily visible and legible warning labels as specified by OSHA be used on waste containers or wrapped materials (this is same as the OSHA 29 CFR 1926.1101 label listed above). Waste material to be transported off the facility site must also be labeled with the name of the waste generator (WVU) and the location(building or site name) at which the waste was generated.

<u>OSHA</u> requires leak-tight containers and labeling for Class Ilmaterials (Note that under the EPA NESHAP regulation these are Category I and II materials which are not regulated as long as the materials remain non-friable). For purposes of this O&M program, treat OSHA Class Ilmaterials as EPA regulated waste. Maintain OSHA required labels in place and dispose of as asbestos-containing waste in accordance with the NESHAP regulation.

Appendix C

Lockdown/Encapsulation Procedures

Lockdown encapsulants used during asbestos removal operations should be tested per 1978 Battelle/EPA report "Tests for the Evaluation of Encapsulants for Friable Asbestos-Containing Materials". Encapsulants should be water resistant after curing and be Class "A"fire-rated per ASTM 84-81A "Standard Method for Surface Burning Characteristics of Building Materials".

Encapsulants must be compatible with any materials that will be installed over the encapsulant. Note that many lockdown encapsulants will act as an adhesive and could be objectionable on some surfaces when dry. Care should be taken to avoid getting encapsulant on or in HVAC units, HEPA vacuums, and negative pressure machines.

The lockdown encapsulant is typically applied for O&M work using an airless garden sprayer. It should be applied in accordance with the manufacturer 's recommendations in two light coats sprayed from opposite directions to seal all portions of surfaces including any exposed edges of remaining ACM.

DO NOT APPLY LOCKDOWN ENCAPSULANT ON FIREPROOFING OR TO STEEL THAT IS GOING TO BE FIREPROOFED, WITHOUT PRIOR APPROVAL FROM THE SUPERVISOR. The use of spray fireproofing is based on full-scale fire endurance tests of fireproofed steel. Anything that differs from the tested assembly voids the test, and could result in a fireproofing failure. Fireproofing is a non-combustible insulator of steel. Coating it or saturating it with an encapsulant could render it combustible and could reduce its insulating properties. This could cause the fireproofing to fail and as such, voids the fire rating. The introduction of an encapsulant between the fireproofing and the steel could cause the bond of the fireproofing to the steel to weaken causing the fireproofing to fall off, or the encapsulant could be softened and allow the fireproofing to fall off during a fire. Unless the encapsulant has been tested and approved for use by the manufacturer of the fireproofing used, its use will void the fire rating of the fireproofing material.

Appendix D

Procedures for Fiber Release Episodes

O&M Emergency Response Procedures

Ifever an asbestos fiber release occurs in a WVU building, Environmental Health and Safety (EHS) shall be notified at 304-293-3792.

A fiber release episode by OSHA definition is any uncontrolled or unintentional disturbance of ACM resulting in visible emissions.

Special procedures are generally followed to minimize the spread of fibers throughout the building after asbestos fiber releases occur, such as the partial collapse of an ACM ceiling or wall. According to EPA regulations for schools a "major fiber release" is one involving more than three square or linear feet of ACM. The procedures to be followed will vary according to the site of the major release episode, the amount of ACM affected, the extent of fiber release from the ACM, the relationship of the release area to the air handling systems, and whether the release site is accessible to building occupants. Depending on the severity of the episode, EHS, asbestos abatement consultants, and contractors may be helpful in developing a strategy for conducting the cleanup operations.

It is important to recognize that different levels of training may be needed for workers involved with fiber release episodes. The degree of training considered appropriate for dealing with the cleanup of a major release needs to be a licensed asbestos abatement worker.

There are two classes of fiber release episodes-minor and major.

Minor Release Episodes

Minor fiber release episodes are for example the falling or dislodging of less than three (3) square or linear feet of friable ACM; the procedures for response are as described below:

- 1. Notify EHS,
- 2. Thoroughly saturate the debris using wet methods,
- 3. Clean the area,
- 4. Place the asbestos debris in appropriate sealed, leak-tight container
- 5. Repair the area of damaged ACM with appropriate materials such as; spackling, plaster, cement, or insulation or seal with encapsulation, and

6. Properly dispose of asbestos debris.

Major Release Episodes

A major fiber release episode is the falling or dislodging of more than three (3) square or linear feet of friable ACBM; the procedures for response are as described below:

- 1. Restrict entry into the area and post signs to prevent entry into the area by persons other than those necessary to perform the response action; Shut off or temporarily modify the air-handling system to prevent the distribution of fibers to other areas in the building.
 - In general, for major fiber releases, the area should be isolated by closing doors and/or erecting temporary barriers to restrict airflow as well as access to the site. Signs should be posted as necessary, immediately outside the fiber release site to prevent persons not involved in the cleanup operation from inadvertently entering the area. Ifasbestos fibers could enter the HVAC system, the system should be modified to prevent fiber entry, or should be shut down and sealed off.
- 2. Notify EHS
- 3. The response action for any major fiber release episode must be designed by an accredited Project Designer and conducted by persons accredited to conduct response actions.
- 4. After clean-up final air clearance monitoring shall be conducted and kept on record with EHS

NOTE: HEPA vacuuming, wet wiping, and worker protection procedures outlined in this O&M document, as well as wetting ACM wastes and properly placing them in an appropriate leak-tight container (such as a properly labeled, 6-mil-thick plastic bag), are examples of some of the procedures that could be used for both major and minor fiber releases.

All minor or major fiber-releases must be documented and reported to EHS at 304-293-3792.